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As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Donn Robert Grenda entitled Site Structure, Settlement Systems, and Social Organization at Lake Elsinore, California and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

David Allick
Date

Henry C. Koerper
Date

Michael B. Schiffer
Date

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director Michael B. Schiffer
Date
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Donn R. Kenda
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DEDICATION

To my family, co-workers, and friends who contributed to the success of this report.
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ABSTRACT

This report documents excavations at the Elsinore site (CA-RIV-2798/H) which is located at the mouth of the outlet channel on the northeast side of Lake Elsinore, Riverside County, California. Lake Elsinore is one of the only natural lakes in southern California, and is located at the eastern base of the Peninsular Range at the terminus of the San Jacinto River. Following the methodological approach of behavioral archaeology, this report explains how changes in lake level affected the lives of the people that lived on its shores. Identifying changes in site structure in relationship to the natural environment provides one of the keys to the interpretation of the lacustrine adaptations that took place over the past 8,000 years.

One of the most important aspects of the site is that it holds cultural remains representing the entire prehistory of the region in a stratified context. A total of 138.45 m$^3$ of fill was excavated from 27 units in deposits nearly three meters deep. Excavations revealed a large flaked stone assemblage including bifaces, unifaces, projectile points, flake tools, and 19 crescents; a variety of ground stone artifacts are present as well. Distributional covariation of artifact and ecofact classes serves as the basis for intrasite comparisons and the overall interpretation of the site. The interpretation addresses issues such as site function, activity areas, and the effect of differing lake levels on the inhabitants.

The presence of a stable lake during a time of climatic instability was probably the main factor that drew people to its shores. Initially these people were organized as small
bands that moved throughout the area as resources became available in different environmental zones. However, during the early to middle Holocene transition we see a change in settlement structure associated with a social organizational shift to a family based society. Although investigations revealed a late Holocene occupation at the site, the structure of the site at this time is fundamentally different from the earlier periods and failed to produce data necessary to allow for comparable discussion of social change during the late Holocene.
CHAPTER 1

INTRODUCTION

The lake - Etengvo Wumoma to the Indians, Laguna Grande to the Mexicans, and Lake Elsinore to Americans - has always been a source of pleasure. But at times it has also been a source of grief and discomfort. Yet the lake is here. Nature put it here and here it no doubt will always be - at times a blessing and at times a problem. Perhaps one of its greatest attributes has been as a character builder; for it has presented a challenge to all of those who live on its shores...

-Tom Hudson, 1978

Hudson's description of life on the shores of Lake Elsinore is probably more appropriate for the archaeology of the area than he could have imagined, for it accurately portrays the last 8,500 years of occupation at the Elsinore site (CA-RIV-2798/H, hereafter the prefix CA and the suffix H are dropped). In fact, the project on which this dissertation is based went to great lengths to demonstrate how important an understanding of the changes in the lake is to the study of the relationship between material culture and the human behavior that created it (Grenda 1997). Although the Elsinore site has many unique aspects that make it an attractive settlement location, the presence of a stable lake during a time of climatic instability was probably the main factor that drew people to its shores.

Lake Elsinore, one of the few natural lakes in southern California, is located at the eastern base of the Peninsular Range at the terminus of the San Jacinto River (Figure 1). With its headwaters in the San Jacinto Mountains, the river drains 717 square miles as it flows toward the lake and out through Warm Springs Creek, the Temescal Wash, and the
Santa Ana River as it makes its way to the coast (Figure 2). These distinct physiographic units host a diverse set of environmental resources, ranging from pine and oak forests, to lacustrine, riparian, and estuarine communities. In addition to a stable water supply and a diverse set of terrestrial floral and faunal species, the local area contains abundant high quality lithic resources, hot springs that were significant to the Late Prehistoric peoples and probably earlier groups, and fish, waterfowl, and other aquatic resources that became increasingly scarce with climatic warming during the Holocene. As a result of this unique setting, people found the site attractive since their initial entry into the region nearly 10,000 years ago, presumably moving throughout the area as resources became available in the different environmental zones (Altschul and Grenda 1995).

California archaeologists studying the earliest human adaptive patterns have failed to focus their attention on the inland valley setting. Instead, debates surrounding the early Holocene are based on data gathered from sites near the shores of pluvial lakes of the Mojave Desert and from coastal Santa Barbara and San Diego Counties. Systematic archaeological work has been conducted in these regions since the 1950s and interpretations concerning chronology and culture process for southern California are biased in these directions. The story of prehistory thus overlooks the adaptative strategies of groups that lived between the coast and deserts. This study focuses on the southern California intermediate valleys between the Peninsular and Transverse ranges and it is here that I hope these investigations will shed light.
In addition to this geographic focus, one of the most important aspects of the site is that it holds cultural remains representing the entire prehistory of the region in a stratified context. Using data from major lithic analyses (Towner et al. 1997), faunal analyses (Strand 1997a), micro- and macrobotanical studies (Grenda and Hogan 1997), geomorphological reconstructions and interpretations of site stratigraphy and soils (Homburg and Ferraro 1997) provides new insights into lithic procurement strategies, technological change, subsistence and settlement patterns, and prehistoric economic and social systems. Working from a behavioral perspective (Schiffer 1976), this investigation is focused on the relationships between human behavior and material culture to reexamine some of the main issues plaguing California archaeologists. The data presented in this report and the evaluation of the methods commonly used to approach similar data not only contribute to an understanding of a small group of foragers living on the shores of Lake Elsinore but also provide a fresh look at regional trends from people's earliest entry into the area to the Late Prehistoric period.
Figure 1. Map of southern California showing site location.
Figure 2. The San Jacinto and Santa Ana River basins.
Beyond the archaeological record, the site area is steeped in ethnohistory. Both the hot springs, located about 200 meters north of the site, and the Lake are named locations in both the Juaneño and Luiseño languages (DuBois 1908:134; Harrington 1978; O'Neil and Evans 1980) and Kroeber (1925:Plate 57) places the village of Paiahche immediately north of the lake. Lake Elsinore was known to the Juaneño as Paayactci, whereas the Luiseño name for the lake was Paahashnan. The area around and including the Elsinore hot springs was known to the Luiseño as 'Atengvo (meaning hot springs). The hot springs also figure prominently in the local creation myth. The location, Itengvu Wumowmu, is named in a song about the death of Wiyot, a religious leader who led the people in their migration from the north. When Wiyot was dying, the people took him to a number of hot spring locations throughout the region in a effort to cure him. The last of these locations was the Elsinore hot springs, and it was there that Wiyot died (DuBois 1908:134; Harrington 1978:199).

These investigations of the Elsinore site failed to produce a large Late period artifact assemblage as may be expected at a site that figures prominently in the ethnographic record. Why is this so? A number of hypotheses come to mind: 1) the place name refers to the general location but does not imply the presence of an archaeological site; 2) we did not excavate on the site associated with the village of Paiahche or the place name Itengvu Wumowmu; 3) we excavated on the named site but, due to a number of formation processes, either the majority of the site was destroyed or the deposits were no longer recognizable; 4) we excavated the named site and found deposits consistent with the ethnographic record; or 5) we excavated on the site and found deposits that are inconsistent
with the ethnographic record. Using the data generated by the project (Grenda and Hogan 1997; Homburg and Ferraro 1997; Strand 1997a, 1997b; Towner et al. 1997), these hypotheses are explored in detail in Chapter 5.

PROJECT HISTORY

The Elsinore site is located at the mouth of the outlet channel (Warm Springs Creek) on the northeast side of Lake Elsinore, Riverside County, California (Figures 3 and 4). Lerch and Smith (1984) first suggested that a site may be present at this location while conducting a cultural resources investigation of the area of potential impact for a proposed flood control project along the outlet. Although the site was not visible on the surface, ethnohistoric references to the area (Harrington 1978; Kroeber 1908, 1925; O'Neil and Evans 1980) and the knowledge that a site was destroyed during the construction of the baseball fields on the opposite bank of the outlet channel led Lerch and Smith (1984) to recommend that testing be done to determine if buried deposits existed. In 1987, Lerch tested various locations along the outlet channel and documented buried deposits in two areas that he designated Locus A and Locus B. Based on his investigations, Lerch (1987) determined that the site contained data relevant to both the Pauma and San Luis Rey cultures and was eligible for listing in the National Register of Historic Places (NRHP). The historic component of the site, the remains of the Lakeview Hotel, was later tested and determined ineligible for listing in the NRHP (Hampson 1991).
Figure 3. Map of the project area showing defined loci.
Figure 4. Enlargment of 1989 aerial photograph of project area (original provided by Riverside County Flood Control and Water Conservation District).
In 1992, the Los Angeles District, U.S. Army Corps of Engineers (COE) contracted with Statistical Research, Inc. (SRI) to develop a treatment plan for the Elsinore site. This document (Grenda 1992) outlined the methods, strategy, and rationale to be used to mitigate the adverse effects caused by the construction of an enlarged outflow channel that would provide flood control to the surrounding community. The following year the COE contracted with SRI to implement the treatment plan.

Fieldwork was conducted under my direction between August and October 1993. During the last few days of fieldwork, the local Native American tribe filed a lawsuit against the COE that claimed an appropriate plan for the disposition of human remains and funerary items had not been developed. Because human remains were encountered, this legal action prevented artifact analyses and other work until a settlement was reached about one year later. Analyses of artifacts, faunal remains, soils, and other materials took place between January 1995 and June 1996.

As the analyses approached completion, my task of synthesizing the information began. My synthetic work and other tasks were conducted between January and August 1996. At this point, the settlement required that the final report be submitted to the COE and Native Americans. Copies of this report were submitted as an early draft for this dissertation and also sent out for peer review. Between August 1996 and January 1997 the document was substantively edited by Jeffrey Altschul, Su Benaron, and Lynne Yamaguchi. This extremely important task involved removing internal inconsistencies between chapters, strengthening logical arguments, incorporating comments from peer reviewers, and
ensuring the accuracy and consistency of data tables presented in the document. In addition, graphics and illustrations were improved and finalized by Susan Martin. In January 1997, this work culminated in the Statistical Research Technical Series volume, Continuity and Change 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore. This report (Grenda 1997) was submitted by SRI to the COE to complete the mitigation requirements for a water control project along the outlet channel. The completed outflow channel transects the archaeological site near the former location of the Lakeview Hotel.

This dissertation is based on the results of data recovery excavations and analyses for mitigation of the Elsinore site (Grenda 1997). Artifact analyses, geomorphological reconstructions, and faunal analyses conducted during the project are referenced when critical data are presented. Although I put the words to the arguments contained in this document, many of these were developed during my work with the analysts and editors.  

REPORT PURPOSE AND ORGANIZATION

As Schiffer (1987:339) correctly points out, "if archaeology is to develop its full scientific potential...no source of variability can remain unexamined." Following this line of thought, to develop valid inferences concerning the complex human behaviors that occurred at the Elsinore site, we must deal with the formation processes of the archaeological record in an explicit manner. This involves the identification of a variety of
cultural and noncultural processes that introduce variability into the archaeological record.

According to Schiffer (1987) cultural processes can be broadly divided into reuse, cultural deposition, reclamation, and disturbance and natural processes can be thought of in terms of the scale in which they operate (i.e., the artifact, the site, and the region). Early in our investigations we recognized that the Elsinore site was formed by a mixed bag of processes. In addition to those processes that formed the record, an additional source of variability, the behavior of the archaeologist, has been introduced into the equation. The most important aspect of the approach employed in this report is our attempt to identify the consequences of each formation process that allows us to factor out the variability caused by that process. It is this explicit manner of dealing with formation processes that allows us to establish inferences concerning prehistoric human behaviors.

The basic purpose of this dissertation is to present the results of the data recovery efforts at the Elsinore site. The site was determined eligible based on its potential to address a series of research questions pertinent to the Pauma complex, which dates to the middle Holocene, and the San Luis Rey complex, which dates to the late Holocene. During data recovery efforts, it became apparent that the site also had the potential to inform on issues concerning the period of transition between the early and middle Holocene (i.e., San Dieguito to Pauma). During the excavations it also became apparent that in most areas of the site, the Late Prehistoric component was heavily disturbed due to a host of complex formation processes (i.e., rodent burrowing, flood episodes, and modern land alterations). Only a small portion of the site contains intact Late Prehistoric deposits. Based on these
observations, research efforts were focused on questions pertinent to the early and middle Holocene, with an emphasis on the Transitional period.

This dissertation is organized in six chapters. Following this introduction, Chapter 2 discusses key issues facing California archaeologists. This discussion describes current approaches to culture history and provides an intellectual context for the document as a whole. Next, Chapter 3 presents the strategy, methods, and rational that were used to guide the data recovery. This chapter also outlines some of the archaeological processes that have been ignored by archaeologists, and have created an extremely biased archaeological record. Chapter 4 presents the results of our field investigations including trench, unit, and feature descriptions, field observations concerning site structure, and general descriptive statistics concerning the artifact assemblage. This chapter includes the presentation of chronometric analyses and a discussion of the problems associated with their application to the site. Chapter 5 develops a model of prehistoric adaptation to the Elsinore region and discusses how site structure changed through time. Chapter 6 fits the site into a regional settlement model. This chapter also discusses the implications site data have on prehistoric social and economic organization and raises some interesting issues that relate to the broader patterns of southern California prehistory.
CHAPTER 2
CURRENT ISSUES IN CALIFORNIA PREHISTORY

Over the past century of archaeology in southern California a number of research issues have developed and many remain unresolved. Specifically, problems are evident in the current explanations of the transitional periods between the early to middle and middle to late Holocene. Roughly 10,000 years of prehistory are divided into three broad periods that are then subdivided into local cultural "complexes." These divisions focus investigations on the chronological placement of sites rather than the explanation of variability. As a result, our vision of adaptation is blurred and we only see the broader patterns in prehistory. Viewing prehistory as a series of long periods of stability punctuated by relatively short transitions masks the nature of hunter-gatherer adaptive strategies. Most of these problems could be resolved with a clearer understanding of the variability in hunter-gatherer adaptations. We need to direct our attention to the minor adjustments that are made at the local level to better understand this variability.

This chapter focuses on why archaeologists misunderstand California hunter-gatherer lifeways. I believe the roots of the problem are found in five areas. Specifically, I explore: 1) the nature of the archaeological record; 2) the methods used in many cultural resource management investigations; 3) the reliance on controversial paleoenvironmental data; 4) the lack of an appropriate middle range theory; and 5) the use of scant ethnographic sources and questionable ethnohistoric records. Some of these problems are
related and have come to a head in the ongoing debates about late Holocene changes in social organization (Altschul and Grenda 1995; Arnold 1992a, 1992b, 1995; Grenda et al. 1994; Larson et al. 1994; Raab 1993, 1995). Most investigators agree that at the time of early European explorations, the southern coast was inhabited by relatively complex hunter-gatherer societies. Unfortunately, some investigators have fallen into the trap of using a relatively poor ethnographic record to demonstrate the presence of complexity or other cultural phenomena and then projecting these findings into prehistory.

Environmental change, inferred from broad regional data, is seen as the trigger to these organizational changes. The result of this strategy is that almost any discovery can be interpreted as an indication of complexity that occurred in response to environmental change. The question is how can we avoid this trap?

Following Erlandson's (1994:2) argument, I agree that we can only understand the development of complexity and other Late period issues after we reconstruct the nature of the origins and adaptations of the earliest occupants of the region. Where did these early groups come from? What was the nature of the human-environment relationship? What was the nature of the settlement-subsistence interaction? How were the hunter-gatherer groups organized? Although our knowledge of these early cultures has increased over the past six decades, we continue to rely on the cultural sequence originally outlined by Rogers (1945) and we are still in the dark about many key issues. After exploring some of the issues surrounding hunter-gatherers, the accepted cultural sequence for southern California is outlined. Finally, I discuss how we can improve our understanding of
hunter-gatherer lifeways by focusing less on culture chronology and more on some specific hunter-gatherer research issues.

This chapter establishes a background of issues that have plagued archaeologists studying the early-middle Holocene transition and sets the stage for subsequent chapters that focus on the interpretation of specific data categories gathered at the Elsinore site. These data are used to illuminate the organization of culture process at the site which, in turn, allows comparisons to other sites throughout the region.

WHY WE MISUNDERSTAND CALIFORNIA HUNTER-GATHERERS

Three primary factors have contributed to a poor understanding of early hunting and gathering groups. First, for a number of reasons, the existing collection of early and middle Holocene sites poorly represents the variability in hunter-gatherer adaptations. A closely related problem is that many investigators employ methods that do not allow them to recognize variability. Second, recent investigations emphasize broad paleoenvironmental data and tend to ignore local conditions. The use of broad data often overshadows the importance of site formation processes and rarely calls for a reconstruction of the local paleoenvironment. Finally, we lack an acceptable linkage between the archaeological record and hunter-gatherer theory. This lack of an appropriate link has led some investigators to use the ethnographic and ethnohistoric records in an
uncritical fashion. These factors have worked in concert to prevent a clear understanding of the early hunter-gatherers.

Coping with the Physical Characteristics of Southern California Archaeological Sites

Few sites in southern California date to the early Holocene and only a small number of these contain stratified deposits representing the entire Holocene. This leaves issues surrounding the transitions and culture process to be addressed with data from different sites that are difficult to connect temporally. In addition, most recognized early Holocene sites are located in one of three regions: 1) on the coast north and south of the Los Angeles Basin; 2) on the Channel Islands; or 3) around the pluvial lakes in the interior deserts. Finally, many of the best known sites from the early Holocene remain to be adequately dated. For example, portions of the classic "Millingstone" site of Glen Annie (SBA-142), thought to predate 7,000 B.P. (Owen 1964, 1967) may actually date to about 1,500 B.P. (Erlandson et al. 1988, 1991), and other sites such as the Harris site (SDI-149), SDI-210 at Agua Hedionda, Malaga Cave (LAN-138) and Tulare Lake (Wallace and Riddell 1991) have yet to be adequately dated (see Colten and Erlandson 1991:135).

Complicating the issues of timing and contemporaneity, desert sites often consist of lithic scatters with few "diagnostic" artifacts and no datable deposits (e.g., Campbell et al. 1937; Lord 1987) while the methods used to investigate most intermediate valley sites fail to allow for the identification of early sites unless diagnostics, such as crescents, are
found or early radiocarbon dates are obtained. Because datable material is scarce at inland sites, temporal placement is usually based on artifacts typically associated with each broad period. For example, crescents and large bifaces are assigned to the early Holocene, large ground stone assemblages are usually assigned to the middle Holocene, and small arrow points are typical indicators of the late Holocene. Although this classification method has been criticized (Binford 1981; Goldberg and Arnold 1988), many investigators continue to assign cultural periods based on the presence of diagnostics.

Those familiar with southern California archaeology know the frustration associated with excavating and interpreting sites where the top few levels are disturbed from plowing and the remaining deposit is thoroughly mixed from gophers and other burrowing animals. Sites of this nature usually contain a relatively low density of flaked stone debitage and a few tools, a collection of extremely fragmentary faunal remains, a few amorphous rock features consisting of a mixture of fire-altered and non fire-altered stones, and a small assemblage of ground stone (Grenda 1995; Grenda and Gray 1997). A lack of precise dating techniques coupled with poor preservation often leads to site classification based on the presence of a few projectile points or the presence of cogged stones, pottery, or other classic time marker. Multicomponent sites are only identified when different period diagnostic artifacts are found. Unfortunately, many sites lack diagnostics and, due to the lack of recognizable stratigraphy, materials from different
periods are often lumped and interpreted as originating from the same chronological period.

Methods employed at the Elsinore site were designed to cope with a site of this nature and substantial effort went toward the interpretation of the complex stratigraphy (e.g., particle size analysis, geomorphological trenching). Because the stratigraphy was highly complex and in most cases visible only after exposure of a significant portion of the excavation units and trenches, stratigraphic excavation was not feasible. Instead, it was hoped that an accurate interpretation of the stratigraphy could be applied to the spatially distinct units and arbitrary excavation levels during the analysis phase. By correlating the stratigraphic interpretation with the data from the excavation levels we hoped to define distinct occupation episodes across time and space. A precise method of provenience for artifacts and ecofacts is critical to accomplishing this task. This requires an accurate site map, a method of tracking proveniences from the field through the laboratory and analysis phases, and other systems to ensure that the proper spatial relationship of our units of analysis is maintained.

In addition to the problems associated with understanding stratigraphy at most inland midden sites, the relatively small size of the standard excavation units used during data recovery usually provides poor exposure of the area surrounding features. Assuming that hearths and other rock scatters occupy a relatively minimal surface area compared to nonfeature surface area, most excavation units will not encounter a feature. However,
when a rock scatter is found in a unit, additional units are often excavated to fully expose the feature. Rarely are additional units opened to expose the area outside of the scatter. This means that whereas the features themselves are fully exposed, little effort is spent on the area immediately adjacent to the rock scatter where important processing activities may have occurred (Bartram et al. 1991; Kent 1984; O'Connell 1987; O'Connell et al. 1991; Stevenson 1991; Yellen 1977). By increasing the size of the initial excavation unit more nonfeature area is exposed for comparison to the feature. Whereas this concentrates the excavation effort in fewer locations across the site, we argue that the data yielded from such a strategy is much more informative as to use of activity areas when they are encountered (Gregg et al. 1991; Stevenson 1991).

To address the issues surrounding the use of activity areas within a sparse midden site, relatively large excavation units were used. The standard unit size was 2-m by 2-m, but in certain areas 3-m by 3-m units and a 4-m by 4-m unit were excavated. When features were encountered, additional units were added to expose them. It was hoped that this method would provide comparative data from the area around the features.

Although a change in method may solve some of the problems associated with archaeology conducted under contract, a more deeply rooted problem is often associated with this type of work. Most contracts fail to fund synthetic work. This lack of funding often results in site reports that consist of "boiler-plate" discussions of culture history and the environment, descriptive accounts of the material culture, and a concluding chapter that fits the site into the broad culture history of the region. This type of work increases
our knowledge of hunter-gatherers at an extremely slow rate. Thus, whereas the
archaeological database continues to grow, our understanding of prehistory remains
firmly tethered to the first few synthetic overviews of California (e.g., Campbell et al.

**Paleoenvironmental Issues**

An understanding of the changing environmental conditions during the Holocene is
necessary when discussing the site's archaeological context. Fortunately, archaeologists
working in southern California enjoy a relatively high-resolution paleoenvironmental
record. Many paleoenvironmental reconstructions have been produced and provide a
critical foundation upon which models about culture process and the environment may be
built. These detailed accounts of past conditions have a long history of development and
have played a major role in our understanding of prehistoric adaptations.

One of the most important facts concerning the paleoenvironmental record for
southern California is that, similar to the archaeological investigations of the early
Holocene, most studies have been carried out either along the coast or in the desert
region. Along the coast, studies typically involve either the determination of sea surface
temperature based on sediment cores from offshore locations (Hubbs 1967; Kahn et al.
1981; Pisias 1978) or the study of fossil pollen collected from similar cores (Davis 1992;
Heusser 1978). In the deserts, paleoenvironmental reconstructions are generally based on
tree-ring studies that document annual rainfall (Altschul et al. 1996; Feng and Epstein 1994; Larson and Michaelsen 1989). In both of these regions paleoenvironmental reconstructions have had a profound effect on the development of archaeology. It would, however, be a mistake to assume that these reconstructions can be extended to include the intermediate valleys. Even in the areas where the reconstructions are focused, controversy surrounds their results and interpretations. For example, in the Channel Islands region some archaeologists use the paleoenvironmental record to account for cultural change (Arnold 1991, 1992a, 1997; Glassow et al. 1988) while others use the same record to discount the importance of its role as an impetus to change (Raab and Yatsko 1992; Raab et al. 1996; Salls 1988).

Similar to issues in culture history, most paleoenvironmental debates stem from disagreements about how to interpret the record. For example, some coastal researchers claim that shifts in marine temperature have occurred throughout the Holocene, sometimes adversely affecting ocean productivity, and that changes in subsistence remains found in the archaeological record reflect these shifts (Arnold 1992a; Hubbs 1960; Walker and Snethkamp 1984). Others claim that alterations to the habitat triggered by human procurement strategies best explains the changes in subsistence remains (Bleitz and Salls 1988; Raab and Yatsko 1992; Salls 1988). Changes in precipitation (Larson et al. 1994; Raab and Yatsko 1992) and the nature of flood patterns (Grenda and Altschul 1994a, 1994b) are also discussed as potential factors contributing to prehistoric culture change.
For the inland region, the transition from the Pleistocene to the Holocene (12,000 to 8,000 B.P.) was a time of major environmental change. Although varying in magnitude and duration, warming trends in the Holocene led to the evaporation of pluvial lakes, changes in drainage patterns, and changes in both flora and fauna (Altschul et al. 1996; Antevs 1953; Axelrod 1981; Deevy and Flint 1957; Glassow et al. 1988; Koerper et al. 1986; Van Devender and Spaulding 1979). This changing environment affected the human population and led to a number of adaptive responses that often appear in the archaeological record as visible cultural differences (Heizer 1967; Janetski 1983; Jones 1981; Madsen 1979, 1982; Thomas 1981a, 1983).

Whereas regional reconstructions are necessary to place the site in its broader context, a paleoenvironmental reconstruction for the intermediate valley region is clearly needed to explain the archaeological remains found around Lake Elsinore. A general lack of geomorphological reconstructions prevents archaeologists from recognizing variability in hunter-gatherer adaptations. If all sites are considered to be in the same general environment, archaeologists are forced to look at other factors to explain variability. Specific issues that should be investigated are the amounts of rainfall that led to varying water levels in the lake and the availability of water in the region and their affect on the local population, fish die-offs that are fairly common historic events, and the nature of the freshwater marsh that surrounded the site. A major goal of the Elsinore project was to provide a model of environmental change for the site area (Homburg and Ferraro 1997).
Middle Range Theory and Hunter-Gatherer Adaptations

Until the 1960s, it was commonly held that the lives of hunter-gatherers were "nasty, brutish, and short." This view was seriously challenged by a series of ethnographic and ethnoarchaeological studies of the San of the Kalahari Desert (e.g., Lee 1968, 1969). The argument presented by Lee and Devore (1968) and others at the influential *Man the Hunter* conference, suggests that the San are representatives of early foragers, who satisfy their needs with relative ease and had, until recently, remained isolated from outside influence. From this it is argued that modern hunter-gatherers can provide important insights into the course of human evolution and prehistoric behavior (Bird-David 1992).

During the 1980s, this "traditional" view came under fire from "revisionist" researchers disturbed by the evidence suggesting these groups often interacted with neighboring populations, participated in modes of production other than hunting and gathering, and played an active role in the world economic system (Schrire 1980, 1984; Wilmsen 1983, 1989; Wilmsen and Denbow 1990). The initial work and ongoing debates launched a series of ethnoarchaeological projects that served to develop a number of theoretical models for hunter-gatherer adaptations (e.g., Binford 1978; Gould 1978; Silberbauer 1972; Tanaka 1980; Yellen 1977).

Using data from the ethnoarchaeological studies of hunter-gatherers, a "revisionist" movement challenged the view that these groups were isolated from outside forces and questioned the ability of modern-hunter-gatherer studies to shed light on prehistoric
behavior. These researchers also began to construct models of the origins of agriculture, the sources of variability in the record, and the rise of complexity (e.g., Bailey 1983; Price and Brown 1985). Variability was the key to many researchers; each culture appeared to have been shaped by its own particular environment, history, and interactions with outside groups, leading many anthropologists to become skeptical of ethnographic models projected into the past (Denbow 1984; Gordon 1984; Parkington 1984; Schrire 1980; Wilmsen 1983, 1989; Wilmsen and Denbow 1990).

Although a number of theories have been developed to explain variability in hunter-gatherer groups throughout the world (Lee 1972; Bettinger 1975, 1980, 1991; Bettinger and Baumhoff 1982, 1983; Binford 1980; Thomas 1983), linking theory to the archaeological record has been a difficult task. In the Great Basin, Binford's (1980) discussion of mobility practices provides a testable model for addressing adaptive strategies of hunter-gatherers. Following Binford's (1980) discussion of residential and logistic mobility, it is clear that a wide range of mobility strategies was practiced throughout the Great Basin and southern California. Some groups were predominantly highly mobile foragers that moved to resources when they became available and others were primarily collectors that minimized residential mobility through the use of specialized task groups that visited resource areas. Still others practiced a mixture of both strategies by adjusting to changes throughout the year. What is perhaps the most intriguing aspect of the broad region is that different strategies are observed within the same basic environment and among the same cultures. In the Great Basin, most studies
have concluded that these differences can be explained by the uneven distribution of resources across the landscape and the unequal abundance of those resources throughout the year (Bettinger 1975; Bettinger and Baumhoff 1982, 1983; Carlson 1983; Elston 1982, 1986; Raven and Elston 1988; Thomas 1971, 1985).

Whereas archaeologists basically agree that certain mobility characteristics can be seen in the archaeological record and that many of these can be explained by the uneven distribution of resources, Thomas (1985:18) claims that the archaeology of the desert lake biome has yet to be fully explained. In his discussion of lacustrine adaptations, Thomas (1985:18-20) identifies two polar positions. One extreme, termed the *limnosedentary hypothesis*, posits that lakes and marshes provide so many resources that nearly sedentary groups inhabited these environments. The other extreme, termed the *limnomobile hypothesis*, questions the viability of these areas and suggests that a more mobile strategy was required to exploit these areas. Kelly (1983) suggests that Great Basin marshlands lacked the potential to serve as primary resource bases but may have served as secondary resource areas to be exploited when the primary terrestrial resources failed to provide adequate sustenance. This model may be more applicable for the Elsinore site, where subsistence appears to be focused on terrestrial resources (Strand 1997a).

In his discussions of hunter-gatherer mobility, Thomas (1985:21-29) outlines three modes of inquiry into the lacustrine lifeway: 1) modeling lacustrine resource structures and strategies; 2) the regional archaeological survey, and 3) encountering the high-information site. Thomas, however, is critical of the ethnographic record of lacustrine
groups because it is limited and too general to help in the construction of models (e.g., Simpson 1876; Steward 1933, Wheat 1967). We have similar problems in southern California, where ethnographic and ethnohistoric accounts focus on coastal or desert adapted groups. The general lack of lacustrine settings in the region is clearly evident in these accounts.

This lack of accounts has led to an often uncritical use of the ethnographic and ethnohistoric records of life in southern California. Based on ethnohistoric accounts, social organization appears to have been most complex in the more populous Chumash and Gabrielino culture areas with decreasing complexity toward the deserts and to the south (Altschul and Grenda 1995; Erlandson 1994; Jones 1992). Although uncritical acceptance of the ethnographic and ethnohistoric records has been criticized (Grenda and Altschul 1995; Raab 1993; Wobst 1978; Woodburn 1980), it is clear that an extensive trade network was in place (Arnold 1991; Grenda 1996) and that relatively sedentary villages existed along the coast and in many intermediate valley settings (Butler 1974; Freeman and Van Horn 1990; Johnson 1988, 1993; Keller and McCarthy 1989; Martz 1984; Mason 1996; Oxendine 1983; True et al. 1974). Archaeological indicators include large habitation sites, a high proportion of exotic goods, and craft specialization seen in artifact assemblages.

With a discussion of the origins of our misunderstandings of hunter-gatherers in hand, an examination of the accepted cultural sequence in southern California is provided. This examination highlights the problems outlined above and demonstrates how southern
California archaeology has not progressed far from its roots. After this brief examination I propose some areas of investigation that may shed light on some of the issues plaguing the region.

**CULTURE PROCESS IN SOUTHERN CALIFORNIA**

Since Malcolm Rogers (1929a, 1929b, 1929c, 1939, 1945) first described the San Dieguito and La Jolla cultures the nature of their relationship has remained a topic of debate. Most questions focus on the transition between the two cultures around 8,000 years ago. Was the La Jolla culture the result of desert hunter-gatherers pushing to the coast to avoid the unfavorable climates of the Altithermal as Warren (1964, 1968) and others have suggested (Warren et al. 1961; Warren and Pavesic 1963), or were there already people on the coast when the desert groups arrived? The finding of milling stones at sites thought to represent San Dieguito period occupations (e.g., Kaldenberg 1982; Koerper et al. 1991) has stimulated additional debate and led to the idea of a San Dieguito-La Jollan transition period (see Gallegos and Hester 1987). Arguments range from the idea that they are functional variants of the same culture (Bull 1987; Ezell 1987) to the view that they are distinct cultures (Hayden 1987; Moriarty 1987; Smith 1987). Recent evidence suggests that a cultural continuity exists between the San Dieguito and La Jolla during a transition between about 9,500 and 8,500 years ago (Gallegos 1991; Koerper et al. 1991).
Establishing the cultural chronology of the southern California region (Figure 5) has been a difficult task for a number of reasons. First, the cultural sequences created for the region are based on a dispersed group of sites that, for the most part, were excavated in the 1950s and 1960s and are poorly dated. Although cultural resource management projects have recently investigated additional sites in the region, few reports synthesize data beyond the site under investigation. In addition, most of these reports have a narrow distribution further hampering attempts at regional syntheses. Second, archaeologists have attempted to systematize and order a continuous, slow moving, and probably irregular cultural process. Third, because radiocarbon dating is a relatively imprecise technique, chronometric control in the region is poor. Finally, variation in the timing and character of coastal resource use has led to a poor understanding of the foraging ability of the early California inhabitants. This section highlights the issues facing archaeologists who are attempting to establish a cultural chronology in a region where chronological control is weak, sites are widely dispersed, and cultural boundaries are blurry.
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Figure 5. Concordance of southern California chronological sequences.
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Figure 5. Concordance of southern California chronological sequences (continued).
cause of the confusing nature of the cultural chronologies of southern California, the
geologic time scale is employed as the organizing principle. Although pre-Holocene
habitation of the region has been suggested (Bada et al. 1974; Davis 1970; Leakey et al.
1968), none of the purported sites has produced reliable dates earlier than about 9,000
B.P. It is not surprising that controversy surrounds the pre-Holocene, considering that
major issues exist for each subsequent cultural period. Unfortunately, the problems
surroundings chronological issues in southern California have served to "pigeon-hole"
sites or have led to the development of new culture histories. Thus, whereas most of the
New World has relatively well established regional chronologies and archaeologists can
focus on issues of culture process, California seems caught in issues of culture history.
Some researchers are now investigating more diverse topics, although it appears that this
is the result of exhaustion rather than a lack of interest in chronology.

Early Holocene Cultures (10,550 - 7,200 B.P.)

Malcolm Rogers established the first chronology of the San Diego area in 1929.
Based on his initial observations at site SDI-149, Rogers identified an early "Shell
Midden People" and a later "Scraper Maker culture." One decade later, Rogers fully
investigated the site and, perhaps foreshadowing future controversy, reversed the
chronological order of the cultures renaming them San Dieguito and La Jolla (Rogers
1939, 1945). Although this cultural sequence has been modified (Wallace 1955, 1978; Warren 1964, 1968), its basic structure remains intact to this day.

In 1939, Rogers also defined a sequence of industries in the lower Colorado River area: Malpais, Playa I, and Playa II. In 1958, he recognized similarities in the coastal and Colorado River assemblages and renamed the entire sequence San Dieguito (I, II, and III, based on the diversity of the lithic assemblage and the geographic location of sites). This division into distinct phases, however, has been challenged and criticized (Bull 1987; Ezell 1987). Later, the interior desert and lower Colorado River cultures were renamed the Lake Mojave culture (Wallace 1962, following Campbell et al. 1937). According to Wallace (1962), the Lake Mojave culture reflects early adaptations to the changing environment and is very similar to the San Dieguito. Soon after these changes, Warren (1967) offered his definition of San Dieguito and included the interior desert units of Lake Mojave, Death Valley I, Playa I and II, and the coastal units, claiming they were all regional variants of the same culture. Others (Donnan 1964; Wallace 1962, 1978) maintained that Lake Mojave was a distinct culture adapted to a different environment. In addition to the Colorado River and interior desert regions, the San Dieguito culture has also been incorporated into the larger Western Pluvial Lakes tradition that extends from northeastern California to the Mojave Desert and the San Diego coastal area (Bedwell 1970).
As discussed by Rogers (1966) and others (Davis et al. 1969; Moratto 1984), sites in the coastal region that date to the early Holocene belong to the Paleo-coastal Tradition of the Western Lithic Co-tradition. These sites are found along the coast, on the California Channel Islands, and inland along coastal streams and rivers from British Colombia to Baja California. One of the diagnostic traits of these sites is the presence of the eccentric crescent (Jertberg 1978; Moffitt 1995; Tadlock 1966). In addition to the San Dieguito complex, other Paleo-coastal Tradition variants include the Borax Lake pattern (Harrington 1948; Meighan and Haynes 1970), and the Scotts Valley pattern (Cartier 1984, 1993). It is now known that many of these early groups used maritime resources (Salls 1991, 1992), floral resources (Colten 1991), and may have been semi-sedentary in certain areas of the coast (Gallegos 1987; Koerper et al. 1991). Far from being narrowly focused on big game and oriented around pluvial lakes, most early groups were probably just as diverse in their adaptations as groups that inhabited the region in the much later times.

Regardless of the name, these cultures date from about 10,000 to 7,500 B.P. (Moratto 1984), and were adapted to the post-Pleistocene environment in which the megafauna had largely disappeared and the hotter, drier climate had forced groups to settle near reliable water sources. As defined by Warren (1967), San Dieguito was a hunting culture, with a flaked stone industry that included large flake and core scrapers, choppers, hammer stones, drills and gravers. Although plant processing artifacts were virtually absent from the assemblage when Warren described it, there is now little doubt that this culture used
plant resources when available (Basgall and Hall 1993:18-20). Sites are primarily found in eastern San Diego County in ancient lake terraces and no sites of this early culture have been found in the vicinity of the current project area.

Most of the issues surrounding this period involve the origin of the San Dieguito culture and its transition to later periods. Where did these groups come from? How did they adapt to life on the coast and around the Pleistocene lakes? Erlandson and Colten (1991:5) suggest three models can explain the origin of these groups: 1) in situ development from earlier groups; 2) desert groups migrating to the coast to avoid Altithermal conditions; and 3) coastal migration from the north.

Although the first model is largely criticized and seems highly unlikely (Jelinek 1992), the search for earlier peoples should continue. The second model is the most widely accepted and discussed explanation for early coastal groups. However, as coastal settlement is pushed further back in time the third model seems more likely. Viewing the data on a larger scale and with a more synthetic approach, perhaps a combination of these two models (cf., Altschul and Grenda 1995) can help us understand the nature of culture process in the region and put the Elsinore data in better context.

**Early-Middle Holocene Transitional Cultures**

Although Rogers (1939, 1945) failed to explain the transition from San Dieguito to La Jolla, he was the first to describe the two cultures. The transition remains a debated topic
to this day, and a number of hypotheses have been advanced to explain the period.

Warren et al. (1961) and Warren and Pavesic (1963) proposed that the La Jolla culture began circa 7,500 years B.P. when desert foragers moved west to avoid unfavorable Altithermal climates. Kowta (1969) outlined a similar hypothesis and claimed that the movement coincided with the diffusion of agave to the coast. Kowta strengthens these claims by suggesting that the primary function of the scraper assemblage was processing agave and yucca.

Moriarty (1966, 1967), Kaldenberg (1976), and Koerper et al. (1991), find that a continuity exists between the San Dieguito culture and the La Jolla culture. They claim that the La Jolla culture developed out of the earlier San Dieguito culture. Bull (1987) and Ezell (1987) argue that the La Jolla culture and the San Dieguito culture are simply functional variants of the same culture. Others take the view that they are distinct cultures (Hayden 1987; Moriarty 1987; Smith 1987). Moratto (1984) suggests that a combination of some of these models can be used to explain the situation. "Climatic warming after circa 6000 B.C. may have stimulated movements to the coast of desert peoples who then borrowed littoral adaptations from older groups while sharing with them their millingstone and scraper-plane technologies and seed- and agave-processing skills" (Moratto 1984:151).

Another hypothesis that has gained in popularity is coastal migration (Fladmark 1979). Chartkoff and Chartkoff (1984) claim that as coastal settlement is pushed further back in time, the more likely it is that the settlers were not related to the Pleistocene
hunters of the interior deserts. Meighan (1989) has noted similarities between California lithic assemblages and assemblages in British Columbia and Alaska. Erlandson and Colten (1991), however, point out that the assemblages more closely resemble the interior desert assemblages. A major obstacle to solving this controversy is the fact that approximately 17,000 square kilometers of land has been inundated since the end of the last glacial (Carbone 1991), effectively burying most coastal sites. If Meighan's (1989) hypothesis is correct we would expect to find evidence of a coastal migration route at inundated offshore sites along the coast, and larger habitation sites with a material culture reflecting the Transitional period.

Proponents of existing cultural sequences claim that subsistence patterns show marked changes starting around 8,500 B.P. Whether these changes are the result of the adaptation of cultures already inhabiting the region or due to an influx of peoples from the east, or a combination of both, is still a controversial topic. However the changes occurred, they are almost certainly in response to Altithermal climatic conditions and the changing flora and fauna (Gallegos and Hector 1987; Erlandson and Colten 1991). These changes are visible in the archaeological record as a reduced number of projectile points, scrapers, and choppers, and an increase in the amount of ground stone artifacts. While hunting and fishing were not replaced by hard seed processing, the reliance on animals and fish decreased and the diet became increasingly diversified (Koerper 1981). Diversity of adaptation appears to be the norm of the middle Holocene cultures. The Transitional period is the focus of our investigations at the Elsinore site. It appears that
the site holds data that may be key to understanding the nature of the transition from hunting to food collecting.

**Middle Holocene Cultures (7,200 - 3,440 B.P.)**

After a sketchy transition period, middle Holocene cultures (commonly referred to as Millingstone cultures) became firmly established. The La Jolla culture is the coastal region's representative from this period (Wallace 1978; Warren 1967). La Jolla sites tend to be located near the coast and particularly around lagoons and bays suggesting an ecological adaptation to shellfish and other coastal resources. Generally, sites in the San Diego area date from about 8,000 to 2,000 B.P. Inland sites from the same time period are typically described as belonging to the Pauma culture and have a similar material culture, but lack shellfish and exhibit a more sedentary lifestyle (True 1958; Meighan 1954; Warren and True 1961). The Pauma culture has not yet been assigned firm dates (True 1980; True and Pankey 1985). Farther inland, the Sayles culture is present and appears to be a mixture of the Pinto culture and the Millingstone groups of the coastal region.
La Jolla Culture

The La Jolla culture exploited the coastal regions of Orange and San Diego County. La Jollan sites are recognized by ground stone assemblages in shell middens, usually on terraces around lagoons or bays (Rogers 1939, 1945; Harding 1951; Moriarty 1969; Quillen et al. 1984). Major La Jollan sites identified in the San Diego area include Fairbanks Ranch, Batiquitos Lagoon, Santa Fe Knolls, Scripps Estates, and SDI-5130, all of which are on or near a lagoon.

Rogers (1945) and Harding (1951) divided the La Jolla culture into two phases, La Jolla I and II. The latter phase was defined by the presence of cemeteries, trade with the Channel Islands, and an improved lithic technology. Later, Wallace (1955) assigned the culture to the "Milling Stone Horizon" and Moriarty (1966) divided the culture into three phases. Moriarty's La Jolla I (5,500 - 3,500 B.C.) is characterized by the appearance of milling stones, percussion-flaked scrapers, and flexed burials. La Jolla II sites (3,500 - 2,000 B.C.) are identified by the appearance of ground stone discoidals, cemeteries, and an increase in projectile point types. La Jolla III (2,000 - 1,000 B.C.) has a similar material culture but exhibits influence from the Yuman culture (Moriarty 1966:21-23).

The technology at La Jollan sites indicates a mixture of coastal and desert traits because both scraper-plane and ground stone artifacts are found. La Jollan sites include shell middens, fire hearths, ground stone, flexed burials, and a very basic lithic assemblage. In addition, the tool assemblage appears to indicate a greater reliance on
marine resources than the San Dieguito culture (Kaldenberg and Ezell 1974). As indicated earlier, however, Kowta (1969) has suggested that the scrapers were most likely used to process agave and yucca (see also Basgall and True 1985; Salls 1983) and Vanderpot et al. (1993) found agave and cholla in the botanical samples from the Whelan Lake site (SDI-6010). In addition, it has been suggested that these tools were used as woodworking tools (Eberhart and Wasson 1975), hammers (Johnson 1966), resharpening tools (Treganza and Bierman 1958), and flake tools (Jackson 1977). Some of the more interesting artifacts thought to be representative of this culture are ground stone discoidals and cogged stones (often found together). Although many uses have been proposed, the actual function of these stones is unknown (Dixon 1968, 1975; Eberhart 1961; Grenda and Gray 1997; Moriarty and Broms 1971). In the end, it appears that La Jollan assemblages represent a transitional phase from San Dieguito to Late Prehistoric cultures rather than a culture with distinct spatial and temporal boundaries. Additional evidence that indicates the unclear spatial boundaries of the La Jollan culture is the presence of the very similar Pauma culture.

Pauma Culture

Pauma sites are distinguished from ones of the La Jolla culture not on their nature or material culture but solely on their location. Pauma sites are generally found in inland valleys and sheltered canyons, out of reach of marine resources, whereas La Jollan sites
hug the coastline and dot lagoon edges. True (1958), Warren et al. (1961), and Meighan (1954) describe Pauma sites as those which display a relatively more sedentary lifestyle and a greater reliance on gathering when compared to the San Dieguito culture. Pauma sites also contain many ground stone artifacts, a greater tool variety, and lack shellfish remains. Artifact assemblages are similar to La Jollan sites, but subsistence practices are apparently more focused on terrestrial resources. True (1980:30) described what is known about the Pauma culture in the following way:

(1) The Pauma Complex inventory is very similar to that of the adjacent coastal La Jollan...and some undefined but close relationship is proposed between the two; (2) the Pauma Complex as defined here includes very little actual evidence of San Dieguito elements...; and (3) there may be evidence in the area (sometimes associated with Pauma Complex sites) of the Campbell intrusion proposed by Warren.

Even with these recent clarifications by True, many inland, non-ceramic sites continue to be automatically classified as Pauma (Carrico 1987). The lithic assemblage and the lack of ceramics led Lerch (1987) to tentatively classify the Elsinore site as Pauma.

The difference between La Jollan and Pauma sites is primarily based on functional differences in the artifact assemblage. A greater tool variety indicates a greater reliance on terrestrial resources than La Jollan sites. This adaptation is most likely the result of terrestrial resource availability in the settlement area rather than cultural differences. It appears that any "close relationship" between the two could be explained by viewing the
two cultures as functional variants of the same culture (True and Pankey 1985; Vanderpot et al. 1992a). The classification of these two groups as separate "cultures" seems to be the result of archaeologists attempting to define distinct cultural boundaries in an area where boundaries are blurred.

**Sayles Culture**

Between the Mojave Desert (exploited by the Pinto Basin culture) and the coast (exploited by the La Jollan and Pauma cultures of southern California) is a culture that exhibits an assemblage of artifacts that appears to represent a utilization of resources from both the desert and coastal regions. Archaeological investigations, beginning in the 1940s in the Cajon Pass region of southern California, revealed the type site (SBR-421) for the Sayles culture and a number of other sites that typified the culture (Moseley and Smith 1962; Bowers 1976). Excavations at SBR-421, conducted by Kowta (1969) in 1965 and 1966, recovered a ground stone assemblage that also included percussion flaked scraper planes, cores, plano-convex scrapers, choppers, and hammer stones. The mixture of materials within the assemblage led Kowta (1969) to claim that sites of this culture represented a period of technological change. For Moratto (1984:152-153), this culture shows evidence of blending between the Pinto Basin culture of the Mojave Desert and the Millingstone cultures of southern California.
Subsistence patterns, indicated by archaeological investigations, are based on opportunistic hunting of deer, rabbit, and other small game animals, as well as floral resources such as juniper berries and hard seeds (Basgall and True 1985). Whereas investigations suggest that resources were available on a year round basis, a limited variety of tools within artifact assemblages suggests a more seasonal use of sites. From the limited information known about the Sayles culture, it seems likely that the culture is a representation of the Transitional period between the early hunting and later gathering cultures.

Late Holocene Cultures (3,440 - 168 B.P.)

Although in many areas of southern California the "Milling Stone" cultures survived into the late Holocene, some clear changes occurred sometime around A.D. 500. Late Prehistoric cultures in southern California reflect both in situ cultural adaptations in response to environmental changes and outside influence from the Shoshonean (Takic) intruders of the desert regions (Moratto 1984; see Koerper 1981 and Howard and Raab 1993 for discussions of the date of the Shoshonean intrusion). As is true in the earlier periods, cultural distinction is often blurry and/or based on subtle differences. The Late Prehistoric period in the project area is represented by the San Luis Rey (SLR) culture. Originally defined by Meighan's (1954) survey data, the SLR culture of San Diego County, was refined by True et al.'s (1974, 1991) excavation data (see also True and
Waugh 1981, 1982), and has been equated with the historically known Luiseño (True 1966). Although the original definition of the SLR culture was based on survey data, True et al.'s (1974) excavation data made only minor refinements in the definition of the culture (i.e., specific artifactual remains). Based on the results of numerous surveys and excavations (Eberhart 1952; Meighan 1959; Warren and True 1961; Warren et al. 1961), Meighan (1954) and True et al. (1974) divide the culture into two phases, San Luis Rey I (A.D. 1400 - 1750) and San Luis Rey II (A.D. 1750 - 1850), based on the absence (SLR I) or presence (SLR II) of ceramics, cremations, and rock paintings.

The type site for the SLR I phase is SDI-132. At this site, 35 km from the coast, bedrock mortars and associated ground stones were found. The assemblage also included triangular projectile points, bone awls, and assorted stone and shell artifacts. In addition to the features and artifacts, a number of cremations were also discovered (Meighan 1954). The type site for the SLR II phase is Molpa (SDI-308). SLR II adds pottery vessels (including cremation urns), pictographs, and nonaboriginal items such as glass beads and metal knives. A relatively sharp distinction can be drawn between SLR I and II, based on material culture. Whether these distinctions reflect important cultural changes or simply temporal differences remains to be seen (cf., True and Waugh 1981, 1982).

Based on the information gathered on the above mentioned surveys and the excavations at SDI-132, it was inferred that the culture's subsistence pattern was small game hunting and the gathering of seeds and nuts, especially acorns (Meighan 1954).
Later, True and Waugh (1982) proposed that three relatively distinct settlement patterns occurred during the SLR period. The first pattern was characterized by scattered temporary sites suggesting a relatively mobile population. A shift to more sedentary settlements located where streams emerge from canyons, took place in the late SLR I or early SLR II period. Accompanying this shift, True and Waugh (1982:36) propose that a formalized winter-summer seasonal round became established. Finally, during late prehistoric or protohistoric times, the "one village per drainage" pattern shifted to a more complex consolidated village pattern. This last shift was probably stimulated by contact with missionaries and other settlers, and other factors such as drought and resource competition. At this time the subsistence patterns of the SLR culture began to incorporate non-native plants and animals and focus less on coastal resources (Kroeber 1925; Strong 1929; Bean and Shipek 1978; Moratto 1984). Based on ethnographic and ethnohistoric accounts of early contacts with the culture, the settlement pattern was similar to the later Luiseño rancherias. Small settlements were located at spots from the river basin to the higher mountain slopes and were occupied on a seasonal basis depending on resource availability.

**Ethnohistory and Ethnography**

Although identifying prehistoric cultural boundaries is extremely difficult, dividing historic cultures would appear at first glance to be much simpler. Assigning a contact
date, when the Spanish first encountered the Native American population is easy.

Identifying internal cultural change after contact, however, is more difficult. Some of the early encounters led to acculturative processes, whereas others had little impact on the indigenous population. Thus, the transition from the prehistoric to the historic period is simple to date, yet difficult to interpret.

The earliest historic account of contact with the Luiseño was in 1540, when Francisco de Ulloa, a Lieutenant of Cortes, went ashore at the mouth of the San Luis Rey River to fill his canteens and ask the Indians if they knew of any overland routes to the seven cities of Cibola (San Luis Rey Historical Society 1957). His ability to communicate was limited so he continued north along the coast. Finding no other promising route, he returned to San Luis Rey about one month later. The following account is given:

"His second disembarkment included his entire ship's company with arms, food, jewels and gold and silver booty from Mexico. It was accomplished on August 31, 1540.

For the first week they camped near the Indian villages that dotted the shore like a string of beads.

From the filth of the lake and villages the Spaniards lacking the immunity built up over the centuries by the Indians, acquired and rapidly succumbed to a prostrating and fatal form of dysentery.

Captain Ulloa aware, too late, that the disease afflicting his men was associated with the villages at the end of 10 days moved away from the lake and into the protection of a primitive fortress and pre-historic battle-ground. The giant boulders of this area grouped by nature to protect ancient warriors from hostile invaders, bear the symbols and inscriptions of men who lived, according to authorities, as early as 50,000 years ago."
After 3 days illness in this ancient fortress, Ulloa died and was buried by his men on September 5, 1540. The site is marked with a white cross" (San Luis Rey Historical Society 1957).

Other early historic accounts of contact with the Luiseño are in 1542 with Cabrillo and in 1602 with Vizcaino. Notable ethnographic accounts are by Henshaw (1972), Sparkman (1905, 1908a, 1908b), Du Bois (1904, 1908), and Kroeber (1906, 1908, 1909, 1917, 1925). Later, numerous scholars (Gifford 1918, 1922; Strong 1929; Harrington 1933, 1934; and White 1963) added to the ethnographic literature.

While European exploration of California began in 1542, with the arrival of Juan Rodriguez Cabrillo, the Spanish presence was not felt in San Diego until Don Caspar de Portola's overland expedition encountered the Luiseño in 1769. The Spanish found the San Luis Rey River valley to have a plentiful water supply and lush vegetation and began constructing Mission San Luis Rey in 1776. After the Mission was founded serious cultural impacts began (Bolton 1926).

According to Bean and Shipek (1978), Luiseño territory extended from Agua Hedionda Creek northwest to Aliso Creek along the coast, then east to Santiago Peak and south through the Lake Elsinore area to just south of Mount Palomar. Whereas other groups were familiar with Lake Elsinore, according to the relevant literature, the lake is clearly in Luiseño territory (Bean and Shipek 1978; DuBois 1908; Harrington 1933; Kroeber 1925; O'Neil and Evans 1980; Sparkman 1908a, 1908b). "To the northwest and north they had Juaneño, Gabrielino, and Serrano as neighbors; to the east the Cahuilla, and to the south the alien Diegueño of Yuman family" (Kroeber 1925:648). The Luiseño, through
complex social organizations and mechanisms such as clan-governed districts and
seasonal movements of populations throughout the region, followed a planned program of
resource utilization in order to exploit the abundant plants and animals and support a
large population (White 1963; Kroeber 1925; Strong 1929; Bean and Shipek 1978). The
seasonal exploitation of acorns and small game was combined with the exploitation of
coastal resources during the balance of the year. Subsistence also included coastal marine
resources and fish from the rivers and streams. According to Sparkman (1908a), fish
were the main resource of the coastal inhabitants.

"They used a canoe or raft of rushes, with which they went out some distance from
the shore to fish with a dip net. Seine nets were also used. Some wooden canoes
were also made from the trunks of trees. It is stated that voyages were formerly
made with these as far as San Clemente Island. The coast people also fished with
the hook and line. The line was made from the fibre of *Yucca mohavensis* and the
hook from abalone shell... Fish hooks were also made of bone. The Coast people
also consumed large quantities of shellfish of several species. Some say that they
used a harpoon for spearing fish... Others say that no harpoon was ever used by
them. This may be true, but it is certain that the Diegueno used one, and it seems
improbable that the Luiseno would not have employed it (Sparkman 1908a:200).

According to Bean and Shipek (1978), Luiseno villages were usually located in
defendable canyons or coves along the slopes near good water supplies. However,
Kroeber (1925:Plate 57) identifies the village of *Paiahche* immediately north of Lake
Elsinore. Population for the villages ranged between 50 and 200, with the larger ones
spawning nearby satellite villages. Kroeber (1925) estimated the ancient Luiseno
population to be around 4,000 and the 1925 population to be less than 500. In contrast to
Kroeber's estimation, White (1963) placed the population at approximately 10,000 (based on 50 villages with an average of 200 people each). Finally, Cook (1976) claims that the aboriginal population of California stood at 310,000. Based on her estimate of 3 people per habitable square mile, the Luiseño population would stand at about 4,500. It is likely that the true population of the early cultures will never be known, but it is probably a safe approximation to place the population somewhere between 4,000 and 10,000. However large the ancient population was, it rapidly decreased after contact due to the spread of disease and a sharp decline in living conditions (Bean and Shipek 1978).

Lake Elsinore itself, plays a considerable role in the creation myth and religion of the Luiseño and Juaneño. Harrington (1933:81) states that "according to the San Juan Indians, man was created out of the mud of the lake." In addition, the Elsinore Hot Springs near the outlet channel is significant to both the Luiseño and the Juaneño. It was at this location, known as I tengvu Wumowmu, that Wiyot, a religious leader who lead the people out of the north, died. When Wiyot grew ill and started to die, the people took him to a number of hot springs in the area, in an effort to cure him. Elsinore was the last of these hot springs and it was here that he died (DuBois 1908; Harrington 1978).

Missionization

The Spanish, interested in establishing a mission between San Diego and San Juan Capistrano, were drawn to the San Luis Rey River valley because of the water supply,
abundant vegetation, and the large native population (Engelhardt 1921). Mission San Luis Rey was established in 1798 and quickly became one of the most productive missions in California (Bolton 1926). Many Native Americans were brought to the mission, where they were taught the faith, the Spanish language, and crafts (Shipek and Bean 1978). For the most part, however, the Luiseño maintained their previous settlement patterns and political leadership. The success of the mission, began to decline in 1833 when a decree of emancipation of the Indians was passed and in 1835 the mission was confiscated by the Mexican Government. At this time land was granted to citizens for use as grazing land (Elliot 1883; Moyer 1969).

The Rancho Period

A number of factors led to the deterioration of Native American lifeways. The Gold Rush and the granting of statehood to California brought many Anglo-Americans to the area (Bancroft 1886; Kroeber 1925). Additional stress came with the secularization of the mission and the lands being split up; the local Indians were forced to either work on ranchos or become rebels (Moratto and Greenwood 1991). In 1844, Rancho La Laguna (including Lake Elsinore) was granted to Julian Manriquez by the Mexican governor of California (Duffield 1987). The land was incorporated into San Diego County in 1850, and shortly thereafter the ranch lands began to split. Ownership changed hands multiple times and with each change the size of the ranch was altered. In 1883, Franklin Heald,
Donald Graham, and William Collier took over the ownership of the property and established the town of Elsinore near the outlet channel and hot springs. More specific data concerning the expansion of the town and especially the history of the Lakeview Hotel, which was located on the site presently under investigation, can be found in Hampson's (1991, 1992) reports.

Cultural Diversity and Other Broad Issues in Southern California Prehistory

A major problem with the cultural sequence is that it tends to separate cultures based on very slight differences, such as the La Jolla-Pauma distinction, which is primarily based on differences in resource utilization. Similarly, the important cultural transition from hunting to gathering cultures, is based on functional characteristics of their material culture. Goldberg and Arnold (1988) argue that the broad sequences developed in other regions and applied to interior sites may obscure prehistoric patterning. Identifying synchronic cultural differences and diachronic culture change, based on these distinctions, is a very imprecise procedure. The slight differences between the cultures reflects the fact that change in California has been a long and slow process. The problems associated with distinguishing between cultures are reflected in the number of cultural sequences advanced for the region. Whereas other regions of the United States have focused on much broader cultural sequences, California continues to define and redefine its local schemes (cf., Chartkoff and Chartkoff 1984).
Most of the problems associated with these issues stem from the fact that artifact assemblies throughout southern California show little change over time. Archaeologists have generally interpreted this fact as representing long periods of cultural stability. When change is evident in the archaeological record, this is generally interpreted as evidence of dramatic culture change or interaction with outside groups. For example, one generally accepted view of the onset of the Millingstone Horizon is that the drastically changing environment dried up the pluvial lakes, changed drainage patterns, and led to a reduction of inland resources. The human adaptive response to the environmental changes was to move to the coast where resources were abundant. Likewise, cultural change in the river basins and surrounding areas has been connected with the sedimentation of lagoons over the past 2,000 to 3,000 years (Warren et al. 1961; Warren 1964; Gallegos 1985, 1987).

The problem with recognizing prehistoric culture change in this region is that the hunter-gatherer societies were organized around a constantly adjusting subsistence system (Bettinger 1979, 1980; Jochim 1976; Steward 1938, 1955; Thomas 1972, 1973; Yellen 1977). As a result, the shifts in the artifact assemblages are a matter of degree rather than kind. Identifying a change in emphasis from hunting to gathering involves the identification of a process that probably took place over thousands of years and may only be recognizable at the extreme ends of the overall shift. Working from this perspective, Grenda and Altschul (1995) see a shift from a relatively mobile population that visited resource locations at different times during the year, in something probably
approximating a seasonal round, to a relatively less mobile population in the Late period that was tapped into a relatively formalized trading network that served to move the goods to the people (Grenda 1996).

While it is true that the limited view of the archaeological record seems to display distinct cultural boundaries between assemblages, it also holds that long periods of stability, punctuated by periods of rapid change, goes against most models of culture change advanced for hunter-gatherer groups. Change in groups at this level of social organization is usually the result of a changing economic emphasis. Innovation and invention is a far less likely explanation. Thus, change in the Elsinore region was most likely slow and gradual, taking hundreds or even thousands of years to unfold and connect to events far from the lake. As a result of slow and gradual change, most of the temporal and spatial cultural boundaries drawn by archaeologists in recent years can be viewed as simply arbitrary divisions along a continuum. In addition to arbitrarily drawn cultural boundaries, many post-depositional formation processes (Schiffer 1987) have mixed cultural layers and destroyed distinct stratigraphic horizons to the degree that even if clearly distinct cultures existed, they would be difficult to identify because they are often found at the same depth. As discussed by Altschul et al. (1984:109), changes must be viewed as a "dynamic series of events." Detecting slow patterns of change or stability over long periods of time has been a goal of much archaeological research and is a major goal of this project.
With the discussion of the cultural sequence complete, I can now discuss areas of research that may prove fruitful for advancing our understanding of hunter-gatherers. Some of these broad issues were explored in the archaeological treatment plan for the Elsinore site (Grenda 1992). However, because the research design was based on testing results that indicated only middle and late Holocene occupations, questions focused on the Pauma and San Luis Rey cultures that were expected. To provide a more appropriate context for data recovery, the following sections outline the major issues that were investigated.

HUNTER-GATHERER ECONOMIC SYSTEMS

Bohannan (1963:211) defines economy as "the way in which resources, technology, and work are combined to satisfy the material requirements of human beings and of social groups." In addition to material requirements, economies also serve to satisfy social and other nonmaterial wants. In fact, in order to address prehistoric economic issues it is impossible to separate the economy from the larger cultural system. Economies also function within a particular physical environment, which provides the resources and places certain limitations on the system, making it difficult to separate prehistoric economies from the environment.

The relationship between the environment and culture has been at the heart of anthropological research for many decades. How resources are used depends on the
technological abilities of the group, cultural values and personal preferences, environmental constraints, and the size and distribution of the human population. Although the environment does not determine the type of economy, it certainly establishes the parameters within which a group must make decisions. Interesting archaeological problems arise when variability is observed among similar hunter-gatherer groups within a particular environment. A number of theoretical approaches have been formed in an attempt to explain this variability (Binford 1980; Jochim 1976, 1981; Lee 1972; Thomas 1983; Winterhalder and Smith 1981). Some of these approaches show more promise than others but all have provided insights relevant to the archaeological record. Bridging the gap between these theories and the archaeological record is one of the major challenges archaeologists face. To address issues surrounding the interface between the environment and the economy we must examine the extent of the group's technological knowledge, their division of labor, their concepts of wealth and ownership, settlement systems and the questions surrounding mobility and sedentism, subsistence strategies, and population growth and other demographic shifts.

**Technology and Subsistence**

Direct archaeological evidence from early prehistoric sites in southern California is largely technological and usually includes grinding, cutting, and scraping tools, weapons, and features such as rock concentrations, hearths, and hearth clean-outs. Although less
frequently encountered, but equally important, are the faunal remains found at prehistoric sites. From these artifacts and ecofacts archaeologists obtain critical information about manufacturing techniques, raw material acquisition, subsistence, trade, and perhaps craft specialization. In addition, depending on their context, artifacts can inform us about social and ideological behavior. For example, artifacts found in association with burials can reflect ideological beliefs, attitudes concerning the afterlife, and conceptions of the supernatural.

Interpreting artifacts and ecofacts out of context, however, is uninformative (and possibly misinformative) because of variability in the record caused by factors such as differences in site types, cultural and natural formation processes, and human behavior. Habitation sites certainly yield different information about a culture than ceremonial centers, butchering sites, or raw material acquisition areas. Typically, habitation sites yield the widest variety of artifacts and therefore present a more complete picture of the group's economic structure. Because the Elsinore site contains data from multiple time periods and yielded a highly diverse artifact assemblage, it is likely a habitation site and should provide an interesting picture of the changes in adaptive patterns that took place in prehistory.

The principal artifacts recovered from the Elsinore site are flaked and ground stone tools and debitage. The materials recovered during past investigations (Hampson 1991; Lerch 1987) and the documentation of other sites in the area, including a possible lithic procurement site (RIV-4042), raised a series of important questions that were targeted
during data recovery (see Grenda 1992). In addition to those questions focused specifically on the material recovered from the Elsinore site, the lithic assemblage provides data to address the broader questions of technological change during the early to middle Holocene transition and the type of technology used in lacustrine settings. These artifacts provide comparative data for the pluvial lake sites of the desert region and the coastal sites in San Diego County.

Stone tools may also allow for an examination of risk avoidance and mobility issues. Torrence (1989) for example, proposes that variation in tool design and use is a function of the risk avoidance strategies of hunter-gatherers. Risk comes primarily from the mobility of the food resource. Whereas a dependence on migratory animals is highly risky in the short-term, little short-term risk is associated with a dependence on plant resources. It is argued that this is reflected in tool design. Contrasting instruments on the one hand, and weapons and facilities on the other, Torrence claims that instruments, or expedient technologies (cf., Binford 1979), dominate the assemblage of hunter-gatherers dependent on plant resources. Because short-term risk is a minimal factor, instruments tend to be relatively simple in design and rarely maintained for long-term use. In contrast, hunting tools are designed for reliable service and are easy to repair. This minimizes the chance of technological failure during the hunt. Torrence (1989) then uses this model to explain the observed shift from complex to simple lithic technologies that characterizes many archaeological sequences.
Kelly (1988) focuses on the advantages of a bifacial core technology to mobile hunter-gatherers in areas where lithic raw materials are scarce. In these areas, bifaces served as portable cores that could be made into usable flakes and tools when needed. Bamforth (1986) suggests that a mixture of bifacial core technology and expedient core technology is sometimes found where there is an abundance of local raw materials. Some of these ideas may help explain some of the trends and shifts seen in the lithic assemblages at southern California sites.

**Demographic Shifts**

Population growth and its relationship to environmental factors has been a theoretical issue in the social sciences for many years (Boserup 1965; Braidwood 1948, 1952; Malthus 1803; Steward 1955), and is of particular concern to an understanding of the prehistory of southern California. Climate has varied considerably since the onset of the Holocene. Most investigators agree that the Holocene was characterized by alternating episodes of cool/moist and warm/dry climates, with the driest period occurring between 8,000 and 3,000 B.P. (Wilcoxon et al. 1982). Since then, a cooler and wetter period has dominated. These broad climatic shifts were important to the distribution of flora and fauna and had important effects upon prehistoric populations.

Regional population size appears to have fluctuated throughout the early and middle Holocene. Populations were clearly using the coast during the early Holocene, but based
on a decrease in the number of radiocarbon dates, there appears to be a drop in the size of coastal populations between 8,000 and 6,000 B.P. (Glassow et al. 1988). It is interesting that this apparent population decline on the coast probably is reflective of an over-all decrease in the regional population, including the interior areas and, significantly, coincides with a postglacial climate optimum (Antevs 1955; Feng and Epstein 1994).

A cooling trend began after this period and populations expanded rapidly, occupying and exploiting different ecological niches during what Warren (1968) classifies as the Intermediate Horizon. This population expansion is commonly associated with the introduction of the mortar and pestle, suggesting that groups became more accustomed to their arid environment and increased their diet breadth to include acorns. A similar increase in the diversification of land and sea mammals from different habitats indicates that human groups were expanding their subsistence base. Fishing becomes increasingly important and the archaeological faunal assemblage shows an increase in the abundance of fishes from more diverse habitats than is evident from sites dating to earlier time periods (Erlandson 1994:47). The circular shell fishhook was invented during this period (Strudwick 1986; Tartaglia 1976), replacing the bone gorge. Some see this invention as a response to increased population pressure that demanded a more efficient means of capturing fish from different marine habitats (Salls 1988). Evidence from San Clemente Island suggests that semi-sedentary settlements also developed (Raab 1997; Salls et al. 1993).
Was population growth during the middle Holocene a result of internal or external dynamics? Did favorable conditions along the coast promote growth in the populations living there, or, was it a result of inland based groups moving into the coastal areas? Tainter (1977:46) indicates, that based on computer simulations of population growth dynamics in the Santa Barbara Channel area, "overall population grew at a virtually unnoticeable pace." However, new technologies could have also promoted the exploitation of more costly resources that expanded the prehistoric subsistence base, which in turn could have promoted population growth as a result of internal dynamics. Clearly both internal and external factors affecting population growth must be considered.

In areas like Lake Elsinore, where the local environment remained relatively stable over most of the Holocene, populations may have been relatively sedentary. As resources in the broader region became more patchy in the middle Holocene, populations may have aggregated in those areas that remained productive. Highly productive areas were those with stable water supplies that were located near the intersection of multiple environmental zones that would have attracted a diverse set of floral and faunal resources. Lake Elsinore was clearly one of these highly productive areas and provided relatively easy access to many resources.

Whereas population growth in southern California was probably minimal until the late Holocene, population shifts between the individual regions may have served as an important mechanism to relieve stress on groups faced with scarcity. Grenda and Altschul (1995:6-1) claim that when evaluating the early Holocene it is critical to view
the entire region as open to exploitation. Populations were probably low enough to allow free access to most of the landscape. However, as the deserts became less attractive during droughts and the coast during floods, population shifts may have restricted groups to particular areas.

Site Structure and Social Organization

The successful interpretation of community patterns requires that we recognize both contemporaneous occupations and discrete residential units at the site. Unfortunately, obvious indicators of house structures, such as postholes and other structural remains, are rare in southern California. To address issues of site structure and its relationship to social organization we must identify the more subtle indicators of residential units. Gargett and Hayden (1991:29) suggest that hearths and roasting pits, refuse concentrations, and artifact clusters may indicate residential units. However, recognizing the contemporaneity of such features is difficult because of reuse, mixing, and other formation processes (O'Connell 1987). If, however, such features can be connected to households this would be a major step in providing insights into the economic and social organization of prehistoric groups. This is a major focus of these investigations.

The analysis of site structure for the identification of activity areas assumes that such activities are differentially distributed within the site and that there is a quantitative relationship between the specific behavior that occurred and the material record that was
generated (Carr 1984; Hietala 1984; O'Connell et al. 1991). As O'Connell et al. (1991:73) point out, differential distribution does not require that the activities be completely segregated, only that they occur in certain areas more often than others. Correlation analyses may reveal such patterns at the Elsinore site.

Making the leap from site structure to social organization requires the use of ethnography, ethnoarchaeology, and other studies of hunter-gatherers. First, we need to construct hypotheses about the social organization of the groups in southern California. Although the overall social structure is obscure (Bean and Shipek 1978; Boscana 1846; Kroeber 1917; Strong 1929; White 1963), Steward (1955:133-134) argues that the Luiseño were organized into patrilineal bands. This type of social organization has the essential features of patrilineality, patrilocality, exogamy, land ownership, and lineage composition and finds cohesion in kinship relations, co-operative hunting, common landownership, and joint ceremonies (Steward 1955:122-123). Steward (1955:143-150) also discusses the composite hunting band that is similar to the patrilineal band in that it is politically autonomous and controls the principal resources in its area, but the group is much larger and consists of many unrelated families that may intermarry. Although these types of bands are primarily formed where there is a reliance on large game herds or where social practices temporarily introduce unrelated families into the patrilineal band, Steward claims that other composite groups may have formed in areas where abundant wild resources, such as acorns, were available.
True and Waugh (1982) suggest that during late prehistoric times, the San Luis Rey and Luiseño became organized into complex villages consisting of several kin groups. This shift occurred in response to several influences including resource competition, changes in the water supply, and possibly European contact. Identifying the shifts in site structure and social organization through time can only be accomplished with clear chronological control and the separation of site components. If the correlation analyses reveal changes in site structure through time at the Elsinore site, inferences concerning social organization can be constructed.

THE PLACE OF THE ELsinore SITE IN CALIFORNIA PREHISTORY

The determination of cultural boundaries is generally based on the issues of settlement, subsistence, and other economic factors (such as trade and technology). According to the proponents of the cultural sequences advanced for California (e.g., Rogers 1945; Wallace 1955, 1978; Warren 1968), subsistence and technology changed in response to individual cultural adaptations to the changing environment. Thus, early cultures relied primarily on game animals until environmental changes reduced the availability of these resources. Later cultures gathered plants and/or used coastal resources depending on their location.

Inland San Dieguito sites tend to be located on terraces above ancient lakebeds and marshes, whereas coastal sites are generally located in and around estuaries and river channels. These locations appear to reflect an early adaptation to the abundant and easily
exploitable resources of these settings (Warren and Pavesic 1963; Weide 1968; Moratto 1984; Warren 1987). Hayden (1987) claims that the San Dieguito culture covers an area extending from the California desert region east to Texas, and as far south as Oaxaca, Mexico. As discussed above, this culture is divided into three phases, based on technological differences and site location. The lithic assemblage is more varied and sophisticated in the later phases. Percussion and pressure flaked tools are common and include points, knives, crescents, scrapers, choppers, and hammer stones. Ground stone artifacts are noticeably absent from the early assemblages but start to appear on later sites, reflecting adaptive responses to the changing environment.

Presenting a cultural ecological view to explain these later changes, Koerper et al. (1991) claim that the presence of milling equipment and shellfish remains on a number of sites has changed the view of the San Dieguito culture from a generalized hunting tradition to one of more diverse subsistence strategies. Similarly, Jones (1991) claims that the archaeological record shows great variation in the use of marine resources. Marine resource use varies with a number of critical variables including coastal environmental conditions and the efficiency ranking of the locally available coastal resources compared to terrestrial resources. Essentially, Jones challenges established beliefs surrounding the subsistence patterns of the first inhabitants of California, claiming that coastal resources were important in some regions. If these views are followed, identifying a distinct transition from San Dieguito to La Jolla-Pauma is an extremely difficult task. In addition, if the major transition period is difficult to identify, the
proposed, subtle differences between phases within these cultures would be nearly impossible to spot. Again, the paucity of investigated Transitional period sites has impaired the archaeologist's view.

A possible connection between the Elsinore Valley and the lower San Luis Rey River basin was explored in the treatment plan (Grenda 1992) for a number of reasons. First, the San Luis Rey river is a perennial water supply with a relatively large lagoon at its mouth. Thus the river would have provided both fresh water and an abundant supply of floral and faunal resources during the winter months. Second, the San Luis Rey River basin is within the ethnographically recorded culture area of the Luiseño. Although the use of ethnographic boundaries in the construction of prehistoric culture areas is questionable, it does provide a testable hypothesis. Third, although other routes to the coast exist (e.g., San Juan Creek and the Santa Ana River valley), some obvious problems are evident with the major paths. The San Juan Creek is small drainage and does not provide a stable water supply to the area. In addition, the San Juan Creek does not have a lagoon from which a great deal of resources could be gathered. Whereas O'Neil and Evans (1980:226-232) and Wlodarski et al. (1989) mention this general area as the location of four historic villages and a trail that connected Lake Elsinore and the coast, the lack of a lagoon suggests that intense occupation may be limited to the late Holocene. The Santa Ana River is a good water source and has a lagoonal area that supported large populations (de Barros and Koerper 1990), but the route is much less direct and is outside of the Luiseño culture area (Bean and Shipek 1978).
The Elsinore site fits the inferred pattern for a Transitional period occupation. Although water levels in Lake Elsinore have probably fluctuated over the past 10,000 years, the lake is one of the few large bodies of fresh water in southern California. The hot springs may also have been an attractive quality of the Elsinore site. The depth of deposits, the presence of early, middle, and late Holocene assemblages, and the ideal environmental location all combine to demonstrate the attractive nature of this location. Finally, the site may have served as a good stopping point for groups moving from the desert to the coast as it is located nearly midway along the route.

Whereas Late Prehistoric material was found in all areas of the site, most of these deposits were in disturbed context. The only clearly intact Late period artifacts were recovered from the southern portion of the site where they failed to overlay an earlier component. As a result, the primary focus of these investigations is on the environmental, technological, and subsistence changes that took place during the early to middle Holocene transition. The middle to late Holocene transition and other Late period issues are discussed, but are not the main focus of the dissertation.
CHAPTER 3

FIELD AND LABORATORY METHODS

Field and laboratory methods for the Elsinore project are described in this chapter. Procedures for completing the various tasks were designed by Grenda (1992) in consultation with the COE. Because initial testing of the site (Lerch 1987) was interrupted by a landowner's withdrawal of permission to excavate, our data recovery included two parts. The first part of the investigation was the completion of the testing phase, and the second part consisted of an intensive data recovery effort.

Although the Elsinore site is not a "typical" inland site, the discussion in Chapter 2 of the techniques used to cope with most sites illuminates the problems of designing an appropriate excavation and analysis strategy. Methodological concerns and the field and laboratory methods employed to control some aspects of these problems are presented below.

METHODOLOGICAL ISSUES

Fieldwork conducted during data recovery was not limited to addressing the research issues outlined in the treatment plan (Grenda 1992); the field investigations, however, did focus on the stated questions. The site was sufficiently intact to generate abundant data with which we could investigate early and middle Holocene cultures and
address many of the research questions. This information should, however, be viewed within the modern sociopolitical climate (Tilley 1985) and inherent biases must be exposed. A brief critical evaluation of the research design is provided below.

Conducting an archaeological excavation is, by definition, a destructive act. Thus, it is imperative that a well-constructed research design guide the work. One must keep in mind, however, that an archaeological theory simply provides one way of looking at the data, and that there are no final truths. In light of this point, a relatively vocal group of "postprocessual" archaeologists claim that, in addition to providing possible explanations about the relationship between material culture and past human behavior, archaeology also provides a view of the society that interprets the data. Like a museum reconstruction, the archaeologist provides a window to the past through interpretations from the present (Shanks and Tilley 1987).

Producing a modern text that describes the past is not a neutral act. The evidence recovered depends on the theoretical model from which the archaeologist works, and all interpretation of the data is therefore relative (Fowler 1977; Rowlands 1984). When one examines the reconstruction, certain biases are bound to be evident. It is here that the scientific method in archaeology becomes important. Because the archaeologist maintains hegemony over the past, it is the job of the scientific community to identify and remove biases from the interpretation. When evaluating statements about the past, it is important to remember that a research design is just one of many tools an archaeologist has with which to build a reconstruction.
I recognize that the research design (Grenda 1992) does not represent a consensual view of all archaeologists, but a particularistic one, my own. The questions posed and the methods outlined derive from my interest and experience. Cognizant of this bias, I attempted to present a broad design that would recover data on a wide variety of issues, many of which were not explicated or anticipated by that document. It is my challenge to present the results not only so that all can judge our interpretations, but also so that the data can be used by others on quite different sets of issues. To this end, I present the methods in an explicit manner and attempt to identify potential biases in each step.

PREVIOUS EXCAVATIONS

Two testing programs were conducted at the Elsinore site prior to our investigations. The first, conducted by Lerch (1987), was directed toward the prehistoric resources and the second, conducted by Hampson (1991), focused on the historical-period resources. Data collected during these investigations are presented below.

1987 Prehistoric Testing

In 1987, Lerch conducted a testing program at the Elsinore site. Based on a review of the literature and a surface reconnaissance, eighteen backhoe trenches were excavated along the outlet channel. Each trench was approximately 6 m long and 1.5–2 m deep.
Cultural material was found in nine of these trenches, all between Lakeshore Drive and Graham Avenue and southeast of the existing channel. As a result of this trenching program and the surface survey, six test units were excavated at the site (Lerch 1987:Figure 3). All six of the units were 1 by 2 m in size. Test Units 1 and 2 were only dug to 110 cm because the landowner retracted permission to excavate on the property. The other four units were dug until culturally sterile soil was reached. All of the sediment from these units was passed through ¼-inch-mesh screens. Based on the results of his investigations, Lerch defined two loci (A and B) within the site (Lerch 1987).

Because similar methods were employed to retrieve data in both the 1987 testing program and the fieldwork reported here, the information retrieved during the testing program provided some comparable data and is presented in Tables 1 and 2. The primary difference in the data is at the analysis level. Lerch defined fewer lithic raw materials, and defined certain artifact classes differently (see Towner et al. 1997). All trenches were oriented basically east-west, and were dug 1.5–2 m deep. Seven trenches that found no cultural deposits were dug north of Graham Avenue; these were out of the current project area.
Table 1. Summary of Data from 1987 Trenches.

<table>
<thead>
<tr>
<th>Trench Number</th>
<th>Length (m)</th>
<th>Location on Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.75</td>
<td>Off site</td>
</tr>
<tr>
<td>2</td>
<td>13.5</td>
<td>Off site</td>
</tr>
<tr>
<td>3</td>
<td>9.75</td>
<td>North of Limited Ave.</td>
</tr>
<tr>
<td>4</td>
<td>8.5</td>
<td>North of Limited Ave.</td>
</tr>
<tr>
<td>5</td>
<td>8.5</td>
<td>North of Limited Ave.</td>
</tr>
<tr>
<td>6</td>
<td>11.5</td>
<td>South of Limited Ave.</td>
</tr>
<tr>
<td>7</td>
<td>9.75</td>
<td>Off Site</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>North of Lakeshore Dr.</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>South of Limited Ave</td>
</tr>
<tr>
<td>10</td>
<td>8.75</td>
<td>North of Limited Ave</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>South of Limited Ave</td>
</tr>
</tbody>
</table>
Table 2. Summary of Data from 1987 Test Excavations.

<table>
<thead>
<tr>
<th>Test Unit</th>
<th>Location on Site</th>
<th>Depth (cm)</th>
<th>Flaked Stone</th>
<th>Hammer Stone</th>
<th>Ground Stone</th>
<th>Faunal Remains</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>north of Limited</td>
<td>110</td>
<td>307</td>
<td>1</td>
<td>1 mano, 14 mano frags.</td>
<td>214</td>
<td>1 bone awl</td>
</tr>
<tr>
<td>2</td>
<td>north of Limited</td>
<td>100</td>
<td>265</td>
<td>--</td>
<td>3 mano frags.</td>
<td>213</td>
<td>1 biface</td>
</tr>
<tr>
<td>3</td>
<td>south of Limited</td>
<td>250</td>
<td>842</td>
<td>3</td>
<td>4 mano frags.</td>
<td>61</td>
<td>1 incised stone, 7 bifaces, 2 modified bones</td>
</tr>
<tr>
<td>4</td>
<td>south of Limited</td>
<td>90</td>
<td>232</td>
<td>--</td>
<td>1 mano frag</td>
<td>164</td>
<td>2 bifaces, 1 core</td>
</tr>
<tr>
<td>5</td>
<td>north of Lakeshore</td>
<td>100</td>
<td>121</td>
<td>--</td>
<td>1 frag.</td>
<td>119</td>
<td>19 marine shell frags.</td>
</tr>
<tr>
<td>6</td>
<td>south of Limited</td>
<td>180</td>
<td>613</td>
<td>--</td>
<td>4 mano frags.</td>
<td>106</td>
<td>1 uniface, 2 bifaces</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2,380</td>
<td>4</td>
<td></td>
<td>1 mano</td>
<td>877</td>
<td>3 metate frags</td>
</tr>
</tbody>
</table>
1991 Historical-Period Testing

In 1991, Hampson conducted a testing program at the Elsinore site to evaluate the eligibility of historical-period resources. A total of 25 shovel test pits and four trenches equivalent to 14 1-by-1-m units was excavated in Locus B, and 338 lithic artifacts were collected (Table 3). Because prehistoric resources were not the focus of the investigation, most of the artifacts were collected from historical-period deposits. In addition, only one of the four screens employed during the investigation was fitted with ¼-inch mesh, and the other three had ⅛-inch mesh. Thus, the data are not entirely comparable with those from the other investigations. Probably the most important prehistoric artifacts collected during these investigations were a basalt crescent fragment found on the surface and a cryptocrystalline silica biface that closely resembled a Pinto Point.
### Table 3. Summary of Data from 1991 Test Excavations.

<table>
<thead>
<tr>
<th>Unit (40 cm dia)</th>
<th>Depth (cm)</th>
<th>Debitage</th>
<th>Biface</th>
<th>Tool/ Possible Tool</th>
<th>Other Lithics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS/0E</td>
<td>75</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>OS/10E</td>
<td>90</td>
<td>3</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>OS/17E</td>
<td>20</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>OS/20E</td>
<td>80</td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>10</td>
</tr>
<tr>
<td>OS/40E</td>
<td>55</td>
<td>1</td>
<td>1</td>
<td>--</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>10S/35E</td>
<td>65</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>20S/10W</td>
<td>80</td>
<td>3</td>
<td>--</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20S/10E</td>
<td>125</td>
<td>13</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>13</td>
</tr>
<tr>
<td>20S/20E</td>
<td>60</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>20S/40E</td>
<td>55</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>37S/32E</td>
<td>60</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>40S/10W</td>
<td>80</td>
<td>8</td>
<td>--</td>
<td>--</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>40S/10E</td>
<td>60</td>
<td>6</td>
<td>--</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>40S/20E</td>
<td>75</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>40S/40E</td>
<td>55</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>59S/03W</td>
<td>65</td>
<td>19</td>
<td>--</td>
<td>1</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>59S/01E</td>
<td>70</td>
<td>25</td>
<td>--</td>
<td>--</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>59S/01W</td>
<td>65</td>
<td>20</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>59S/03E</td>
<td>48</td>
<td>29</td>
<td>--</td>
<td>--</td>
<td>12</td>
<td>41</td>
</tr>
<tr>
<td>59S/05E</td>
<td>40</td>
<td>39</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>53</td>
</tr>
<tr>
<td>59S/07E</td>
<td>65</td>
<td>40</td>
<td>3</td>
<td>--</td>
<td>8</td>
<td>51</td>
</tr>
<tr>
<td>60S/10W</td>
<td>30</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>60S/10E</td>
<td>55</td>
<td>3</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>60S/20E</td>
<td>80</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>80S/10E</td>
<td>30</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>80S/10W</td>
<td>24</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>80S/20E</td>
<td>35</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>258</strong></td>
<td><strong>8</strong></td>
<td><strong>5</strong></td>
<td><strong>62</strong></td>
<td><strong>333</strong></td>
<td></td>
</tr>
</tbody>
</table>
The first task of our field investigations was to complete the testing of the site. Testing was designed to accomplish three goals. The first goal was to obtain information concerning the vertical and horizontal distribution of cultural deposits, including the extent of prehistoric cultural deposits across the site area, and stratigraphic data concerning the relationship between cultural and natural deposits. Second, we wanted to gather information concerning the number and types of features that were present, and their horizontal and vertical distributions. We needed to determine whether subsurface prehistoric features were present outside of the small area defined by the previous excavations (Lerch 1987; Hampson 1991). Thirdly, although Lerch (1987) tested other areas along the outlet channel, a number of areas were not tested (Michael Lerch, personal communication 1992); we needed to determine if additional pockets of midden existed. These goals were achieved through a combination of mechanical and hand excavations.

SITE RECONNAISSANCE, MAPPING, AND CHARACTERIZATION

Prior to excavating the site, we performed a reconnaissance to assess previously determined site boundaries (Lerch 1987) and to record surface characteristics. Environmental characteristics and distribution such as vegetation cover and density, soil type and depth, and erosional features were noted. All temporally and/or culturally diagnostic artifacts noted during surface reconnaissance were flagged, mapped, and collected. COE engineering maps, previous
excavation maps (Lerch 1987:Figure 3, Hampson 1991:Figure 32) and aerial photographs (see Figure 4) were used during this reconnaissance.

During our excavations a detailed instrument map was made of the site using a transit. This site map (Figure 6) located the areal extent of artifact loci; the grid system, location of past and present excavation units and trenches, site datums, and existing features such as buildings and midden areas. Topography (contours), major topographic features, and existing landmarks were included on the map.

Subsurface Investigations

At Elsinore, where testing data indicated the approximate extent of the site, discretely placed backhoe trenches provided necessary information on the horizontal and vertical distribution of cultural deposits. Backhoe trenches are preferable to alternative mechanical techniques, most notably coring, for several reasons. Coring in some areas of southern California is problematic. Depending on the substrate, hand cores may not penetrate. Truck-mounted cores are expensive and generally do not provide a large enough view (3-inch diameter) to describe the stratigraphy or to characterize accurately the cultural deposit. By contrast, backhoe trenches are an economical technique for determining the depth of cultural deposits, especially where subsurface deposits are expected to exceed 50 cm in depth (Desautels 1978; Kyle et al. 1988). Profiles of trench faces reveal the stratigraphic
Figure 6. Site map showing previous excavation locations and SRI data recovery excavations.
relationships between components, and between features within components. Backhoe trenches also indicate the areal extent of prehistoric deposits. This information was especially important at the Elsinore site, where surface artifacts supplied little information about subsurface manifestations. Backhoe trenches, by virtue of their exposure, also allow for the judicious placement of excavation units in cultural deposits, something not always possible with cores.

Although backhoe trenches are best suited to ascertaining the extent and depth of subsurface deposits and their stratigraphic relationships, hand-excavated units provide a controlled method of characterizing the nature of subsurface deposits at a finer level. During the first phase of data recovery, excavation units were placed in areas where midden was known to exist, such as the midden area where testing had been halted in Locus C.

SRI Trenching Results

The Elsinore site was tested according to the following guidelines, which represented a moderate level of testing. These guidelines were adjusted to provide a greater or lesser degree of site coverage depending on the size and nature of the area discovered. Testing served as an important guide for the placement of trenches and hand-excavated pits during the second part of the data recovery program.
A grid system was placed over the known surface area of the site (see Figure 3). Given the size of the site, 20-m units provided an appropriate grid size. A finer grid size, such as 10 by 10 m, would have created so many grid units that the cost in time and resources would have been prohibitive. In our experience, 20–25 m is the optimal backhoe trench length. Shorter lengths increase the cost of trenching dramatically, because more backhoe time is spent setting up trenches and moving between them. At greater lengths, operators encounter difficulties in keeping trenches straight, and safety factors come into play.

Using the 20-by-20-m grid, we initially placed 11 trenches (Trenches 1–11) along both sides of the outlet channel, as shown in Figure 6. Backhoe trenches were constrained by large trees and other obstacles, and, therefore, were judgmentally placed in areas that were likely to have the greatest alluviation and greatest depth of overburden. They also had the highest potential for subsurface cultural deposits based on previous trenching. The trenching pattern provided adequate coverage of the site area and identified the presence of subsurface features and middens and their vertical and areal extent without unduly disturbing the area. A higher density of trench placement was not pursued for the limited testing part of data recovery. This strategy had the advantage that if further testing was necessary during the second part of data recovery, the existing grid system could be used and additional trenches could be located between existing ones.

Areas to be trenched were surface collected prior to trenching. Trenches ranged between 7 and 150 m in length with a width of approximately 70 cm. Depth fluctuated
between 1.3 and 4 m. Diagnostic artifacts (primarily ground stone) were systematically collected from trench walls and backdirt during the course of trenching. Trench walls were faced and left exposed to define features. After exposure, trench walls were reinspected and anomalies refaced. Scaled profile drawings and standardized forms, including detailed descriptions of sediments, were completed and photographs taken. Profiles of large sections of one of the walls were drawn. Where appropriate, profiles were extended a few meters off site to show the transition to off-site soils. Additionally, soil samples were collected from selected trenches. A representative sample of trenches that lacked cultural features and deposits were also recorded to document site stratigraphy and permit reconstruction of the depositional environment and history of postdepositional modifications.

A geomorphologist (Antony Orme) was consulted to interpret the stratigraphy and site formation processes. Near the end of the fieldwork phase, Orme advised us to extend Trench 8 to approximately 130 m and to excavate a new trench (Trench 12) in the northern portion of the site to provide adequate exposure for a complete geomorphological assessment of site formation processes. To provide continued vehicular access to the northern portion of the site Trench 12 was split into two sections. These geomorphic trenches were oriented roughly north-south and provided lengthy exposures of the stratigraphic sequences along the outlet channel.

Because of the complexity of the stratigraphy and its importance to the reconstruction of changes in the site setting through time, Homburg and Ferraro (1997)
provided an in-depth examination of these issues. Chronology was added to their reconstruction (summarized in Chapter 4) by employing radiocarbon assays, obsidian hydration measurements, and diagnostic, time-sensitive artifacts (e.g., crescents, shell beads).

In all, 12 backhoe trenches were excavated during data recovery (see Figure 6). Trenches 1, 4, 6, 7, 9, 10, and 11 contained no cultural deposits and were determined to be off site. Trenches 2, 3, 5, 8, and 12 displayed the transition from off-site to on-site and served to establish site boundaries in these areas. Data for all 12 trenches are summarized in Table 4.
Table 4. Summary of Data for Backhoe Trenches in the Project Area.

<table>
<thead>
<tr>
<th>Trench Number</th>
<th>Length (m)</th>
<th>Depth (m)</th>
<th>Orientation</th>
<th>Wall Profiled</th>
<th>Midden Depth (m)</th>
<th>Disturbance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>max.</td>
<td>min.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>2.0</td>
<td>E-W</td>
<td>none</td>
<td>--</td>
<td>--</td>
<td>modern trash</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>3.7</td>
<td>E-W</td>
<td>N</td>
<td>1.8</td>
<td>0.8</td>
<td>irrigation pipe/channel fill</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>2.4</td>
<td>E-W</td>
<td>N</td>
<td>1.9</td>
<td>0.4</td>
<td>discing</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>4.0</td>
<td>E-W</td>
<td>none</td>
<td>--</td>
<td>--</td>
<td>fill/modern trash deposits</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>1.5</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>probable channel fill</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>1.3</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>trash from hotel demolition</td>
</tr>
<tr>
<td>7</td>
<td>46</td>
<td>2.0</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>channel fill episodes/modern trash</td>
</tr>
<tr>
<td>8</td>
<td>150</td>
<td>2.0</td>
<td>N-S</td>
<td>E</td>
<td>1.4</td>
<td>--</td>
<td>pipe/trash pits</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>2.2</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>channel fill</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>4.0</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>channel fill</td>
</tr>
<tr>
<td>11</td>
<td>18</td>
<td>4.0</td>
<td>E-W</td>
<td>N</td>
<td>--</td>
<td>--</td>
<td>channel fill</td>
</tr>
<tr>
<td>12</td>
<td>77</td>
<td>3.0</td>
<td>N-S</td>
<td>E</td>
<td>2.25</td>
<td>1.6</td>
<td>some fill/trash</td>
</tr>
</tbody>
</table>
SITE BOUNDARIES AND LOCI

After trenching, our next field task was to establish the project boundaries. This was accomplished by placing a datum at a known point identified on the construction map provided by the COE. From this datum we established a site grid that tied our excavation units to the construction map and previous excavation maps created by Lerch (1987) and Hampson (1991). This task was critical for two reasons. First, the new channel alignment would destroy previous datums and other landmarks rendering earlier maps open to various interpretations. Second, creating a composite overlay map assured that we would not excavate in areas previously investigated. This composite map is shown in Figure 6. Using the construction maps also allowed for the placement of units and trenches within the defined project area. We established a number of secondary datums to help us map portions of the site not visible from the primary site datum.

Horizontal and vertical proveniences of excavation units, disturbances, and landmarks were mapped using a transit, stadia rod, and tape measure.

The study area consisted of a rectangular piece of land, approximately 400 by 100 m, encompassing both sides of the outlet channel between Lakeshore Drive on the south and Graham Avenue on the north (see Figures 3 and 4). The site originally covered a much greater area but construction of the baseball field, structures, roads, and parking lots has destroyed or obscured much of the site. In addition, Hotel Hill is used as a fireworks launch area during annual Fourth of July celebrations. Because of fire danger, the base of
the hill is annually cleared of vegetation with a mechanical blade. Evidence of this activity was found in the form of a small (30–40-cm) berm around the perimeter of the site and the lack of vegetation in this area. Finally, because the flood in the winter of 1992–1993 inundated the boat launch facility and parking area that were located south of Lakeshore Drive, the area south of Hotel Hill and west of Spring Street was graded for a parking area to facilitate the new boat launch immediately south of Lakeshore Drive. Evidence of this activity was found in the form of a 1–2-m berm from Lakeshore Drive transecting north up Hotel Hill. Additional disturbance in the south half of the site included a large pile of sediment lining the outlet channel immediately north of Lakeshore Drive. This pile was probably created during COE dredging of the channel in connection with the 1980 flood.

Testing of areas along the outlet channel north of Graham Avenue found no archaeological resources (Lerch 1987:10). Similarly, four backhoe trenches (Trenches 4, 9, 10, and 11) placed on the western side of the channel during our investigations found no intact archaeological deposits. Between Lakeshore Drive and Limited Avenue, trenching revealed evidence that the outlet channel had been shifted to the east (probably in an attempt at bank stabilization), whereas the western bank north of Limited Avenue displayed evidence of a landfill to reclaim land as a parking area. The area between Lakeshore Drive and the lake (south of Locus A) varied in size with differing lake levels and was not tested during this project. Based on the general location of the site, this area may contain additional loci that were occupied during lower lake stands.
North of Limited Avenue, on the eastern bank of the channel (Locus C), disturbance included the construction of homes, commercial buildings, and parking lots. In addition, because Limited Avenue ends at the outlet channel, the open lot has been used as a vehicle turnaround area. A dirt road indicated that occasional traffic had crossed north over the site to Graham Avenue. Finally, a 36-inch irrigation pipe transected the site parallel to the outlet channel. Disturbance to the site prevented any meaningful surface collection; however, artifacts discovered on the surface during our investigations were mapped and collected.

Prehistoric cultural materials were located during construction of the baseball fields (Cauch 1994; Lerch and Smith 1984), and few surface artifacts currently exist in this area. Rather than trying to define site boundaries or characterize the entire site, our fieldwork focused on gathering a representative sample of artifacts and ecofacts from the site in order to address the specific research questions outlined in the treatment plan (Grenda 1992). Site boundaries defined by Lerch (1987) were, however, refined by the current investigations and are shown in Figure 3.

Although Lerch (1987) defined two loci based on a separation of deposits on site, our analyses led us to divide the site into three loci based on differences in the artifact assemblages. The southern portion of the site (Locus A), immediately north of Lakeshore Drive, had relatively shallow deposits that contained a relatively low density of artifacts. The middle portion (Locus B), immediately south of Limited Avenue, contained the earliest style of artifacts (i.e., crescents) and produced a relatively high density of lithic
debitage. The northern portion (Locus C), north of Limited Avenue contained a high
density of extremely diverse artifact types. Based on the stratigraphic interpretation of the
site (Homburg and Ferraro 1997) and the presence of a crescent in the bottom of Unit 20,
Locus C apparently had an early Holocene component at the bottom of the deposit but
was mixed with middle Holocene materials. Although the lithic assemblage of Locus A is
broadly similar to Locus B, based on the stratigraphic reconstruction and radiocarbon
assays, Locus A appears to have been occupied only during the late Holocene. It is likely
that the entire site is capped with late Holocene (SLR I period) artifacts, and in many
areas these artifacts have been mixed with much earlier materials.

INTENSIVE DATA RECOVERY

Although mechanical trenching provided relevant information to meet the
objectives for the first part of the data recovery, additional information—the nature and
condition of features and artifact distributions—was required for the second part.
Hand-excavated units provided controlled subsurface artifact collections and obtained
additional information concerning features. Units were excavated according to the
following guidelines.

1. Units were placed in the heavy midden area identified as Locus A (Lerch 1987)
and in other areas determined to have intact midden deposits (Locus B). The number of
units depended upon the size of the deposits. One or two 2-by-2-m units were suggested for each 20-m-grid square encompassing a midden area.

2. Units were excavated based on information provided by mechanical trenching. When trenching revealed discrete areas representing midden deposits or features, units were dug to address research questions. Units were judgmentally placed in each of the discrete areas located. Similarly, units were placed over features that were located during trenching in order to provide functional information and controlled artifact collections.

Twenty-seven units (96 m²) were judgmentally placed in the midden that was exposed in the walls of trenches and in those areas known from the previous investigations to contain cultural deposits. These units represent about 0.8 percent of the site area that contained cultural material. Excavation of the sample units included the following tasks: laying out units, excavating and screening the fill (both dry and wet screens were employed), drawing profiles, and collecting flotation, pollen, and soil samples. Procedures involved in executing these tasks are described below.

In addition to those methodological reasons discussed above, unit size was determined judgmentally and by the trenching results. Although 1-by-1-m units may have been adequate to provide artifact collections, safety concerns were created in some of the geomorphological conditions, and where deposits were deep. Trench profiles indicated the depth of cultural deposits and therefore dictated the size of units. Most units were 2 by 2 m, although they ranged from as large as 4 by 4 m to as small as 0.5 by 0.5 m. The smallest units were column samples placed immediately adjacent to larger units. All
units met the required safety guidelines dictated by the Occupational Safety and Health Administration (OSHA) and other agencies. Shoring was employed in deep units.

Because of the ephemeral nature and complexity of the stratigraphic profile (Homburg and Ferraro 1997), units were excavated in 10-cm arbitrary levels until the bottom of the cultural deposit was reached. When possible, fill was dry screened through ¼-inch mesh and then hydraulically processed through ¥/8-inch wet screens to clean the material and remove residual sediment. In many areas the clay content of the fill prevented the use of dry screens and the material was placed in 20-liter buckets, labelled with the appropriate provenience information, and taken directly to the wet screens for processing. The fill from those units where mud was encountered because of the high water table was also processed in the wet-screens. Unit walls were faced, then the profiles were drawn, recorded on appropriate forms, and photographed with both 35-mm black-and-white and color film.

Flotation, Pollen, and ¥/8-Inch Screening Samples

The use of ¥/8-inch mesh provided comparable results to other sites in the region. Although it is common to use ¥/8-inch mesh in the area, it has been criticized because it is heavily biased against the recovery of fish remains (Erlandson 1988). Unfortunately the time involved in screening all fill through ¥/8-inch mesh is excessive. To solve this problem, a sampling strategy was developed that included taking soil, flotation, pollen,
and chronometric samples where appropriate during the excavations, and screening selected samples through $\frac{1}{16}$-inch mesh. In addition, pieces of charcoal exceeding about 1 g in weight were saved.

Each level of Unit 19 (1 by 1 m) was processed as a flotation sample, with the heavy fraction being passed through $\frac{1}{16}$-inch mesh as a control. Additionally, four 0.5-by-0.5-m column samples (Units 22, 23, 24, and 25) were excavated adjacent to other units. These columns were located in the least disturbed portion of the profile. Areas that were visibly altered by bioturbation were avoided as much as possible.

Approximately 30 liters of sediment were removed from each level of these 0.5-by-0.5-m columns. Twenty liters of this sediment were screened through $\frac{1}{8}$-inch mesh. The other 10 liters were poured into a 30-gallon container of water and agitated allowing light materials to float to the top. The light materials were then poured off into 1-mm mesh. The heavy fraction was poured into $\frac{1}{16}$-inch mesh and sorted. The samples that were passed through the $\frac{1}{16}$-inch screen were kept separate from those that were passed through the $\frac{1}{8}$-inch screen. Although we anticipated finding more small lithics, fish, and other small animals in the $\frac{1}{16}$-inch mesh, this was not the case. The only difference was that one additional species was found in the smaller mesh. The bone fragment was large enough to have remained in the $\frac{1}{8}$-inch mesh, however, and thus was not found because of using smaller mesh. Specific comparisons of the results from these different mesh sizes were discussed by Strand (1997a) and Towner et al. (1997).
Pollen samples were collected from underneath some of the ground stone and other rocks that were found during excavation. About two cups of soil for each sample was collected with a trowel that had been washed with distilled water. The soil was put into paper bags and sealed before being sent to the lab. Ground stones collected for pollen washes were wrapped in aluminum foil and then placed in a paper bag and sealed.

**Feature Excavation Procedures**

Because of the unique information that can be gleaned from features, they were treated with special consideration. When features were encountered in excavation units, they were drawn in plan, photographed, one-half excavated and the face profile drawn. Then the remaining half was excavated. If the feature appeared to continue into the sidewalls of the unit, additional units were opened up to excavate the feature. For example, during the excavation of Feature 1 additional units (12 and 14) were opened to expose it fully. During this process Feature 2 was encountered. Unit 18 was then opened to expose Feature 2. After Features 1 and 2 were fully excavated, Feature 4 was encountered (Figure 7). In all features the fill was removed in natural or cultural levels where these were present, or in 10-cm levels elsewhere. All feature fill was processed in the field as a flotation sample according to the procedures stated above.
Figure 7. Cutaway diagram showing the relationships between Features 1, 2 and 4.
Treatment of Human Remains

Human skeletal remains recovered during data recovery were treated in accordance with federal and state laws governing their treatment and disposition. When human remains were encountered, all excavation in that area of the site was halted, and Ms. Stephanie Albright, deputy coroner for the Riverside County Coroner's Office, was immediately notified of all findings. A coroner's representative was dispatched to the scene who then examined, removed, and took possession of the human remains. In the case of Feature 10, the coroner identified no associated grave goods. After the human remains were in possession of the coroner, the Native American Heritage Commission named Mr. Vincent Ibanez of the Temecula Band of Luiseño Mission Indians as the most likely descendent. Mr. Ibanez then took possession of the remains from the coroner and repatriated them in an area unknown to SRI.

OTHER FIELD AND LABORATORY PROCEDURES

Washing and Sorting

Because of the amount of material being collected, initial washing and sorting took place in the field. These and other tasks relating to sorting, cataloging, and curation are described in this section. Materials recovered during the excavations were washed.
during the wet screening and set out on drying screens. Animal bone and shell that were too poorly preserved to withstand wet screening were either dry brushed or not washed in the field. Diagnostic artifacts observed during excavation that were to be submitted for special analyses (e.g., protein residue, pollen wash) were not subjected to field washing. After drying, materials were sorted according to type, placed in artifact bags, and checked into the field storage facility. To ensure that materials were consistently sorted, selected field personnel were dedicated to this particular task. Fragile items such as beads and bone tools were placed in plastic vials for protection.

• Check-in Procedures

Crew chiefs collected all artifact bags and specialized samples from crew members at the end of each day. Bags were then temporarily stored in boxes arranged according to provenience before being transmitted to the laboratory. Materials were packed carefully to prevent damage. It was also the crew chiefs' duty to check in all project notes and arrange them according to their provenience. An item list, provenience list, bag list, feature list, and photograph log were maintained by the crew chiefs. Crew chiefs ensured that these materials were completely and accurately documented. Once materials were transmitted to the SRI laboratory, the laboratory director then assumed responsibility for them.
Cataloguing

A relatively simple cataloguing procedure was designed to enable easy access to the collection. Most artifacts were stored in plastic reclosable bags with provenience and catalog data recorded directly on these bags with permanent ink. When materials were sorted into artifact and other classes in the field, bag numbers were assigned. Objects removed for special treatment or illustration received their own unique tracking number. This strategy facilitated tracking of these items using a computer database. It also assisted in retrieval of specific items that had to be reexamined during analysis. Artifacts were counted by the individual analysts to eliminate redundancy and misidentification; this information was later entered into the computerized catalog record.

Sample Transmittal

Upon completion of the basic inventory, those materials to be analyzed were supplied to the various specialists. The analyses of materials were conducted according to the Protocol for the Treatment and Analysis of Artifacts Recovered from the Elsinore site (Statistical Research, Inc. 1994), either by specialists on the SRI staff or by others who maintain their own laboratory facilities. The laboratory director was responsible for transmitting those samples to the appropriate specialists. An inventory of all samples shipped out for analysis was kept.
Specialists were responsible for their portion of the laboratory work. Each respective specialist was provided with an inventory of all materials submitted as well as the appropriate background information necessary for the analysis. Upon completion of their analysis, specialists returned samples to SRI. Certain items, including a small number of faunal bone and shell samples submitted for radiocarbon dating, were destroyed as part of the analytical procedure.

Sample Selection

Upon completion of fieldwork, it was clear that the amount of collected lithic and faunal material would necessitate a sampling strategy for analysis. After the samples were transmitted to the respective laboratories, an initial inventory of the collections was conducted to help determine the sampling strategy. For lithics, temporally diagnostic tools and the number of lithics present in each level were inventoried. An initial inventory of the faunal material was conducted by weighing the bone from each unit and level and noting the presence of sawn bone (indicative of historic disturbance). The information from these initial analyses were combined with field notes and observations of stratigraphic integrity to determine those units and levels that had the most integrity and that might yield the most informative data. In addition, it was decided that units from each of the loci should be represented in the sample.
This strategy led to the selection of 12 units for analysis. Column samples from each locus (Units 19, 22, 23, 24, and 25) subjected to flotation and \( \frac{1}{16} \)-inch screening, were chosen for analysis. To provide comparative data for these relatively small units the larger units adjacent to them were selected (Units 3, 4, 8/21, 10, and 16). Finally, because of the presence of a human burial in Unit 20, it was decided that this unit should be analyzed to address research issues concerning ideology and socioeconomic status. Each of these units was scrutinized for indications of disturbance and certain levels were eliminated. The sample thus chosen was still larger than expected and beyond the budgetary constraints of the contract. In those areas where large amounts of data were available for every level (e.g., Unit 16) certain analyses were conducted on every other level. See Chapter 4 for specific sample selection criteria for each data class.

**SUMMARY**

Fieldwork was designed to address the research issues outlined in the treatment plan (Grenda 1992). The actual research was able to go beyond these issues, however. Paying attention to the details of hand excavation and of washing, sorting, cataloging, transmitting, and sampling the artifacts yielded considerable information on spatial and temporal trends across the site. Presentation and analyses of these data are presented in Chapter 5. The trenching program carried out as part of the initial testing of the site allowed us to determine the boundaries of the site. Trenching also allowed us to
understand the geomorphological conditions present at the site. This understanding was crucial for interpreting the data and understanding the relationships between the artifacts and features. The results of the archaeological investigations are presented in the next chapter.
CHAPTER 4

RESULTS

Fieldwork was conducted between August 23 and October 14, 1993, and focused on collecting data from the cultural deposits to address research questions outlined in the archaeological treatment plan (Grenda 1992). To address these questions, four data sets were obtained from the site: artifacts and ecofacts for subsequent analysis; obsidian samples for sourcing and dating; pollen and flotation samples for micro- and macrofossil analysis; and soil samples, stratigraphic profiles, plan maps, and photographs to provide a control and context for our interpretations. This chapter establishes the necessary context for the subsequent interpretive chapters on the site and region by discussing geoarchaeological conditions and by describing and summarizing our findings from each of the excavation units and features.

The chapter is therefore divided into three parts. It begins with a brief summary of Homburg and Ferraro's (1997) geomorphological reconstruction and site formation processes that permitted a more informed interpretation of the archaeological context. The second part of the chapter consists of a description of the excavation units and features. This section includes summary statistics of the artifacts and ecofacts recovered from these areas. The chapter concludes with a summary of our findings.
GEOMORPHOLOGY, SITE FORMATION, AND THE PROJECT AREA

In addition to providing controlled samples, subsurface investigations provided more-precise horizontal and vertical parameters for the site. Backhoe trenches were placed to clarify the nature of the geomorphology at the site as well as indicate where the subsurface cultural deposits were located. The following section is based on Homburg and Ferraro’s (1997) geomorphological reconstruction and discussion of site formation processes.

Based on their interpretations of site stratigraphy that reflected disturbances, and postdepositional processes such as erosion, deposition, and stability, Homburg and Ferraro (1997:70-75) outline a paleogeographic model of landscape change at the Elsinore site during the Holocene. Stratigraphic relationships were established through the use of superimposing, radiocarbon dating (Table 5), and artifact cross dating. Hypothetical landscape maps were then developed to help illustrate the reconstruction.

As shown in Figure 8, sediments in the Main Site facies were deposited during the early Holocene along the shoreline of a small embayment that extended into the outlet area when lake levels high. During seasonal flooding or other cyclical events, an erosional channel interrupted the deposition by cutting through the facies and lowering the lake level. It was during this portion of the early Holocene that cultural use of the site began. At this time, people were using the beach area along the lake edge. After the initial use of this area, water levels rose and reworked these cultural deposits into a more recent
Table 5. Radiocarbon Dating for Lake Elsinore.

<table>
<thead>
<tr>
<th>Provenience Type</th>
<th>Sample Type</th>
<th>Sample Number</th>
<th>Radiocarbon Age</th>
<th>Calibrated Age</th>
</tr>
</thead>
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<td>shell</td>
<td>Beta-88914</td>
<td>160 ± 60 B.P.</td>
<td>590 ± 60 B.P.</td>
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<td>[13^C] %oo</td>
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<td>+1.2</td>
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<td></td>
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<td></td>
<td>590 ± 60 B.P.</td>
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<td></td>
<td>A.D. 1835-1950</td>
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<td>Unit 16 Level 15</td>
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<td>4800 ± 60 B.P.</td>
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<td>-0.4</td>
<td>4800 ± 60 B.P.</td>
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<td></td>
<td></td>
<td>2860 B.C.</td>
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<td></td>
<td></td>
<td>2890-2750 B.C.</td>
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<td></td>
<td>2970-2620 B.C.</td>
</tr>
<tr>
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<td>8100 ± 60 B.P.</td>
<td>8400 ± 60 B.P.</td>
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<td>6630 B.C.</td>
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<td></td>
<td>6740-6555 B.C.</td>
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<td>6930-6475 B.C.</td>
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<td>Unit 21 Level 11</td>
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<td>Beta-88917</td>
<td>400 ± 120 B.P.</td>
<td>390 ± 120 B.P.</td>
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<td>A.D. 1475</td>
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<td>A.D. 1425-1650</td>
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<td>A.D. 1385-1685</td>
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<td>A.D. 1740-1810</td>
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<td>A.D. 1725-1815</td>
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<td>A.D. 1920-1950</td>
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<td>150 ± 60 B.P.</td>
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<td>-24.4</td>
<td>A.D. 1685</td>
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<td>A.D. 1740</td>
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<td>A.D. 1930</td>
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<td>A.D. 1670-1950</td>
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<td>A.D. 1650-1950</td>
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<td>Unit 3 Level 22</td>
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<td>Beta-85455</td>
<td>modern (99.8 ± 0.6%)</td>
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<td>A.D. 1890-1905</td>
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<td>4530 ± 80⁰</td>
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<td>3870-2635 B.C.</td>
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<td>2915-2545 B.C.</td>
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* Accelerator mass spectrometry (AMS) dates
† Dates subjected to extended counting.
‡ Adjusted for local reservoir correction
Figure 8. Paleographic reconstruction for the early Holocene (10,500-7,200 B.P.) from Homburg and Ferraro 1997.
Figure 9. Paleographic reconstruction for the middle Holocene (7,200-3,440 B.P.) from Homburg and Ferraro 1997).
Figure 10. Paleographic reconstruction for the late Holocene (3,440-50 B.P.) from Homburg and Ferraro 1997).
stratum. Episodes of beach building, interrupted by channel cutting, created three strata each with different periods of stability in the Main Site facies. These sediments contain the oldest cultural deposits on the site but they also have been subjected to the most reworking from deposition, channel cutting, and bioturbation.

At some point, probably in the middle Holocene when lake levels may have been lower, shoreline deposition in the embayment ended. Channel cutting then breached the beach barrier that divided the lake and the embayment (Figure 9). At this point, the hot springs probably flowed through the channel into the lake. A small marsh probably also formed in this area. Finally, during the late Holocene, a beach barrier that was probably dry most of the year formed in the southern portion of the site (Figure 10). Evidence that this area of the site was used during the late Holocene was found in the form of both features and artifacts.

Preservation of the archaeological record at the Elsinore site is a function of the relative stability or instability of the environment. During times of little erosion or deposition, stable landscape conditions promoted both soil development and compression of artifact accumulations. When stability persisted over extended periods of time, cultural material was concentrated on the surface. Bioturbation, however, mixed the artifacts to a significant degree. Animal burrowing was an extremely important postdepositional site formation process that altered the integrity of cultural deposits at the site. Infilled rodent and insect burrows were observed in the excavation profiles, particularly those of the terrestrial deposits. Other evidence of mixing included historical-period pollen recovered in prehistoric cultural
deposits (see Grenda and Hogan 1997) and the translocation of diagnostic Early period beads both above and below the human burial discovered in Locus C. Mixing was also indicated by the lack of correlation between the thickness of hydration rinds on obsidian artifacts and their stratigraphic position (see Towner et al. 1997 and Chapter 5). Although bioturbation undoubtedly affected the position of artifacts within the cultural deposits of the site, stratigraphic integrity certainly prevailed. The recognizable soil horizons and the distinct peaks in artifact density at various depths indicated that the deposits were not thoroughly churned and homogenized. Consequently, stratigraphic integrity clearly dominated over mixing.

**EXCAVATION UNIT DESCRIPTIONS**

Twenty-seven units were hand excavated in areas known to contain archaeological deposits: three 1-by-1-m units, five 1-by-2-m units, 12 2-by-2-m units, two 3-by-3-m units, and one 4-by-4-m unit. Fill from these units was screened through 1/8-inch mesh. In addition, four 0.5-by-0.5-m column samples were excavated as control units to monitor the loss rate of small artifacts. A portion of each level from these columns was floated and the heavy fraction screened through 1/16-inch mesh. Unit 19 (1 by 1 m) was also entirely screened through 1/16-inch mesh. All of the units were placed within the previously established site boundaries. Three units (2, 9, and 13), however, produced few artifacts and were determined to be outside
the site. Approximately 138.5 m$^3$ were excavated. Table 6 summarizes grid coordinates, size, depth, and volume for each unit.

Most of the units were judgmentally placed in areas of high artifact density or in areas where features had been identified, either as seen in a specific segment of a trench or based on knowledge from previous excavations. Units yielded controlled artifact samples of sufficient size to inform on activities that occurred on the site, as well as the spatial and temporal trends of these activities. Features were intensively investigated because they could inform on specific activities. Data from artifacts and features allowed us to link specific artifacts with particular activities. Although our excavations were limited to the project area, most of the site was contained within this boundary, and we hoped that our data would expose spatial patterns and intrasite variability.

Some units contained features that were analyzed separately (the collections from them were not considered part of the larger unit). Because of this an artifact and ecofact count by unit would not reflect the true artifact density for those units. For presentation purposes, numbers of artifacts and ecofacts in specific excavation areas (i.e., adjacent units and features within units) are presented in Table 7. Because many of these units were not analyzed, some of the numbers in the table are approximate.

Our excavations identified 10 features and generated over 32,000 lithic artifacts and approximately 80,000 faunal remains. As noted above, the large number of recovered artifacts and ecofacts necessitated a sampling strategy for the analysis phase of our investigations. The units and levels chosen for analysis are shown in Table 8.
Table 6. Surface Area, Depth and Volume of Units.

<table>
<thead>
<tr>
<th>Unit</th>
<th>SW Corner Grid Coordinate</th>
<th>Surface Area (m²)</th>
<th>Depth (m)</th>
<th>Volume (m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E273/E278</td>
<td>4</td>
<td>1.8</td>
<td>7.2</td>
<td>Locus B</td>
</tr>
<tr>
<td>2</td>
<td>N253/E273</td>
<td>4/2</td>
<td>0.8/0.1</td>
<td>3.4</td>
<td>heavily disturbed, secondary deposits</td>
</tr>
<tr>
<td>3</td>
<td>N308/E275</td>
<td>4</td>
<td>2.6</td>
<td>10.4</td>
<td>Locus B</td>
</tr>
<tr>
<td>4</td>
<td>N273/E297</td>
<td>4</td>
<td>1.8</td>
<td>7.2</td>
<td>Irrigation pipe in SW corner, Locus B</td>
</tr>
<tr>
<td>5</td>
<td>N158/E341</td>
<td>4/2</td>
<td>0.5/0.2</td>
<td>2.4</td>
<td>Locus A</td>
</tr>
<tr>
<td>6</td>
<td>N143/E315</td>
<td>4</td>
<td>1.2</td>
<td>4.8</td>
<td>Locus A</td>
</tr>
<tr>
<td>7</td>
<td>N137/E339</td>
<td>4</td>
<td>0.8</td>
<td>3.2</td>
<td>Locus A</td>
</tr>
<tr>
<td>8</td>
<td>N165/E315</td>
<td>2</td>
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<td>3.0</td>
<td>Locus A</td>
</tr>
<tr>
<td>9</td>
<td>N199/E310</td>
<td>1</td>
<td>0.9</td>
<td>0.9</td>
<td>Between Locus A and B</td>
</tr>
<tr>
<td>10</td>
<td>N373/E290</td>
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<td>2.3</td>
<td>9.2</td>
<td>Locus C</td>
</tr>
<tr>
<td>11</td>
<td>N376/E280</td>
<td>4</td>
<td>2.3</td>
<td>9.2</td>
<td>Locus C</td>
</tr>
<tr>
<td>12</td>
<td>N376/E282</td>
<td>2</td>
<td>1.3</td>
<td>2.6</td>
<td>feature expansion unit, Locus C</td>
</tr>
<tr>
<td>13</td>
<td>N435/E298</td>
<td>4</td>
<td>0.6</td>
<td>2.4</td>
<td>off site (north)</td>
</tr>
<tr>
<td>14</td>
<td>N375/E281</td>
<td>2</td>
<td>1.3</td>
<td>2.6</td>
<td>feature expansion unit, Locus C</td>
</tr>
<tr>
<td>15</td>
<td>N282/E296</td>
<td>9</td>
<td>1.9</td>
<td>17.1</td>
<td>Locus B</td>
</tr>
<tr>
<td>16</td>
<td>N406/E324</td>
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<td>1.8</td>
<td>7.2</td>
<td>stacked metates/modern cat burial, Locus C</td>
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<tr>
<td>17</td>
<td>N398/E300</td>
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<td>1.8</td>
<td>7.2</td>
<td>Locus C</td>
</tr>
<tr>
<td>18</td>
<td>N375/E280</td>
<td>1</td>
<td>0.8</td>
<td>0.8</td>
<td>Historic trash pit/feature expansion unit Locus C</td>
</tr>
<tr>
<td>19</td>
<td>N272/E298</td>
<td>1</td>
<td>1.6</td>
<td>1.6</td>
<td>1/16-inch screen, Locus B</td>
</tr>
<tr>
<td>20</td>
<td>N411/E309</td>
<td>9</td>
<td>1.6</td>
<td>14.4</td>
<td>human remains, Locus C</td>
</tr>
<tr>
<td>21</td>
<td>N165/E316</td>
<td>2</td>
<td>1.5</td>
<td>3.0</td>
<td>Locus A, mortar and pestle</td>
</tr>
<tr>
<td>22</td>
<td>N310/E275</td>
<td>0.25</td>
<td>2.5</td>
<td>0.625</td>
<td>column sample, Locus B</td>
</tr>
<tr>
<td>23</td>
<td>N374/E292</td>
<td>0.25</td>
<td>2.1</td>
<td>0.525</td>
<td>column sample, Locus C</td>
</tr>
<tr>
<td>24</td>
<td>N164.5/E316</td>
<td>0.25</td>
<td>1.2</td>
<td>0.3</td>
<td>column sample, Locus A</td>
</tr>
<tr>
<td>25</td>
<td>N408/E324</td>
<td>0.25</td>
<td>1.6</td>
<td>0.4</td>
<td>column sample, Locus C</td>
</tr>
<tr>
<td>26</td>
<td>N397/E302</td>
<td>2</td>
<td>1.3</td>
<td>2.6</td>
<td>feature expansion unit, Locus C</td>
</tr>
<tr>
<td>27</td>
<td>N289/E295</td>
<td>16</td>
<td>1.2</td>
<td>19.2</td>
<td>Unit terminated prior to sterile, Locus B</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td></td>
<td><strong>143.45</strong></td>
<td></td>
</tr>
<tr>
<td>Units and Features</td>
<td>Flaked Stone</td>
<td>Ground Stone</td>
<td>Faunal Remains (g)</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------------</td>
<td>-----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Unit 1</td>
<td>952</td>
<td>2</td>
<td>58.05</td>
<td>4 crescents, 1 projectile point</td>
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</tr>
<tr>
<td>Unit 2</td>
<td>322</td>
<td>2</td>
<td>61.86</td>
<td>1 crescent, 1 projectile point</td>
<td></td>
</tr>
<tr>
<td>Units 3, 22</td>
<td>1,427</td>
<td>4</td>
<td>834.22</td>
<td>1 crescent, 1 projectile point, 2 beads</td>
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</tr>
<tr>
<td>Units 4, 19</td>
<td>2,458</td>
<td>--</td>
<td>107.50</td>
<td>6 crescents, 2 projectile points</td>
<td></td>
</tr>
<tr>
<td>Unit 5</td>
<td>93</td>
<td>--</td>
<td>11.40</td>
<td>1 uniface, 1 biface</td>
<td></td>
</tr>
<tr>
<td>Unit 6</td>
<td>141</td>
<td>--</td>
<td>20.19</td>
<td>1 projectile point</td>
<td></td>
</tr>
<tr>
<td>Unit 7</td>
<td>257</td>
<td>--</td>
<td>97.13</td>
<td>3 flake tools, 1 biface</td>
<td></td>
</tr>
<tr>
<td>Units 8, 21, 24; Feature 6</td>
<td>235</td>
<td>9</td>
<td>150.63</td>
<td>1 mortar, 1 pestle</td>
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</tr>
<tr>
<td>Unit 9</td>
<td>18</td>
<td>--</td>
<td>34.17</td>
<td>off site</td>
<td></td>
</tr>
<tr>
<td>Units 10, 23</td>
<td>2,399</td>
<td>7</td>
<td>397.04</td>
<td>3 cores, 3 bifaces</td>
<td></td>
</tr>
<tr>
<td>Units 11, 12, 14, 18; Features 1, 2, 4</td>
<td>3,956</td>
<td>24</td>
<td>1,365.39</td>
<td>11 bifaces, 3 crystals</td>
<td></td>
</tr>
<tr>
<td>Unit 13</td>
<td>89</td>
<td>--</td>
<td>15.73</td>
<td>off site, 1 biface</td>
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</tr>
<tr>
<td>Unit 15; Feature 3</td>
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<td>18</td>
<td>313.72</td>
<td>3 crescents, 1 projectile point</td>
<td></td>
</tr>
<tr>
<td>Units 16, 25; Feature 7</td>
<td>1,872</td>
<td>8</td>
<td>1,043.19</td>
<td>2 stacked metates, 1 projectile point</td>
<td></td>
</tr>
<tr>
<td>Units 17, 26; Feature 8</td>
<td>3,954</td>
<td>19</td>
<td>1,561.10</td>
<td>2 bifaces, 2 crystals, 1 bead</td>
<td></td>
</tr>
<tr>
<td>Unit 20</td>
<td>6,746</td>
<td>36</td>
<td>3,212.43</td>
<td>1 burial, 1 crescent, 13 beads</td>
<td></td>
</tr>
<tr>
<td>Unit 27</td>
<td>3,017</td>
<td>16</td>
<td>372.02</td>
<td>1 crescent, 1 projectile point, 1 bead</td>
<td></td>
</tr>
</tbody>
</table>
Table 8. Excavation Units and Levels Analyzed.

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Size (m)</th>
<th>Levels Analyzed for Lithics</th>
<th>Levels Analyzed for Fauna</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>2 x 2</td>
<td>7-26</td>
<td>7-25</td>
</tr>
<tr>
<td>4</td>
<td>2 x 2</td>
<td>1-18</td>
<td>2-15, 17, 18</td>
</tr>
<tr>
<td>8</td>
<td>1 x 2</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>10</td>
<td>2 x 2</td>
<td>4-23</td>
<td>4-14, 16-23</td>
</tr>
<tr>
<td>16</td>
<td>2 x 2</td>
<td>5-18</td>
<td>5, 7-10, 12, 14, 16, 18</td>
</tr>
<tr>
<td>19</td>
<td>1 x 1</td>
<td>1-16</td>
<td>1-16</td>
</tr>
<tr>
<td>20</td>
<td>3 x 3</td>
<td>1-19</td>
<td>1-5, 7, 8, 11, 13, 15, 16</td>
</tr>
<tr>
<td>21</td>
<td>1 x 2</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>22</td>
<td>0.5 x 0.5</td>
<td>7-26</td>
<td>7-25</td>
</tr>
<tr>
<td>23</td>
<td>0.5 x 0.5</td>
<td>4-23</td>
<td>4-21</td>
</tr>
<tr>
<td>24</td>
<td>0.5 x 0.5</td>
<td>5-15</td>
<td>--</td>
</tr>
<tr>
<td>25</td>
<td>0.5 x 0.5</td>
<td>5-18</td>
<td>--</td>
</tr>
</tbody>
</table>

FEATURE DESCRIPTIONS

Ten features were identified at the site. Feature 5 turned out to be a recent domestic cat burial and is not discussed further. A probable trash-filled pit (Feature 2) consisted of historical-period artifacts that were not analyzed because the historical period is outside the scope of our investigations. Finally, Feature 10 was a prehistoric human...
burial that was excavated by a forensic archaeologist from the Riverside County
Coroner's Office (Suchey 1993) and was not analyzed as part of our studies.

All remaining features were completely excavated and flotation or pollen samples,
or both, were taken for further analysis. One feature was located in Locus A, one was in
Locus B, and the other five were encountered in Locus C. Five of these features were
composed of rock clusters containing thermally altered rocks suggestive of cooking
hearth, roasting pits, or "clean-outs" of these features. The other two features (7 and 9)
were composed of stacked metates. As discussed by Homburg and Ferraro (1997), two of
the five investigated features in Locus C (Features 4 and 8) were found in the 2Bwb1 soil
horizon. Feature 1, though found in the C horizon, was sitting at the contact of the C and
2Bwb1 horizons. In addition, Feature 9 and the human burial were also found in the
2Bwb1 horizon. Feature 7 was found in the 3Bwb2 horizon. The other two features were
in different sedimentary facies and different site loci (Feature 3 in Locus B and Feature 6
in Locus A). Each feature is discussed in detail below.

Feature 6 (Locus A)

Feature 6 was encountered in Unit 8, a 1-by-2-m unit placed along Trench 8. At a
depth of 120–130 cm, thermally altered rocks were nested in the east wall. These rocks
were designated Feature 6, and Unit 21 was opened directly to the east to expose the
feature. A mortar and pestle were encountered in Unit 21 at the 60–70-cm level. The
feature was found to extend only slightly into Unit 21. The feature, centered at N165.9/E315.9, measured 47 by 50 cm and was 12 cm deep, extending to a depth of 140 cm. The feature is in Stratum 3 (a C horizon), sitting on decomposing granite in the Closed Lagoon facies (see Homburg and Ferraro 1997:67-68). This was the only feature found in Locus A (Figure 11).

Feature 6 contained 16 thermally altered rocks. The only items recovered from the feature were three lithic artifacts, seven pieces of very small burned bone, and some shell. One pollen sample was taken from the center of the feature (see Grenda and Hogan 1997), but no other soil samples were collected.

Figure 11. Plan map of Feature 6.
Feature 3 (Locus B)

Feature 3 was found in Unit 15 (3 by 3 m) at Level 9 (80–90 cm). It was defined as a feature when a cluster of thermally altered rocks was noted during excavation. At that point a 1-m square around the feature was pedestaled and the feature was excavated separately. The center of Feature 3 was located at N282.3/E297.6. The feature measured 35 by 30 cm and was located between 79 cm and 86 cm below datum, in the C horizon of the Main Site facies. It was excavated in one level (Figure 12).

Feature 3 was composed of thermally altered rocks, including one of granite, one of sandstone, and seven of quartzite. An increase in the number of artifacts was noted in the level associated with this feature (Level 9) when compared to the other levels of this unit (see Chapter 5). Eight ground stone artifacts and 58 flaked stone artifacts were collected. Faunal remains (280 pieces, 9.9 g) consisted mostly of small fragments from small mammals; none were worked. During excavation, 120 liters of fill were bagged for flotation and one pollen sample was collected (see Grenda and Hogan 1997).
Feature 1 (Locus C)

Feature 1 (Figure 13), consisting of a large number of thermally altered rocks and burned soil, was first uncovered in Level 7 (60–70 cm) in Unit 11 and appeared to be the remnants of a hearth. Fist-sized rocks were found scattered between 60 and 70 cm below datum with a concentration in the southeast corner. After the concentration appeared, the
feature was assigned its own provenience and kept separate from the larger unit.

Unfortunately the feature was not recognized until the cluster was defined; the artifacts from the first level of the feature were therefore combined with those from Unit 11, Level 7. Only the larger ground stones were segregated as Feature 1, Level 1.

After the feature was recognized and assigned a number, Unit 12 (1 by 2 m) was opened immediately adjacent to Unit 11 along the eastern wall to expose the rock cluster. Unit 12 was excavated to Level 7. Because the rocks in the south end of this unit appeared to extend to the south and east out of the unit, another unit, Unit 14 (1 by 2 m), was opened to uncover the rest of the feature. At Level 7 in Unit 14, the full extent of Feature 1 was exposed. The center of this feature was located at N376.6/E282.2.

The feature measured 1.75 by 1.50 m and was excavated in arbitrary 10-cm levels. The bottom of the feature was reached at 90 cm below the Unit 11 datum. The feature was located in the C horizon at the contact with the 2Bwbl horizon in the Main Site facies (see Homburg and Ferraro 1997). In all, 117 granite, quartzite, schist, and sandstone rocks were uncovered. All but 14 were thermally altered. The surrounding soil also appeared to be burnt. Field personnel noted the presence of eight ground stone fragments within this feature, all of which were burned. In addition to the 117 rocks that defined the feature, 99 lithic artifacts, including the eight ground stone fragments mentioned above, were encountered. A total of 1,068 pieces of bone (133.9 g) was also collected. Of these, four were worked and about 66 percent were burnt. Most of the bones were small fragments of small mammals (mostly rabbits).
Figure 13. Plan map of Feature 1.
Additionally, 170 liters of fill from Level 2 and 170 liters of fill from Level 3 were collected for macrobotanical analysis. Three pollen samples, two from feature fill and one from a pollen wash of a mano, were also collected. Fragments of woven fibers (presumably from a basket) were found in the flotation sample (see Grenda and Hogan 1997).

**Feature 2 (Locus C)**

Feature 2 consisted of historical-period materials and, thus, was outside of the scope of this investigation. This feature was encountered while excavating Units 11 and 12 to uncover Feature 1. The center of this feature had the approximate grid coordinates of N375.6/E281.4. The feature was probably a trash-filled pit that was dug into the A and C soil horizons but did not extend into the 2Bw1 horizon.

**Feature 4 (Locus C)**

During the excavation of Unit 18 (to expose Features 1 and 2), a rock cluster and hard-packed, thermally altered patches of soil were encountered. The feature was contained in Units 18 and 14 at 114 cm below datum (under Features 1 and 2). This area was designated Feature 4, with an approximate center of N375.7/E281.0.
Once the rock cluster was identified as a feature, it was excavated separately in a unit that measured 1 by 1.7 m. The feature measured 170 by 55 cm and extended from 114 to 133 cm below datum, well into the 2Bwb1 horizon. Because of the large number of rocks, the feature was originally mapped in two layers, which were then combined into one plan view (Figure 14).

The rock cluster consisted of 47 rocks, 39 of which were thermally altered. An increase in the number of artifacts was noted in association with this feature; 111 flaked stone artifacts and 2 ground stone artifacts were collected. Feature fill (204 liters) was removed for flotation sampling, and one pollen sample was collected (Grenda and Hogan 1997). Most of the faunal material came from large mammals, and a fair amount was unburned (Chapter 5). One piece of worked bone was recovered (Strand 1997b).

**Feature 7 (Locus C)**

At a depth of 121 cm in Unit 16, a stack of two metates was found. This cache, designated Feature 7, was centered at N407.5/E324.3; measured 90 by 70 cm; and extended from 121 cm to 137 cm below datum. Feature 7 was found in the 3Bwb2 soil horizon, which is the oldest artifact-bearing stratum on the site (Homburg and Ferraro 1997). The larger of the two metates was located on the bottom (Figure 15).
Figure 14. Plan map of Feature 4.
In addition to the metates, 48 other lithic artifacts were collected from soil immediately surrounding these artifacts. Bone fragments from the feature totaled 381, representing mostly small and very small species (Strand 1997a). Approximately 86 liters of soil were removed from around the metates, and another 5.5 liters were removed from inside the metates for flotation analysis. Two samples were taken for microbotanical analysis: one from under the metates and one from a pollen wash of a metate. Another pollen sample was collected from the southeast corner of Unit 16 from the same depth as the feature to serve as a comparative sample (see Grenda and Hogan 1997).

Figure 15. Plan map of Feature 7.
Feature 8 (Locus C)

While digging Level 12 (110–120 cm) in Unit 17, a cluster of rocks was encountered in the southeast corner of the unit and appeared to extend southeast out of the unit. It was designated Feature 8, and Unit 26 was opened to the east and south of Unit 17 to expose the feature which was then excavated separately. The feature measured 40 by 75 cm, was located between 110 and 130 cm below datum (in the 2Bwb1 horizon), and was centered at N398.0/E302.4 (Figure 16). Between 15 and 20 thermally altered rocks were noted. Field personnel described the feature as mostly intact because the rocks were close together. About 176 liters of feature fill were collected for flotation analysis, and three pollen samples were analyzed. Lithic artifacts consisting of 171 flaked stone and 2 ground stone artifacts were recovered, along with 1,589 bones (153.5 g) from mostly small and very small species.
Feature 9 (Locus C)

Feature 9 consisted of four metates found during mechanical excavation of Trench 12. Two were in place when they were found and the other two were found in the backdirt. The two in place were found near the bottom of the trench at a depth of 147–165 cm below the surface in the 2Bwb1 horizon of the Main Site facies (Homburg and Ferraro 1997), near some thermally altered rocks. About 2.4 liters of soil were taken from inside the lower metate for macrobotanical analysis. Another five samples were taken for microbotanical analysis. No flaked stone artifacts were associated with this feature, and only five pieces of bone were recovered.
Feature 10 (Locus C)

Feature 10 is a human burial that was found in Unit 20 at approximately N411/E311.7. Human remains were found at a depth of between 130 and 160 cm in the 2Bwb1 horizon. Although many different types of artifacts were found in this unit before the burial was encountered, none were found to be in direct association with the scattered remains. This feature is more fully described in the coroner's report (Suchey 1993).

SUMMARY OF FIELD RESULTS

The data recovery program confirmed that the portion of the site in the project area was a deeply stratified, multicomponent habitation site with a large variety of artifacts and ecofacts. Mechanical and manual excavations served to reinforce and tighten previous site boundaries, provide an understanding of site stratigraphy, and describe the nature of the features found at the site.

Geoarchaeological investigations, trenching, and hand excavation resulted in the designation of three loci based on differences in artifact densities and types. In all, 27 units were hand excavated. Twelve of these units were located in the northern area of the site (Locus C). During the course of trenching and excavating, 10 features were encountered, seven of which were also located in Locus C.
The number of units and features excavated was more than sufficient to provide data with which to address the research questions. The flotation and pollen analyses are discussed in Grenda and Hogan (1997). Various aspects of the faunal analyses are provided in Strand (1997a, 1997b). The shell and shell bead collections are discussed in Grenda (1997:161-166). Lithic analyses are provided in Towner et al. (1997). Syntheses and conclusions concerning the materials from this site are the subject of Chapter 5.
CHAPTER 5

THE OCCUPATIONAL HISTORY OF THE ELSINORE SITE:
SUBSISTENCE AND SITE STRUCTURE

This chapter represents an integration of the various pieces of information obtained from the field and from laboratory work on the Elsinore site. This integration involves the evaluation of the archaeological formation processes discussed in Grenda (1997:31-45), Homburg and Ferraro (1997), and Chapter 4 to establish inferences about the prehistoric human behaviors that occurred at the site. The chapter begins with a discussion of site structure focusing on the temporal context, feature types, distributional patterns, and midden constituents of each locus. Results from the various analyses of collections from the site are correlated. Correlations between artifacts and ecofacts are analyzed, and differences between the amount of small debitage in the peaks and valleys are tested for significance.

This discussion serves as the basis for intrasite comparisons and the overall interpretation of the site. The interpretation addresses issues such as site function, activity areas, and the effect of differing lake levels on site inhabitants. I begin with an examination of site structure focusing on the differences between loci. Each locus is discussed in detail, and artifact and ecofact distributions are examined. The chapter concludes with a discussion of trans-Holocene stability and change at Lake Elsinore.
After presenting my interpretation of the site, issues such as settlement, subsistence, and technological and social organizational change are explored.

SITE STRUCTURE

The Elsinore site is located on the shore of Lake Elsinore and parallels the outlet channel of the lake for approximately 400 m. Throughout prehistory the level of the lake has had a profound effect on site use and site formation, and at times has dictated what portions of the site were available for use. For example, Homburg and Ferraro (1997) suggest that during the early and middle Holocene, only Loci B and C were available for settlement. Figure 17 shows the site during the largest flood on record at Lake Elsinore, and may be a good indication of the site’s location in relationship to the lake during the early and middle Holocene. (See Figure 4 for comparative purposes.) During the late Holocene, the southern portion of the site consisted of a barrier beach that was probably dry most of the year but was subject to flood episodes associated with winter and spring rains. Not surprisingly, activities at this time shifted to the south (Locus A).
Figure 17. Enlarged aerial photograph of the 1980 flood at the Lake Elsinore outlet channel
Formation Processes

As Schiffer (1987:11) outlines, and the analyses at the Elsinore site demonstrate, complex formation processes (1) transform the artifacts and ecofacts within the site formally, spatially, quantitatively, and relationally, and (2) create patterns in the archaeological record that are unrelated to past human behaviors. Historical period activities such as the construction and destruction of a hotel on the site, the construction of the baseball field complex on the west bank of the outlet channel, and the construction of streets, houses, and utility lines have all affected the site, but are relatively simple to discern in the archaeological record. Although most of the site in the disturbed areas has either been removed or destroyed, the content of private collections (see Lerch and Smith 1984:10–12) allows for speculation on the content and structure of those areas.

The most problematic set of formation processes are those that served to mix archaeological deposits over the last 8,000 years (see Homburg and Ferraro 1997). These processes include wave action from the lake, fluctuating lake levels, flood episodes that caused erosion of the outlet banks, bioturbation, and varying rates of sedimentation. These factors worked together to homogenize the record and blur the distinctions between the different groups that used the site. This project went to great lengths to identify and control for these processes so we could develop inferences.

Clearly the most difficult problem, and the focus of the investigations, concerned the interpretation of the prehistoric human behaviors that contributed to the formation of
the archaeological record. To address these cultural processes an attempt was made to identify as many natural and cultural formation processes as possible. The study of site stratigraphy and local geomorphology (Homburg and Ferraro 1997) served as the point of departure for my interpretations.

Relatively early in the fieldwork, we found that the site could be divided into south (A), middle (B), and north (C) loci. Based on field observations of diagnostic artifact types, we felt that the northern portion of the site represented a middle Holocene (Pauma) component, the middle portion represented an early Holocene (San Dieguito) component, and that the south represented a middle or late Holocene (San Luis Rey) occupation. Although chronometric analyses and corroborative stratigraphic evidence have shown that Locus A is entirely a late Holocene occupation, our initial observations were, with minor refinements, relatively accurate. After the analyses were complete we redefined our thoughts and now follow Schiffer's (1987:100–103) behaviorally relevant system for classifying occupation sites according to their length of occupation rather than the number of "components" present. Employing this system, Locus A was the focus of a late Holocene (probably from the SLR I period) recurrent extended visitation. Locus B was a mixed occupation primarily representing part of a recurrent, extended early Holocene encampment but with late and middle Holocene occupations that were difficult to define. Locus C clearly was the site of a large middle Holocene recurrent habitation superimposed on an earlier deposit related to Locus B. Locus C was probably capped by a later component that was difficult to define.
To explore the data for indications of occupation episodes a number of independent lines of evidence are examined below. First, I consider what occupation episodes should look like in the archaeological record and establish where this pattern is present. My initial hypothesis was that occupation episodes should be visible in the record as high artifact and faunal densities at particular excavation levels. In addition, these high density levels should correlate with features, tools and ground stone. Unfortunately, features are rare, and other formation processes can create change in artifact densities.

At a location like the Elsinore site, sorted deposits are created by wave action when water flows over the surface and reworks the sediments, oftentimes removing the small artifacts and faunal remains. The remaining matrix collapses into a lower level, creating an increase in artifacts and ecofacts, and leaving a pattern similar to our description of an occupation episode. To control for wave action, we must look for co-occurrence between peaks in cultural material and the presence of small artifacts. Fortunately, relatively fine resolution size-class data were available on a large data category—lithic debitage. Other indicators of occupation surfaces include a high proportion of weathered bone, an indication that material remained on the surface for an extended period of time. These data are available for a large portion of the faunal collection.

To analyze the different amounts of small debitage between suspected occupational levels and levels where there was no evidence of occupational use, the $t$ test
was calculated. Using Quattro Pro, a two-sample Student's $t$ Test for means using two independent samples with unequal variance was performed. The $t$ test tests the hypothesis that the means for the amount of small debitage in one level compared to another are equal. The $t$ test for equal means across the small debitage distribution is then performed in order to strengthen the argument that occupational levels exist. If the test results show significant outcomes, this implies that the two sample means are different—that is, that the amount of small debitage in one level is statistically different from the level it was tested against. Taking into consideration the small sample sizes in most of the levels, which decreases the power of any test used, a somewhat strict $\alpha = .05$ was used. The statistically significant results are based on smaller than suggested sample sizes and although only values of $p < .05$ are accepted, there is still a 5 percent chance that the differences occurred because of chance.

Other processes that blur our resolution include bioturbation, which mixes the deposits and diffuses the material through the midden, and the excavation process itself, which was conducted in 10-cm arbitrary levels. Although the use of arbitrary levels was the only practical way to excavate a site of this nature (i.e., where stratigraphy is extremely difficult to discern in the field), the levels do not relate to stratigraphic units, causing mixing of materials that occur at the contact between strata. Also 10 cm may be an inappropriate level of analysis to discern changes in the density of cultural remains within a unit. With these caveats in mind, the following analyses attempt to discern occupation episodes across the site and to expose patterns in the artifact and ecofact
assemblages. Our discussions using standardized densities are based on the volume of sediment excavated. Our densities are standardized to 0.1 m$^3$. This corresponds to the excavation of one level in a 1-by-1-m unit.

**Locus A**

Locus A was located in the southern portion of the site near the lake. Although the southern and eastern boundaries of this locus were undefined, the northern boundary was between Unit 9 and Trench 7, and the western boundary was the outlet channel. Chronometric analyses indicated that this locus represents a Late Prehistoric period of occupation probably between A.D. 1400 and 1750. The locus yielded a relatively low density of lithic artifacts, one feature consisting of thermally altered rocks (Feature 6), and a mortar and pestle that were cached and later buried by a flood event.

**Temporal Context**

Two radiocarbon assays of charcoal (unidentified species) were conducted for Locus A (see Table 5). Both samples were found in Unit 21. The first was located in Level 11 (100–110 cm below surface), clearly within Stratum 3 (a C horizon representing rapid deposition) of the Closed Lagoon facies. This stratum was deposited in a lagoon shoreline context that formed when the lake was at a lower level than the previous Main
Site facies (see Homburg and Ferraro 1997). An extended count radiocarbon assay was conducted on this charcoal sample and returned a date of $390 \pm 120$ B.P. that calibrated to A.D. 1425–1650. The second sample was recovered from Level 8 (70–80 cm below surface), within Stratum 2b of the Closed Lagoon facies. This stratum consisted of a barrier between the lake and the lagoon. An AMS date on the small charcoal sample returned a date of $180 \pm 50$ B.P. that calibrated to A.D. 1650–1950. These dates are stratigraphically consistent.

In addition to the radiocarbon assays, one piece of obsidian was submitted for sourcing and hydration readings. The obsidian flake was recovered from Unit 21, Level 15 (140–150 cm below surface) well within Stratum 3 of the Closed Lagoon facies. This obsidian was sourced to the Obsidian Butte outcrop near the Salton Sea and returned a hydration reading of 2.3 microns. Obsidian from this source is commonly found at Late Prehistoric sites in southern California and is thought to have become available only at times when the Salton Sea (Lake Cahuilla) was at low water levels (Hughes and True 1985; Wilke 1978).

The radiocarbon assays date the locus no earlier than the San Luis Rey I period (A.D. 1400–1750). The obsidian source and hydration readings appear to be consistent with this interpretation. The lack of ceramics at the locus probably indicates that it predates the San Luis Rey II period, which is well dated to A.D. 1750–1850 (True et al. 1974). Together, these factors place the date of Locus A between A.D. 1400 and 1750.
Feature Types

Feature 6 was discovered in Level 13 of Units 8 and 21. This feature consisted of a small cluster of thermally altered rocks (n = 16). A small number of lithic artifacts (n = 3) and faunal remains (n = 7) indicates that the feature was either a hearth clean-out, was minimally used, or suffered the effects of a flooding or other formation process that removed most of the smaller artifacts and ecofacts. No soil was collected from this feature for flotation analysis and the pollen sample returned no clear indicators of feature use. The pollen concentration of the feature fill (n = 10,682 gr/cc) was extremely high in comparison to other site samples, however, and indicates possible flood activity (see Grenda and Hogan 1997:113).

The hypothesis that Feature 6 represents a hearth that was washed out by a flood episode is consistent with our geomorphic reconstructions and stratigraphic interpretation of Locus A, which shows ample evidence of overbank deposits and high lake stands. Additional supporting evidence comes from the extremely high pollen concentration on the mortar (n = 18,232 gr/cc) and pestle (n = 173,058 gr/cc) found in Level 8 of Unit 21 that indicates they were buried by a flood event.
Distributional Patterns

Although our sample size from Locus A was the lowest at the site both in terms of square meters (n = 16.25) and cubic meters (n = 16.7) excavated, the sample was large enough to determine that the locus represents a series of small, short-term (probably a few days) visitations. All of the units excavated in this locus yielded a low density of both lithic and faunal materials (Table 9) and the density is relatively homogeneous across the locus. A possible area of more-intense use occurred around Unit 7, where the lithic density is more than twice that of the other units, and the faunal yield is also greater.

Table 9. Flaked Stone and Faunal Densities for Units in Locus A.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Size (m)</th>
<th>Level Excavated (10 cm)</th>
<th>Flaked Stone Total</th>
<th>Faunal Weight (g)</th>
<th>Density of Lithics/Faunal per 1 m² x 10 cm (0.1 m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2 x 2/1 x 2</td>
<td>5/2</td>
<td>93</td>
<td>11.4</td>
<td>3.88/0.48</td>
</tr>
<tr>
<td>6</td>
<td>2 x 2</td>
<td>11</td>
<td>140</td>
<td>20.19</td>
<td>3.20/0.4</td>
</tr>
<tr>
<td>7</td>
<td>2 x 2</td>
<td>8</td>
<td>257</td>
<td>97.13</td>
<td>8.03/3.04</td>
</tr>
<tr>
<td>8/21/24</td>
<td>1 x 2/1 x 2/.5 x .5</td>
<td>15/15/12</td>
<td>235</td>
<td>150.93</td>
<td>3.73/2.40</td>
</tr>
</tbody>
</table>

This locus represents a series of relatively short-term visitations, with the material being reworked by wave action and flood episodes that served to homogenize the deposit. Because only one feature was encountered, it yielded little information about the
distribution of features across the locus. Additional features representing single-use hearths may be present in Locus A.

To identify patterns we must compare units from the same sedimentary facies (see Homburg and Ferraro 1997). Two facies exist in Locus A, the Hotel Hill facies (found in Units 5 and 7) and the Closed Lagoon facies (found in Units 6, 8, 21, and 24). The feature was found in the Closed Lagoon facies.

Hotel Hill Facies

A comparison of Units 5 and 7 is difficult, because the top 20 cm in both units consisted of fill. After the top two levels are eliminated, Unit 5 had only three levels with cultural deposits, and Unit 7 had only five. One peak in the density of faunal material is seen in Unit 5, Level 3 (Figure 18a) and two are seen in Unit 7, at Levels 2 and 5 (Figure 19a). Unit 7 also has peaks in the occurrence of debitage at Levels 3 and 5.

Accounting for flood episodes that leave sorted deposits (see Homburg and Ferraro 1997) in the archaeological record is difficult in Units 5 and 7. Although the sample sizes from Unit 5 are extremely small, a relationship exists between the faunal material and debitage at Level 3. Small debitage (size category 1, see Towner et al. 1997), however, are not present in the lithic peak (Figure 18b). The sample from Unit 7 was slightly larger, and the patterns were slightly stronger. Whereas small debitage is virtually absent in Level 5 (Figure 19b), a correlation of .52 is found between the peak in faunal
Figure 18. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 5).
Figure 19. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 7).
materials and the peak in debitage. The presence of a faunal peak that fails to correlate 
\(r = -0.02\) with a high percentage of small debitage may indicate that small debitage was not produced in this area during this occupation episode (Figure 19b). Level 3 in both units had a relatively high level of lithic artifacts and faunal remains perhaps indicating an occupation episode.

Closed Lagoon Facies

Two areas, containing four units (6, 8, 21, 24), were excavated in the Closed Lagoon facies of Locus A. Although a lack of comparable stratigraphy prevents comparisons between the units, and the density of cultural materials was relatively low, the deeper deposit led to a larger sample size for comparisons and pattern recognition. Unit 6 had a peak in the density of debitage and faunal remains at Levels 6 and 7 and a projectile point was present in Level 6 (Figure 20a). Few pieces of small debitage were present in these levels, however, (Figure 20b), perhaps indicating a lack of biface production and tool maintenance in this area. Because the density of artifacts was extremely low, this inference is highly speculative.

The combined artifacts from Units 8, 21, 24, and Feature 6 provide a more reasonable sample size and some interesting patterns are visible. Co-occurrence between the peaks in faunal remains and lithic debitage are seen at Levels 5–8 and Levels 11–15 (Figure 21a) indicating occupational episodes. The first episode is accompanied by a
Figure 20. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 6).
Figure 21. A comparison of an artifact and ecofact area graph to debitage size class data (Units 8, 21, 24, and Feature 6).
feature and a core in Level 13 as well as ground stone artifacts. A t test was performed to look for possible differences in size-class distribution between the period of decreased use as seen in Levels 9 and 10 and the period of increased use evident in Levels 5–8. The results show significantly less small debitage present in the valley as compared to the peak \( (p = .0259) \). A mortar and pestle were apparently cached in Level 8 and were probably buried by a flood. The flood may account for the drop in artifacts at Level 4. The presence of small debitage (Figure 21b) and weathered bone in the two peaks in artifact density imply that these increases may reflect a period of relative stability and low deposition. In fact, there is no significant difference \( (p = .846) \) in the amount of small debitage found between the two peaks, confirming the relative stability.

**Locus Function and Interpretation**

Radiocarbon assays and a lack of pottery indicate that a short period of time is represented in Locus A. During this time, however, relatively deep sediments were deposited. This fits with the interpretation that the region had frequent flood events similar to those documented in the historical period (Ahlborn 1982). The larger floods occurred during the winter and early spring months and routinely inundated the southern portion of the site. Inundation of the southern portion of the site is clearly shown in the 1980 aerial photograph (see Figure 17).
Based on the low density of artifacts, short period of time represented, and relatively unstable nature of the sediments, Locus A was apparently used as an activity area, not a habitation site. Locus A was probably a resource procurement area for inhabitants of a local village site. The distribution of artifacts was interesting: ground stone artifacts appeared only in Units 8, 21, and 24, and Feature 6, all in the same excavation block. Only one lithic tool (a projectile point) was present in these units. The other units were separate from this block and from each other and produced nine lithic tools. This may indicate that the site was used by different task groups at different times of the year.

The mortar and pestle were probably cached after being used to process sea purslane and acorns (Grenda and Hogan 1997:113), which are both fall crops. The owners of these tools were probably not present during the fire that burned through the area later that fall (as indicated by the burnt seeds and burning on the ground stone). If the fire was caused by drought, much of the vegetation on the local hillsides could have been stripped, increasing the intensity and damage of winter floods. These floods could have buried the mortar and pestle.

At other times, Locus A may have served as a faunal procurement site. The presence of water and lagoon vegetation probably attracted small animals, thus providing an excellent place to procure game. This type of site use probably took place throughout the year. This type of temporary site use may explain the relatively small collection of Late Prehistoric materials that were scattered across the rest of the site.
Locus B

Locus B is located in the middle portion of the site where an early Holocene beach existed (see Homburg and Ferraro 1997). The northern boundary of this locus is Limited Avenue, the southern boundary is between Unit 2 and Trench 7, the outlet channel forms the western boundary, and the toe of the slope of Hotel Hill forms the eastern boundary. Chronometric and artifact analyses indicate that this locus represents an early Holocene recurrent extended encampment but also had late and middle Holocene occupations that were difficult to characterize. Most of the deposits probably date between 8500 and 6000 B.P., but bioturbation, wave action, and other formation processes associated with a beach environment have clearly moved later period artifacts into the early Holocene sediments. The locus yielded a moderate to high density of lithic artifacts, a collection of 18 flaked stone crescents (see Towner et al. 1997:202-208), a thermally altered rock feature, and a moderate amount of faunal remains.

Temporal Context

Four radiocarbon assays, two of bone collagen (extracted from large mammal bones) and two of marine shell were conducted for Locus B (see Table 9). One of these samples was from Unit 1 and three were from Unit 3. The marine shell sample from Unit 1 was located in Level 16 (150–160 cm below surface), within the 2Bwb1 soil horizon of
the Main Site facies. This stratum was deposited in a lakeshore context that formed when
the lake was consistently at a higher level than subsequent periods (see Homburg and
Ferraro 1997). An AMS radiocarbon assay was conducted on this shell sample and
returned a date of 8400 ± 60 B.P. that, adjusted for local reservoir correction, calibrated to
6630 B.C.

The three samples from Unit 3 returned evidence of sediment mixing and
problems associated with excavating the extremely sandy unit. The deepest sample was
recovered from Level 22 (210–220 cm below surface), at the contact between Stratum 1
and 2 of the Main Site facies. This bone collagen sample returned an AMS date of 40 ± >
60 B.P., which has no intercept with the calibration curve and is essentially modern. The
next sample was recovered from Level 18 (170–180 cm below surface), well within the C
horizon. This shell sample returned an AMS date of 590 ± 60 B.P. that, adjusted for local
reservoir correction, also failed to intercept the calibration curve. The last submitted
sample was recovered from Level 7 (60–70 cm below surface), within the A horizon. An
AMS date on this bone collagen sample returned a date of 150 ± 60 B.P. that calibrates at
1 sigma to A.D. 1670–1950.

Clearly the samples from Unit 3 returned unexpected dates. Two hypotheses can
explain the essentially modern dates returned from this unit: (1) the material is
prehistoric, but contamination from the hot springs and processes associated with
inundation has created dates that are much younger than expected; or (2) the material is
intrusive to the older soils through mixing, excavation problems, or both. Both
hypothoses could explain these dates; clearly, they do not accurately date the lower deposits in Unit 3. We submitted several bone samples with the two that returned the modern dates. None of the other samples contained datable collagen—a deficiency that could well have been caused by leaching.

Contamination during excavation is extremely likely. We recognized contamination problems associated with excavating materials in sandy soils over 2 m deep, but not until the dates were returned did we realize the level of contamination. The dates, therefore, most likely accurately date the material, which was essentially the modern hotel debris that was encountered in the upper levels of the unit. Initial sorts of historical-period sawn bone and the presence of historical-period artifacts appeared to indicate that the contamination was confined to the upper six levels. Although this is probably true for most of the materials recovered, we had serious problems with wall collapses and slumpage.

The particular bone samples were chosen from radiocarbon dating because they were large enough to contain adequate amounts of collagen for the extraction process. We now recognize, based on the faunal analyses, that most of the prehistoric bone from the site is relatively small, because of the processing methods used by the inhabitants (see Strand 1997a). Had we conducted the dates after the completion of the faunal analyses, we would have recognized this error in our sampling method. The shell sample from Unit 3 was similarly chosen based on its size and returned a date that may reflect an extremely late or Protohistoric use of the site. We believe, however, that we could have easily
chosen a shell sample that would have returned an early or middle Holocene date. It is unfortunate that most of the materials that were of datable size and in stratigraphic sequence were from Unit 3.

The shell sample from Unit 1 presented a date much more in line with the majority of the lithic assemblage found in this locus. We believe this date corroborates our interpretation, based on the lithic assemblage, that there was an early Holocene occupation at the site. We realize that one date is a poor sample, but also realize that the mixing of small sediments (including small artifacts and ecofacts) makes absolute dating on the site extremely difficult. Clearly the best samples would have come from the feature in Locus B. Unfortunately the bones from Feature 3 were small and dating would have required the submittal of multiple bones to create a single sample. We believed this would introduce an entirely new problem. Additional dates from this portion of the site would be helpful in demonstrating the presence of early Holocene deposits, but they probably will not produce consistently early dates.

In addition to the radiocarbon assays, seven pieces of obsidian were submitted for sourcing and hydration readings. Obsidian flakes were recovered from Unit 15, Levels 3, 9, 13, and 14; Unit 3, Level 4; Unit 19, Level 9; and Unit 27, Level 7. Unfortunately the sample from Unit 27 was from an unknown source and the sample from Unit 19 was from the Coso source but was too weathered to determine the size of the hydration rind. The deeper three samples from Unit 15 were well within the C horizon of the Main Site facies; the uppermost sample was from the A horizon. Unfortunately, only one piece was
large enough to be positively sourced. This flake, from Level 9, was sourced to the Coso Volcanic Field and returned a hydration reading of 15.7 microns. The flakes from Levels 13 and 14 may also be from Coso but did not produce larger hydration rinds (11.8 and 8.8 respectively). Finally, the flake from Unit 3, Level 4 was sourced to Obsidian Butte and had a rind thickness of 4.4 microns. This flake may be the only piece clearly dating to a broad cultural period (Late Prehistoric period). Unfortunately, the late Holocene portion of the deposit is only a minor component of Locus B.

The radiocarbon assays and obsidian hydration data corroborate our belief that the deposits in Locus B have been reworked by wave action and bioturbation. In addition, contamination during excavation of Unit 3 produced dates that clearly postdate the prehistoric cultural deposit. The one early Holocene date returned from Unit 1 is encouraging but it is hard to build a convincing argument around one date. Fortunately, a significant portion of the tools in the lithic assemblage from this area date to the early Holocene. Crescents are reasonably well dated to between 6000 and 9000 B.P. (see Towner et al. 1997:240-241).

**Feature Types**

One small feature was discovered in Unit 15, Level 9. Feature 3 consisted of a small cluster of thermally altered rocks (see Figure 12). Several lithics ($n = 58$), ground stone ($n = 6$), and faunal remains (9.9 g) indicate that the feature was probably relatively
undisturbed. Small lithic debitage and small bones provide additional evidence that the feature was minimally disturbed. Flotation and pollen samples from the feature indicate that *Sesuvium* and other composites were processed in this feature. Because *sesuvium* is available in the fall, this may be a good indication of the season of use.

Comparing the patterns of faunal composition in the feature to the other units in Locus B provides some interesting data that may indicate feature use. A comparison of the standardized bone weights (Figure 22a) demonstrates that the animals targeted in this feature were small mammals (primarily rabbits). When the amount of burnt bone in the feature is compared to the rest of the locus (Figure 22b), however, a different pattern emerges. Although more bones of other animals were likely to be found in the general Locus B deposit, bones in the feature were more likely to be burnt. These facts have important implications for the distributional patterns of Locus B.
Figure 22. A comparison of bone weight and percentage of burnt bone between Locus B midden and Feature 3.
Distributional Patterns

The excavation sample size from Locus B was the largest at the site both in terms of square meters ($n = 44.25$) and cubic meters ($n = 66.73$) excavated, and is large enough to interpret the locus as a portion of a larger recurrent extended habitation site. All units in this locus were within the Main Site facies and yielded a relatively high density of lithic artifacts and a relatively low density of faunal materials (Table 69). The faunal density in Unit 3 was inflated by the presence of historical-period bones in the top seven levels.

The density of cultural material increased with the actual surface elevation of the locus. This is because units at lower elevations (Units 1 and 3/22) were subjected to more-intense wave action. This association between elevation and artifact density is also evident in Unit 2 (outside of Locus B) where the standardized density of lithic artifacts was 9.47, much lower than the units in Locus B (see Table 10). The cultural material in Unit 2 was considered to be a secondary deposit removed from Locus B and redeposited through wave action.
Table 10. Flaked Stone and Faunal Densities for Units in Locus B.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Size (m)</th>
<th>Level Excavated (10 cm)</th>
<th>Flaked Stone Total</th>
<th>Faunal Weight (g)</th>
<th>Density of Lithics/Faunal per 1 m² x 10 cm (0.1 m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 x 2</td>
<td>18</td>
<td>952</td>
<td>58.05</td>
<td>13.22/0.81</td>
</tr>
<tr>
<td>3/22</td>
<td>2 x 2/.5 x .5</td>
<td>26/26</td>
<td>1,427</td>
<td>834.22</td>
<td>12.91/7.55</td>
</tr>
<tr>
<td>4/19</td>
<td>2 x 2/1 x 1</td>
<td>18/16</td>
<td>2,458</td>
<td>107.50</td>
<td>27.93/1.22</td>
</tr>
<tr>
<td>15</td>
<td>3 x 3</td>
<td>19</td>
<td>3,331</td>
<td>303.82</td>
<td>19.48/1.78</td>
</tr>
<tr>
<td>27</td>
<td>4 x 4</td>
<td>11</td>
<td>3,017</td>
<td>372.02</td>
<td>17.14/2.11</td>
</tr>
</tbody>
</table>

Unit 1

An examination of the distributional data presents some interesting patterns. Unit 1 had four distinct peaks in debitage density at Levels 4–6, 8, 11, and 17 (Figure 23a). Testing for differences among the peaks and valleys, it was discovered that the cluster at Levels 4–6 had significantly more artifacts and ecofacts than the valley occurring at Level 7 (p = .003). Based on the lack of correlation (r = .10) between these peaks and small debitage (Figure 23b), weathered bone, and/or faunal remains, all of these increases in debitage appeared to be the result of reworking through wave action. These results are consistent with the interpretation that waves reworked the lower elevation units (see Homburg and Ferraro 1997). Small lithics present in the deepest levels may suggest that these levels were minimally reworked. A lack of faunal material in these levels, however, indicates that this area may have witnessed only minimal use. The peak at Level 17 was
**Figure 23.** A comparison of an artifact and ecofact area graph to debitage size class data (Unit 1).
probably caused by rodent burrowing that was blocked from going deeper by the presence of the extremely compact Bt soil horizon.

Patterns present in Units 4/19, 15, and 27 may be more informative because they were all in similar locations along the base of Hotel Hill where only the most severe storms may have reworked the sediments. In Unit 4/19, peaks are seen in the debitage at Levels 5, 7, 9, 11, and 13–15. In Unit 15, peaks are visible at Levels 3 and 4, 9, 12, and 14. In Unit 27, peaks are seen in Levels 1–4, 6, 7, and 10. Each of these units are discussed in detail below.

Unit 4/19

Although peaks in lithic density occurred in Unit 4/19, the nature of the graph is perhaps more interesting (Figure 24a). The relative absence of small debitage, tools, weathered bone, and faunal material may fit the pattern of a sorted deposit created by flood events. Most of the levels between 3 and 15 contained small amounts of small debitage (Figure 24b) and a relatively consistent amount of faunal material. Level 5, which had a relatively large amount of small debitage and faunal remains, was the one exception to this trend. Lithic tools were apparently present primarily in the deeper levels. Minor amounts of weathered bone were found throughout the unit and may indicate short-term stability of the landscape (see Homburg and Ferraro 1997; Strand 1997a).
Figure 24. A comparison of an artifact and ecofact area graph to debitage size class data (Units 4 and 19).
Unit 15

Although Unit 15 displayed peaks in lithic debitage at Levels 2–4, 9, 12, and 14, the most interesting peak is the one at Level 9 (Figure 25a). When testing the size-class debitage distribution between the first peak and the valley at Levels 5–7, a t test concluded that there was significantly more small debitage in the peak ($p = .024$). Level 9 enhances the strong relationship ($r = .6$) between the amount of ground stone, faunal remains, lithic debitage, and small debitage (Figure 25b). The interpretation of this level as an occupation surface is strengthened by the presence of Feature 3 at this same level. The dip in artifacts, small lithics, and fauna seen in Level 13 is probably the result of a flood episode that obscures a relatively extended occupation represented between Levels 12 and 14. The extreme drop in lithic debitage seen in Level 6 is intriguing because of the lack of a similar decline in faunal material. This decline in debitage was also accompanied by a peak in lithic tools and ground stone. This may represent a single processing event.
Figure 25. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 15 and Feature 3).
Unit 27

Because excavation was suspended prior to the completion of Unit 27, distributional patterns were visible for only 110 cm of a deposit that would have reached a depth of approximately 180 cm. The faunal peak in Level 1 is probably from historical-period bone. Clusters of artifacts and ecofacts were visible throughout the unit (Figure 26a) and small debitage was relatively consistent in all levels (Figure 26b). Like Unit 15, the most interesting level was Level 9. In Unit 27, however, the interesting aspect of Level 9 is the relative lack of artifacts and ecofacts present. The presence of small lithics and fauna suggests a decline in the use of this area rather than a flood episode. This may indicate that the spike seen in Unit 15, Level 9, is a localized short-term event connected with the use of Feature 3, rather than a period of intense use across the site.

Locus Function and Interpretation

One radiocarbon assay and the presence of flaked stone crescents throughout the deposit indicate that Locus B was occupied primarily during the early Holocene. The presence of a Desert Side-Notched projectile point on the surface and a Protohistoric shell bead in Unit 27, Level 3 indicates that this area also saw limited late Holocene use. Although there is no evidence for a middle Holocene occupation, we suspect that some of the artifacts in Locus B date to this period.
Figure 26. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 27).
Perhaps more informative than the coexistence of artifacts and ecofacts within and between units is the patterns seen in the overall bone weight and burnt bone percentages in the units compared to Feature 3 (see Figure 22). The higher standardized bone weights in the excavation units without features (as compared to Feature 3), and the relatively low overall percentage of burnt bone in the units, suggest animals were processed in this area but rarely cooked, eaten, and disposed of in this locus. A lack of meat bearing elements from large ungulates in this locus (Strand 1997a) corroborates this hypothesis. Based on the high density of flaked stone tools, a relatively low number of features, and the unstable nature of most of Locus B, it is reasonable to conclude that the area would not have served as a habitation site for any extended length of time. Rather, it is likely that Locus B was a faunal resource-processing area for people who lived in the more stable area away from the lakeshore (Locus C). Although a few flood episodes were evident in the deposits at the base of Hotel Hill, as a whole, the cultural deposit appears to be located on a relatively stable beach. The local environment probably attracted small game, waterfowl, and other animals, and would have been an extremely good settlement location. The episodic nature of the deposit suggests relatively short-lived, intense occupations of perhaps a season or less. Locus B also suggests that a division of labor based on task specific activities existed during the early Holocene. Domestic activities appear to be concentrated in Locus C. This hypothesis is explored in greater detail below.
Locus C

Locus C is located in the northern portion of the site where an early Holocene beach existed (Homburg and Ferraro 1997). The northern boundary of this locus is between the northern end of Trench 12 and Unit 13, the southern boundary is Limited Avenue, the western boundary is the outlet channel, and the eastern boundary is the northern extent of Hotel Hill. Although chronometric analyses indicate that this locus represents a middle Holocene occupation, the geomorphologic reconstruction (see Chapter 4) indicates that the stratigraphic sequence is contemporaneous with Locus B. Most of the deep artifacts date to the early Holocene, but smaller artifacts have moved into the deposits through bioturbation processes. The locus yielded highly diverse and extremely dense lithic and faunal assemblages, two ground stone caches (Features 7 and 9), one crescent, a human burial (Feature 10), and three thermally altered rock features (Features 1, 4, and 8).

Temporal Context

Two radiocarbon assays, both from marine shell samples, were conducted for Locus C (see Table 5). One of these samples was from Unit 16 and the other was found in Unit 20. The shell from Unit 16 was located in Level 15 (140–150 cm below surface), within the 3Bwb2 soil horizon of the Main Site facies. Based on the Law of
Superposition, this stratum was the oldest culture bearing horizon at the site; it was deposited in a lakeshore context when the lake was stabilized at a higher level than subsequent periods (see Homburg and Ferraro 1997). An AMS radiocarbon assay was conducted on this shell sample and returned a date of 4800 ± 60 B.P. that, adjusted for local reservoir correction, calibrated to 2855 B.C. (middle Holocene).

The shell sample from Unit 20 was found in Level 13 (120–130 cm below surface), within the 2Bwbl soil horizon of the Main Site facies. Stratigraphically, this soil horizon postdates the 3Bwb2 horizon found in Unit 16. The sample returned a conventional radiocarbon date (extended counting time) of 4750 ± 70 B.P. that intercepts the calibration curve at 2825 B.C.

Based on the stratigraphic interpretation of the site, the Stratum 3 (3Bwb2 horizon) should date prior to Stratum 2 (2Bwb1 horizon). Although within Locus C the dates were consistent with this interpretation, the date of 8400 B.P. found in Locus B was inconsistent. Based on the data presented in Chapter 4, these dates are explained by mixing that has occurred on the site. All of the data samples were from small shell fragments that could have easily moved through the sediments. We believe that the date of 8400 B.P. best approximates the date of Stratum 2 of the Main Site facies. The dates returned from Locus C date artifacts that were deposited during the middle Holocene and moved into Stratum 3 through bioturbation. This mixing is corroborated by the mixed results from obsidian hydration and the presence of beads that may have been associated
with the burial distributed over 12 levels in Unit 20. These time markers are discussed in
detail below.

In addition to the radiocarbon assays, 28 pieces of obsidian, including 17 from
Unit 20, were submitted for sourcing and hydration readings. Obsidian flakes were
recovered from Unit 10, Levels 6, 9, 12, 19, and 20; Unit 11, Level 2; Unit 16, Levels 7
and 15; Unit 17, Level 6; Unit 20, Levels 5 (2 samples), 6, 7 (2 samples), 9, 10 (3
samples), 11, 12 (3 samples), 14, 15 (2 samples), and 16; and Feature 4. Unfortunately,
out of these 28 pieces, 22 were either too small to source, from an unknown source, or too
weathered to yield a hydration result. In addition, the sample from Unit 17, Level 6, was a
piece of fused shale from Grimes Canyon and the sample from Unit 11, Level 2, was
from historical-period fill. Finally, although the four remaining samples were all from the
Coso source, they were found in three different units. Even the samples from the same
soil horizon (three of the four remaining samples) returned widely disparate hydration
readings (5.9, 8.2, and 18.8 microns). The sample from the C horizon returned a
hydration rind of 9.3 microns. Clearly the obsidian data from Locus C did not advance
our understanding of site chronology. The data do, however, corroborate our finding that
the site has undergone a fair amount of mixing.

Unit 20 also produced a reasonable sample of time-sensitive shell beads (Grenda
1997:161-166). These beads were probably interred with the burial at Level 13, but
bioturbation and other soil mixing processes moved the beads both up and down through
the deposit. As a result, Early (Phase X and Y) period (King 1990) beads were found
between Levels 5 and 16. Human remains were recovered from Levels 11-15. The beads and the presence of a flaked stone crescent in Level 14 date the burial, which intrudes into sediments older than the occupied surface, firmly in the early Holocene.

**Feature Types**

Three types of features were discovered in Locus C: thermally altered rock clusters (Features 1, 4, and 8), ground stone caches (Features 7 and 9), and a human burial (Feature 10). Because the rock features were still recognizable as clusters or consisted of rocks that were too large to be disturbed by rodent burrows, all of them probably date to the early Holocene occupation of the site. The presence of 13 Early period–style marine shell beads in Unit 20 also indicate that Feature 10 dates to the early Holocene. Each of these features had unique qualities that present different aspects of life and death of members of the groups that used this portion of the site. Indeed, through the use of relatively simple analytical methods each feature can illuminate interesting aspects of prehistoric human behavior at the Elsinore site.

**Feature 1 (Hearth)**

Feature 1, located in Units 11, 12, and 14 in Levels 7, 8, and 9, consisted of a large cluster of thermally altered rocks (see Figures 13). Approximately 200 flaked stone
artifacts and eight ground stone artifacts were found in the feature. A large number of faunal remains (133.9 g) and the presence of small lithic debitage in the feature indicates the it was probably relatively undisturbed. Although flotation analyses indicated the use of grasses, pollen samples revealed a more diverse set of resources including oak, cattail, composites, and ragweed (Grenda and Hogan 1997).

The faunal composition of the feature was extremely informative. Comparing the standardized bone weights in the feature to the standardized values for the Locus C midden (Figure 27a) demonstrates that the animals targeted in this feature were large and small mammals and birds. When the amount of burnt bone in the feature was compared to Locus C (Figure 27b), an interesting pattern emerged. Although more bones were likely to be found in Feature 1 than in the general Locus C deposit, bones in the general midden were more likely to be burnt. With the single exception of bird, where the burnt percentage was equal to the midden, bones found in the general deposit were more likely to be burnt than those found in the feature. This indicates that animals were cooked in the feature, but that the bones were disposed of in the general midden of Locus C. This pattern differs from that seen in Locus B and may be a reflection of behavior described by Binford (1980), O'Connell et al. (1991) and others who have conducted ethnoarchaeological studies in Africa and elsewhere. These researchers claim that people cook meat at hearths, eat near hearths or against windbreaks, and then toss bones to the outside, creating a semicircular “toss” zone.
a. Feature 1 vs. Locus C Midden
(standardized values)

b. Feature 1 vs. Locus C Midden
(standardized values)

Figure 27. A comparison of bone weight and percentage of burnt bone between Locus C midden and Feature 1.
Feature 4, located in Units 14 and 18 in Level 12, consisted of a small cluster of thermally altered rocks (see Figure 14). The feature contained 107 pieces of debitage, four flaked stone tools, and two pieces of ground stone. A relatively low number of faunal remains (32.7 g) coupled with the presence of small lithic debitage indicates that Feature 4 was relatively undisturbed but that it saw much less use than Feature 1. Flotation results indicate the use of grasses and chenopods and the pollen analyses were inconclusive (Grenda and Hogan 1997).

The faunal composition of Feature 4 was similar to Feature 1 in that the targeted species were apparently large and small mammals (Figure 28a). The percentage of burnt bone in this feature was also similar except that a higher percentage of large mammal bones were burnt in comparison to Locus C (Figure 28b). Although more large and small mammal bones were likely to be found in Feature 4 than in the general Locus C deposit, bones in the midden (with the exception of large mammal) were more likely to be burnt. This feature, like Feature 1, was apparently a place where animals were cooked, but not where bones were disposed of.
Figure 28. A comparison of bone weight and percentage of burnt bone between Locus C and Feature 4.
Feature 8 (Hearth)

Feature 8, located in Units 17 and 26 in Levels 12 and 13, consisted of a small cluster of thermally altered rocks (see Figures 16). The feature contained 171 pieces of debitage and two pieces of ground stone. A moderate number of faunal remains (65.9 g) coupled with the presence of small lithic debitage indicates that this feature was relatively undisturbed. Flotation and pollen results show extremely poor preservation and were inconclusive.

The faunal composition of this feature indicates that small mammals were targeted (Figure 29a). The percentage of burnt bone in this feature is unlike the others in Locus C in that a higher percentage of bones were burnt in comparison to Locus C (Figure 29b). Only very small mammals were more likely to be burnt in the general Locus C deposit. This may indicate that the meat cooked in this feature was eaten around its perimeter and the bones were disposed in the hearth.
Figure 29. A comparison of bone weight and percentage of burnt bone between Locus C midden and Feature 8.
Feature 7 (Ground Stone Cache)

Feature 7 consisted of a cache of two metates that were stacked in a nested fashion. No hand stones or mano stones were found in association with these artifacts, corroborating the hypothesis that the smaller ground stone artifacts may have been more heavily curated items (Towner et al. 1997:215-224). Flotation analysis of the sediment within the metates indicates that grasses were processed in these artifacts. A pollen wash from the metate, however, yielded a broader spectrum of species, including pine (which is also a windblown pollen), sage, grasses, and other composites.

Caches of metates and other milling equipment are relatively common in southern California archaeological sites (Basgall and True 1985; Kowta 1969; Salls 1983; Freeman and Van Horn 1990:13). Caches such as these have been interpreted as evidence for semipermanent occupation, and as evidence that the inhabitants intended to return (Freeman and Van Horn 1990). The presence of ground stone caches (Features 7 and 9) fits with our general interpretations that early groups were relatively mobile but may have been tethered to a few relatively resource-rich sites.

Feature 9 (Ground Stone Cache)

Feature 9 consisted of a cache of three stacked metates similar to Feature 7. Also like Feature 7, no hand stones or manos were found in association with these artifacts.
Although no flotation samples were taken, pollen analyses indicate the use of ragweed and perhaps pine nuts, grasses, and other composites. The presence of windblown pollen may suggest that the pollen on ground stone is not related to use. The presence of this second set of cached metates strengthens the argument that this locale was one that was visited repeatedly by groups of people.

Feature 10 (Human Burial)

Feature 10 consisted of an early Holocene adult human burial in Unit 20. Because the unit was extremely muddy, all of the excavated dirt from the unit was wet screened. Human remains were first recognized at the sorting screens in the Level 13 fill. Once the material was identified, excavation in the unit was halted until a Riverside County Coroner's representative was dispatched to the scene. The forensic archaeologist from the county then removed the rest of the remains from the unit and took possession of the identified remains from the screens (Suchey 1993).

After the remains were removed, excavation proceeded in the unit until a court order stopped the archaeological project. Based on nearby trenches and units we believe the deposits in Unit 20 would have reached a depth of about 190 cm. Level 16 (160 cm), however, was the last excavated level. Although the burial appeared to be at Level 13, human remains were present in Levels 11 through 15. We carefully searched for evidence of a burial pit, but none could be discerned. All human remains found subsequent to the
county forensic archaeologist’s visit were picked up on site by a representative from the
coroner’s office.

Although beads from the early Holocene are relatively rare, 13 were present in
Unit 20. Beads were found between Levels 5 and 16. In addition, a flaked stone crescent
was found in Level 14. This crescent was the only one found outside of Locus B.

Distributional Patterns

The excavation sample size from Locus C was relatively large both in terms of
square meters (n = 30.50) and cubic meters excavated (n = 54.13). All units in this locus
were within the Main Site facies and yielded an extremely high density of lithic artifacts
and faunal materials (Table 11). These data allow us to infer with confidence that the
locus was used as the domestic portion of a recurrent extended habitation site.

Density of cultural material reached a peak for the entire site in Unit 20. This area
was probably where most domestic activities took place and may have been where house
structures were located. The presence of hearths and ground stone caches contribute
significantly to the interpretation of Locus C as a place of domestic activities. The spatial
and temporal distribution data present some interesting patterns for the interpretation of
Locus C.
Table 11. Flaked Stone and Faunal Densities for Units in Locus C.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Size (m)</th>
<th>Level Excavated (10 cm)</th>
<th>Flaked Stone Total</th>
<th>Faunal Weight (g)</th>
<th>Density of Lithics/Faunal per 1 m² x 10 cm (0.1 m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/23</td>
<td>2 x 2/.5 x .5</td>
<td>23/21</td>
<td>2,399</td>
<td>397.04</td>
<td>24.67/4.08</td>
</tr>
<tr>
<td>11/12/14/18</td>
<td>2 x 2/1 x 2/1 x 2/.5 x .5</td>
<td>23/13/13/8</td>
<td>3,956</td>
<td>1,365.39</td>
<td>26.03/8.98</td>
</tr>
<tr>
<td>16/25</td>
<td>2 x 2/.5 x .5</td>
<td>18/16</td>
<td>1,872</td>
<td>1,096.53</td>
<td>24.63/14.43</td>
</tr>
<tr>
<td>17/26</td>
<td>2 x 2/1 x 2</td>
<td>18/13</td>
<td>3,954</td>
<td>1,561.15</td>
<td>40.35/15.93</td>
</tr>
<tr>
<td>20</td>
<td>3 x 3</td>
<td>16</td>
<td>6,746</td>
<td>3,212.43</td>
<td>46.85/22.31</td>
</tr>
</tbody>
</table>

Unit 10/23

Unit 10/23 had a number of distinct peaks in debitage density that can be divided into four periods of occupation. The first period of occupation occurred in Levels 2 and 3, the second in Level 5, the third between Levels 7 and 11, and the fourth between Levels 15 and 21 (Figure 30a). Based on the presence of small debitage (Figure 30b) and weathered bone in all of these periods, these peaks apparently represent distinct occupational episodes. In fact these occupation episodes were tested for mean differences, and the results showed no significant difference in the amount of small debitage across all peaks (p = .73). Because there was apparently more flaked stone tools in the deeper levels and more ground stone in the later levels we may be witnessing the subtle transition between the early and middle Holocene groups. Based on changes in the density of faunal remains, it also appears that the earlier occupations were slightly less intense.
Figure 30. A comparison of an artifact and ecofact area graph to debitage size class data (Units 10 and 23).
Units 11, 12, and 14

Patterns present in Units 11, 12, and 14 closely follow the patterns seen in Unit 10/23 about 10 m to the east. The peaks and valleys in the lithic debitage and faunal assemblages were, however, more dramatic. The first visible period of occupation occurred in Levels 3 and 4, the second in Levels 6, 7, and 8, the third between Levels 11 and 13, and the fourth between Levels 19 and 23 (Figure 31a). Based on the presence of small debitage (Figure 31b) in all of these periods we feel these peaks represent the same distinct occupational episodes present in Unit 10/23. In fact, a test of mean differences concluded that there was a significantly higher amount of small debitage in the peak at Levels 19–23, than in the Levels 14–18 ($p = .035$). A similar pattern of more flaked stone tools in the deeper levels and more ground stone in the later levels was present in this excavation unit group. The changes in the density of faunal remains was also more pronounced in this area, suggesting that the earlier period was less intensely occupied.
Figure 31. A comparison of an artifact and ecofact area graph to debitage size class data (Units 11, 12, 14, and Feature 1 and 4).
Unit 16/25

Unit 16/25 had three peaks in artifact density (Figure 32a), all with high proportions of small debitage (Figure 32b). The first peak occurred in Level 6, the second in Levels 8 and 9, and the third in Level 13. The first peak, in Level 6, may be artificial because the top five levels were fill and may have actually contained more artifacts prior to disturbance. This peak was caused by an increase in the amount of faunal remains. The relatively low density of lithics in this level may indicate that this area was a trash or hearth clean-out area. The peaks at Levels 6, 8, and 9 emphasize the strong correlation ($r = .50$) between lithic and faunal remains, as well as with flaked and ground stone tools. The peak also showed a significantly larger amount of small debitage when tested against Levels 1–4 ($p = .048$). The peak at Level 13 may be slightly misleading because of the presence of Feature 7. This feature created the ground stone peak that emphasized lithic material. Without these ground stone artifacts, the peak was less pronounced. Nevertheless, this ground stone cache was probably left on the occupational surface. The presence of weathered bone strengthens this hypothesis.
a. Artifacts and Ecofacts by Level, Units 16, 25, & Feature 7

b. Debitage Size-Class Data, Units 16, 25, & Feature 7

Figure 32. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 16, 25 and Feature 7).
Units 17 and 26

Units 17 and 26 had three peaks in artifact density (Figure 33a) that all have high proportions of small debitage (Figure 33b). The first peak occurred between Levels 2 and 6, the second in Levels 11 and 12, and the third in Level 17. The first peak in lithic debitage actually consisted of three smaller peaks that were associated with a relatively stable amount of faunal remains and small debitage ($r = .71$). The second peak occurred in the levels where Feature 8 was located. The presence of lithic and ground stone tools, and an increase in faunal remains and overall lithic debitage indicates an occupational event. In fact, the peak at Levels 11 and 12 showed significantly more artifact and ecofact remains than in the valleys at Levels 10 and 13 ($p = .004$). The peak at Level 17 may be related to a change toward a harder culturally sterile substratum.
a. Artifacts and Ecofacts by Level, Units 17, 26, & Feature 8

b. Debitage Size-Class Data, Units 17, 26, & Feature 8

Figure 33. A comparison of an artifact and ecofact area graph to debitage size class data (Units 17, 26 and Feature 8).
Unit 20

Because excavation was suspended prior to the completion of Unit 20, distributional patterns were visible for only 160 cm of deposit that may have reached a depth of about 190 cm. Nevertheless, there were four clear peaks in the lithic and faunal densities (Figure 34a). The presence of a relatively consistent level of lithic and ground stone tools, the presence of a human burial, and the fact that the unit produced the highest overall density of lithics and faunal remains on the site suggest that this area was near the center of the habitation during the early and middle Holocene.

Because of the large number of artifacts and ecofacts present in this unit, only certain levels were intensively analyzed. A consistently high density of small debitage (Figure 34b) indicates that the unit was only minimally affected by water-related events. The four peaks—at Levels 4, 7, 10–12, and 14—were all relatively similar in that they contained lithic and ground stone tools and peaks in both faunal and lithic material. There was a significant correlation between the lithic and faunal remains of $r = .89$. We interpret these peaks as four major occupation episodes. The overall intensity of occupation appears to decrease through time, perhaps indicating that the lake was decreasing in size and the settlement was shifting toward the lake.
Figure 34. A comparison of an artifact and ecofact area graph to debitage size class data (Unit 20).
Locus Function and Interpretation

Although two radiocarbon assays place Locus C in the middle Holocene, the presence of early Holocene bead styles and a flaked stone crescent indicate that the area was inhabited during an earlier period. We believe that the dated material was translocated into the early Holocene soil horizons through bioturbation. Most of the deeper materials and all of the features probably date to the early Holocene. The presence of two middle Holocene dates and increases in ground stone in the upper levels of Locus C indicate that a middle Holocene occupation is present at the site. It is our belief that this locus has data representative of the early-middle Holocene Transitional period.

In Units 10/23, 11, 12, and 14, the most intense occupation episodes were apparently in the higher levels, whereas in the units farther to the north (16/25, 17/26, and 20), the intense occupations were in the deeper levels. This occupational shift was probably directly related to changes in the level of the lake between the early and middle Holocene, and led to the maintenance of a lakeshore settlement.

Based on the extremely high density of flaked stone tools, a large number of features, and the stable nature of the sediments, it is reasonable to conclude that the area served as a habitation site for extended periods. Although use of the site was apparently relatively constant, the presence of clear occupation episodes indicates periods of increased and decreased activity. A comparison of the bottom and top levels indicates the intensity of occupation increased over time. The high percentage of burnt bone present in
the general deposit suggests that Locus C was the domestic area of the habitation site. This locus represents a recurrent extended encampment during the middle Holocene that may have been inhabited for most of the year. A shift from the presence of primarily domestic activities in Locus C during the early Holocene to mixed processing and domestic activities during the middle Holocene suggests that something more than a simple reaction to the changes in the lake occurred during the Transitional period. The ramifications of this shift are explored in my discussions of social organizational change (Chapter 6).

Inter-Locus Summary and Comparisons

Comparing patterns present in the three loci provides an interesting view of the different activities carried out at the site over its 8,500-year history. Based on the data presented in Homburg and Ferraro (1997), Strand (1997a, 1997b), Towner et al. (1997), and the discussions above, Locus C was the most intensively occupied area of the site. This is shown graphically in a comparison of bone weight present in each locus (Figure 35). A similar pattern was visible in the lithic assemblage as the highest diversity of lithic tool types was present in Locus C. Locus B is interpreted as the early Holocene faunal processing area for Locus C. This interpretation is consistent with the high density of bone in Locus C and the low density of bone in Locus B. The lithic assemblage in Locus B had a higher proportion of flaked stone tools that were used in animal
Figure 35. A comparison of bone weight and percentage of burnt bone between Loci A, B, and C.
processing, whereas Locus C had a higher proportion of ground stone artifacts. Figure 35a also shows that Locus A appears to represent a late Holocene procurement and processing location for large mammals and waterfowl.

Attacking the problem of subsistence differences between the loci requires a comparison of the amount of burnt bone across the site (Figure 35b). Burnt bone from Locus A probably indicates reliance on rabbits by small task groups while at a processing site. Because of the direct relationship between Loci B and C, apparent subsistence differences actually reflect processing activities and disposal patterns respectively. Figure 35b suggests an emphasis on larger mammals in Locus C. This size category is, however, probably overrepresented because of the processing techniques used on different sized animals. A large amount of the unidentifiable bone in Locus C is probably from small mammals that were processed by grinding or pounding into mush. Faunal analyses indicate hunting through time was focused on rabbits (Strand 1997a).

A graphic presentation of the taphonomic processes at work on the site (Figure 36) indicates that the lake was a major factor in determining bone staining. Locus A had the most stained bone and Locus C the least. The same pattern is true for unburnt bone. Unburnt bone is relatively rare in Locus C, where the majority of the domestic trash was deposited. Loci A and B show greater levels of unburnt bone because they were more closely related to initial processing of the animals and not cooking. These hypotheses are supported by the extremely high percentage of burnt and calcined bone present in Locus C. The burnt and calcined bone in Loci A and B probably reflects animals eaten in the
Figure 36. A comparison of bone taphonomy across Loci A, B, and C.
processing area. The lower percentage in Locus A probably reflects its use as a short-term processing camp.

TRANS-HOLOCENE STABILITY AND CHANGE AT LAKE ELSINORE

Throughout its history, the Elsinore site has served as an important locus of activity for a variety of settlement systems. Each of these reflects a different position in the system and a different type of social organization. Although the dynamics of site structure can be explained by changes in the local environment and social organization, the broader issues of the forces behind social change and the overall shifts in the settlement system can be addressed only at the intersite level of analysis, which is the subject of Chapter 6.

Our analyses of the data from the Elsinore site have provided a unique view of the changing role one site played throughout the Holocene. What is perhaps most surprising is that during this time of major climatic change, settlement and social organizational dynamics provided the primary adaptive mechanism, whereas conventional interpretations focus on changes in subsistence strategies. The commonly held belief (Wallace 1978) is that prehistoric cultures underwent “slow but fundamental changes” in their subsistence strategies. “An initial hunting-based mode of existence was replaced by one emphasizing seed collecting, and this in turn gave way to a variety of subsistence specializations, reflecting improved adjustment to local environments” (Wallace
These economic changes were "accompanied" by modifications in technology, settlement, and lifestyles. This was clearly not the case at the Elsinore site where the subsistence strategy remained constant. This section looks at the changes that took place over the history of the site and provides the basis for a re-evaluation of southern California prehistoric social organization (Chapter 6).

**Initial Occupation: Early Holocene**

Initial occupation of the Elsinore site occurred on the beach of a small embayment nearly 8,500 years ago (Figure 37). During the early Holocene, Lake Elsinore was a stable resource because a higher level of rainfall kept the lake over the level required to create an outflow (Homburg and Ferraro 1997). The settlement was divided into a faunal processing area near the lakeshore and a domestic area where grinding activities (floral processing), cooking, and eating took place. The domestic area was set back from the lakeshore where the soil was dry and house structures would not be affected by changes in the lake level during storms.

Although rabbits and seeds were probably the staples that provided most of the calories, subsistence during the early Holocene was apparently based on a variety of floral and faunal resources. Floral resources included a variety of grasses, ragweed, sage, pine, sedge, and cattail. Faunal resources primarily consisted of small game but also included rodents, a few large terrestrial mammals, waterfowl, and some reptiles. During their
Figure 37. Early Holocene settlement structure at the Elsinore site.
annual round, the highly mobile population probably visited the site at a specific time of
the year to take advantage of the lake's abundant resources. Because the early lithic
assemblage more closely resembled coastal San Dieguito assemblages than those from
the Great Basin we assume that these groups exploited coastal resources at other times of
the year. Shell beads found at the site corroborate this hypothesis and indicate that
mobility also served to reinforce social and ideological ties to the coast.

The technology in use during the early Holocene was relatively unspecialized.
Crescents were probably highly portable tools that served many purposes. A dearth of
projectiles probably reflects the emphasis on small game better procured with nets,
snares, and other tools. The ground stone assemblage was also relatively unspecialized,
consisting primarily of multipurpose metates. These nonportable artifacts were left at the
site when the group moved to the next stop in its annual round.

Village Life: Middle Holocene

Occupation of the Elsinore site during the middle Holocene occurred in the same
general area as the early Holocene, but the organization of the settlement was
fundamentally different (Figure 38). A lower level of rainfall (Altschul et al. 1996; Feng
and Epstein 1994; Kahn et al. 1981; Pisias 1978) during the middle Holocene led to lower
lake levels and the formation of a small lagoonalike environment (see Chapter 4). During
this time of climatic warming, the Pluvial lakes of the interior deserts were probably not
Figure 38. Middle Holocene settlement structure at the Elsinore site.
filling as often and locations like Lake Elsinore were becoming increasingly scarce. As populations were forced to exploit fewer plentiful areas, competition for resources may have led to longer stays at the location. During the middle Holocene, the more permanent settlement was much larger and thus spread around the margin of the lagoon. This increase in settlement size probably reflects a concentration of groups in good site locations. Evidence of increased use of the lake is shown in the number of sites recorded in the area. As many as four middle Holocene sites (RIV-4042, -4044, -4045, -4110) were present around the lake (Del Chario 1991; Hampson 1991, 1992; Sturm 1992). At that time, the Elsinore site was no longer divided into a faunal processing area and a domestic area. The site now displayed a mixture of processing and domestic activities across the entire site. These areas were located on remnant terraces that were relatively unaffected by floods.

Rabbits and seeds remained the staple foods. As populations became more concentrated, however, a broadening of the resource base as evidenced by the addition of mortars and pestles (acorn use) and a general increase in ground stone, apparently relieved the stress on resources. Longer stays at the site probably also led to the exploitation of resources that were not present during the shorter early Holocene visits to the site.

A lack of Middle period beads may indicate that visits to the coast became more economically oriented rather than serving to reinforce social ties or to facilitate information exchange. This is surprising in light of recent findings by Raab and others
(Howard and Raab 1993) that there were socioeconomic links (i.e., interaction sphere) between the inhabitants of the southern Channel Islands, the adjacent coast, and perhaps the Great Basin. These linkages were based on the presence of *Olivella* grooved rectangle (OGR) beads in archaeological sites dating to the middle Holocene. Although negative evidence is difficult to assess, a lack of OGR or any other middle Holocene beads at the Elsinore site may suggest that this area was outside of the interaction sphere.

Technology in the middle Holocene was more specialized than in the early Holocene. As groups became less mobile, the need for highly portable, multipurpose tools diminished and specialized tools were developed. We see an increase in flaked stone tool types and the ground stone assemblage becomes more diverse. A lack of cached ground stone artifacts may indicate that these groups never fully abandoned the site at any point during the year.

**Resource Procurement: Late Holocene**

Late Holocene occupation of the site indicates that an entirely different settlement pattern was established. By this time, lower annual rainfall totals and frequent droughts led to a lake that had achieved its modern pattern of droughts punctuated by large floods. This pattern led to the formation of a barrier beach between the lake and the small freshwater marsh that was fed by the hot springs. This barrier was occasionally breached during large winter floods and the site area became inundated. Rather than being used as a
permanent settlement, the site during the late Holocene shifted to a more sporadically used resource procurement location (Figure 39).

As suggested by True and Waugh (1982), many factors are behind this shift in site use and probably include a decreasing regional water supply and a perceived need to assume a defensive posture around key resources that became increasingly proprietary. The fluctuating presence of Lake Cahuilla may also have drawn people away from the site. Site specific factors probably included a less stable local environment that no longer served the general needs of the community. Although at times the site was probably highly productive, at other times the site may have had few exploitable resources.

Although the subsistence strategy presented by the late Holocene occupation of the site did not represent a long-term habitation, rabbits and seeds appear to have remained the staple goods. Small task groups probably came to the site to gather specific resources such as waterfowl or tules. During such trips, subsistence practices apparently focused on rabbits and seeds. Although subsistence in the villages may have been substantially different, relying on stored foods at many times of the year, the mobile task groups apparently maintained a subsistence practice similar to the earlier hunter-gatherers.

As the regional population became larger, a broadening of the resource base appears to have continued. Specific resource procurement locations were established and probably served to relieve stresses on the resources around major habitation sites. A relatively minimal amount of Late period beads and obsidian may indicate that visits to
Figure 39. Late Holocene settlement structure at the Elsinore site.
the coast and deserts were relatively rare and that the Elsinore area was only minimally connected with the shell bead trade of the nearby Gabrielino culture. This may have been a continuation of a pattern established during the middle Holocene. Because the site does not appear to be a habitation site, however, connections with the coast during the late Holocene are difficult to assess.

The technology of the late Holocene is also difficult to assess at a resource procurement location because only certain activities were conducted there. Late-style projectile points may indicate that the area was used to procure larger game. This interpretation is consistent with the emphasis on medium- and small-sized animals in Locus A (see Figure 35). Cached ground stone found in Locus A may indicate that the Elsinore site was not highly protected from outside use. That the general location has a place-name in Juaneño dialect, and that the lake is mentioned in the creation myth of the Luiseño culture, corroborates this hypothesis. Alternatively, cached artifacts may mean that the groups did not move far from the site. Sites that possess place-names, such as Elsinore, may have been so closely affiliated with the Luiseño that no other groups tried to compete.

The nature of the archaeological record at Elsinore indicates the site witnessed certain peak periods of occupation. These peaks have been gauged by the relative quantities of lithic debitage, tools, and faunal remains found in different levels and loci across the site. Most of the material appears to be associated with an early to middle
Holocene period of occupation. The density of materials points to a series of relatively long-term intense habitations.

Without a clear understanding of the site formation processes I would have likely interpreted Locus B as a classic early Holocene (San Dieguito) settlement, Locus C as a middle Holocene (Pauma) village, and Locus A as a late Holocene (San Luis Rey I) camp site. Although this interpretation would have fit the accepted cultural chronology of the region, it would have failed to advance our understanding of the changes in social organization of the early inhabitants of southern California. I hope the analyses presented in this document have helped in that regard.
CHAPTER 6

LIFE DURING THE TRANSITION: SITE STRUCTURE, SETTLEMENT SYSTEMS, AND SOCIAL ORGANIZATION

Conventional interpretations (e.g., Wallace 1978) of the southern California cultural sequence suggest that early hunter-gatherers migrated into the Great Basin and down the coast from the north sometime around 11,000 years ago. Whereas the desert groups were big-game hunters, the coastal groups focused more on the available maritime resources. Floral resources were exploited by both groups but to a lesser degree than the primary resources. Sometime around the early to middle Holocene transition, the Milling Stone cultures become established along the coast (inland Milling Stone sites appear somewhat later in time). At this time the subsistence balance shifted from animal to plant foods, focusing on hard seeds. Finally, more-specialized exploitations of particular environments evolved and artifact assemblages began to take on local variations. This interpretation asserts that slow but fundamental shifts in subsistence led to modifications in settlement patterns, technology, and lifestyles. Data from the Elsinore site appear to challenge this view of prehistory and provide important insights into the hunter-gatherer lifeway.

In my review of current issues in prehistory (Chapter 2), I presented my ideas about why archaeologists misunderstand California hunter-gatherers. I focused on (1) how the documented collection of early sites poorly represents hunter-gatherer variability, (2) how inappropriate methods and the lack of synthetic documents in cultural resource management perpetuates our problems, (3) how a reliance on broad paleoenvironmental data overshadows
local conditions and masks site variability, (4) how the lack of an appropriate middle-range theory leads to poor interpretations of sites, and (5) how an uncritical use of scant ethnographic sources and questionable ethnohistoric records has led archaeologists to project historic lifeways blindly into the past. These factors have worked in concert to distort our understanding of hunter-gatherers.

TOWARD AN UNDERSTANDING OF HUNTER-GATHERER LIFEWAYS

In an effort to address the issues outlined in Chapter 2, I explored Thomas's (1985) modes of inquiry into hunter-gatherer lacustrine lifeways. These modes were (1) modeling lacustrine resource structures and strategies using the ethnographic record, (2) employing regional archaeological survey data, and (3) encountering the high-information site. Subsequent analyses (Grenda and Hogan 1997; Strand 1997a, 1997b; Towner et al. 1997) demonstrated that the Elsinore site fits his description of a high-information site. The site retained major exposures of sediments from the entire Holocene to clarify issues of cultural and paleoenvironmental chronology (Homburg and Ferraro 1997) and had sufficient micro- and macrofossils to reconstruct the fine-grained details of subsistence and settlement structures (Grenda and Hogan 1997). Although similar sites exist, most other high-information sites were excavated early in the history of archaeology and failed to yield interdisciplinary data. This chapter synthesizes available information from other sites and review the ethnohistoric data in an effort to further our understanding of regional prehistory.
According to Thomas (1985:27–28), the methodological "trick" is to link the high-information site to regional survey data so that issues of human ecology and adaptation can be addressed. The challenge here is to look at the relationship between site structure and the settlement system to address issues of social organizational change. To accomplish this task the regional archaeological excavation data are used to place the Elsinore site in its proper context. In the past, researchers have associated organizational change with shifts in subsistence practices that were brought on by environmental change. Although I recognize the role of a changing environment, I argue that a flexible social system was the primary adaptive mechanism that served to relieve stress on human populations, and that subsistence practices remained relatively stable throughout the Holocene.

How the Elsinore Site Advances Our Understanding of Site Structure, Settlement-Subsistence Systems, and Social Organization

Chapter 5 summarized roughly 8,500 years of occupation at the Elsinore site. Sediments at the site contain data relating to some of the most critical events in the southern California region: the introduction of acorn use, the transition to sedentism, and broad environmental change. But in the midst of these dynamics, there were elements of continuity. As evidenced by data from each of the loci, some of these elements characterized all of the occupations.

Perhaps the most basic element of stability was the focus on small game, particularly rabbits. From the earliest use of the site onward, small game played a major role in prehistoric
subsistence. Well over 70 percent of the entire faunal collection was classified as small mammal, and nearly 80 percent of the identified mammals were small (Strand 1997a). This pattern characterized the entire Holocene at Elsinore and apparently held true at most inland southern California sites. Even on the coast, where the focus was on marine resources, rabbits were the most exploited terrestrial mammal through time (Mason 1996).

Beyond rabbits, most other subsistence practices also remained relatively stable over 8,500 years. Large and very small mammals were consistently used at a relatively low level throughout prehistory. Lacustrine exploitation, which was apparently secondary to terrestrial use, remained focused on waterfowl and turtle with much less emphasis on fish and reptiles. With the exception of adding acorns to the diet, little change occurred in the diversity and proportions of floral species used at the site. The only visible changes in subsistence strategies were directly related to the changes in site function during the late Holocene. In contrast to these stable subsistence strategies, social organization was relatively dynamic over the course of the Holocene.

As discussed in Chapter 5, early Holocene settlement structure was organized around specific tasks. The faunal processing area near the lake was separate from the domestic activities (i.e., cooking, eating, and sleeping) that were carried out some distance from the lake. In contrast, the middle Holocene deposit displayed a settlement structure in which a mixture of processing and domestic activities took place throughout the site. I believe this shift in settlement structure is more than just an economic adjustment. I suggest that these patterns relate to a realignment in the way society was organized.
To understand the complex interrelationships between site structure, settlement-subsistence systems, and social organization it is necessary to examine each of these topics in detail. At the Elsinore site, an understanding of site structure required (1) making assumptions about hunter-gatherers' use of space based on ethnoarchaeology, ethnography, and archaeology (Chapter 2); (2) explaining the formation processes at work on the site (Chapter 4; see Homburg and Ferraro 1997); and (3) comprehending the distributional patterning of artifacts, ecofacts, and features across both time and space (Chapter 5). An understanding of the settlement-subsistence system requires a knowledge of contemporaneous sites and an understanding of how these sites fit into the regional pattern. Finally, making the leap from site structure and settlement-subsistence system data to social organization requires the construction of hypotheses about the organization of groups in southern California and the implications these organizations have for the archaeological record.

Some researchers posit an organizational shift from small hunting bands composed of related people to larger bands composed of a number of unrelated groups during the late Holocene. These different organizational structures are similar to the patrilineal and composite hunting bands described by Steward (1955). Steward used these terms as heuristic devices to cope with the ethnographic present and attached an evolutionary scheme to help explain the observed cultural differences. Over the years, however, these terms have been reified and misused, so any type of cultural evolution is now criticized. For these reasons, these terms are avoided and I argue that different patterns in the archaeological record suggest a change or shift in social organization.
Small communally organized bands are defined by extreme fluidity and movement of the population providing an efficient mechanism for adjusting to seasonal and yearly changes (Ames 1991; Lee 1972; Yellen 1977, 1990). In this type of organization, task-oriented groups provide for the needs of the entire band and the site boundary is essentially the same as the group boundary. Within the site, it is expected that these groups leave a record that displays spatially discrete task-oriented behaviors. Ethnographically, task groups were often split along gender lines but these distinctions may not be visible in the archaeological record.

Because small bands of approximately 25 related people are not large enough to be a viable population (Birdsell 1953, 1957), these groups must interact with other groups at various times of the year. Steward (1955) agrees with Birdsell and suggests that small groups are often distributed in much larger social systems. In areas like southern California, small groups probably came together at resource-rich areas for social exchange and then broke back into smaller bands after the local resources were exhausted or the social exchanges were complete. This pattern of forming relatively short-lived larger groups for social needs may have eased the organizational transition to living in larger groups when broad environmental changes reduced the number of resource-rich areas.

Various forms of larger multifamily bands are possible. In these types of social organizations, the larger communal economy is less important to the smaller related groups and thus tasks are carried out by individual economic units (e.g., families). Sites generated by bands organized in this fashion should appear in the archaeological record as a series of
discrete locations across the site where a mixture of activities took place. Each discrete location should represent the boundary of an individual economic unit.

Based on the Elsinore data, it is argued that a social organizational shift between these types of groups took place much earlier in prehistory than conventional interpretations posit. I suggest the shift took place in response to the broad environmental changes at the early-middle Holocene transition. Similar to Koerper et al.'s (1991) argument about the coast, little direct economic effect of the Altithermal at Lake Elsinore is visible. In fact, there is no evidence that local residents were ever forced to rely on lake resources because of a failure in terrestrial resources. Regionally, however, there may have been major population shifts to areas that were relatively resource rich. This indirect effect led to aggregated populations in these areas and the need to have a social structure to cope with larger groups.

Koerper et al. (1991) view cultural evolution from San Dieguito to La Jolla as caused by technoeconomic change (i.e., milling stones allowing for seeds to be exploited). I, however, fail to see technological change as the driving force to cultural evolution. Rather I see social organizational change occurring in response to population aggregation and other demographic shifts that took place on a regional scale. The Elsinore data suggest that a relatively sophisticated ground stone technology was already in place during the early Holocene. Technological innovation may have followed in response to the need to exploit a broader resource base more efficiently within a more limited territory. This argument generally agrees with Glassow's (1991) interpretation of the cultural developments in the Santa Barbara region. He sees a shift in settlement-subsistence systems from a wide-ranging forager type of system
prior to 8500 B.P. to a less mobile collector type of system after this date. Although he cautions that his data are severely limited, he argues that the shift is a response to an increase in population density along the coast. Regardless of which model is more accurate, I expect that groups organized in small bands composed of related people create a pattern in the archaeological record that differs substantially from patterns left by bands composed of multiple unrelated groups.

The next section explores how the inferred site structure at the Elsinore site compares to other early Holocene sites. Although comparative data are difficult to find, most site reports provide a list of diagnostic artifacts found and brief interpretations of site function. Combined with interpretations of the Elsinore site, these data provide the basis for testing ethnographic models and for reconstructing prehistoric settlement-subsistence systems.

**Early Holocene Site Structure**

The analysis of site structure for the identification of activity areas in Chapter 5 assumed that such activities were differentially distributed within the site and that there was a quantitative relationship between the specific behavior that occurred and the material record that was generated. As O'Connell et al. (1991:73) point out, differential distribution does not require that activities be completely segregated, only that they occur in certain areas more often than others. At the Elsinore site, differential distribution was found in the artifact and ecofact assemblages. Although complete segregation was not found, analyses of artifact and
Ecofact distributions demonstrate clear patterns. Do these patterns match those found at other early Holocene sites?

Artifact and ecofact assemblages similar to those recovered from the Elsinore site are relatively rare in the region. In addition, many of these are poorly documented or were excavated and reported in such a way that, without a complete reanalysis of the provenience data, the sites are poor candidates for intersite comparisons. Some contain comparable lithic studies (see Towner et al. 1997:244-248) and others have comparable faunal studies (see Strand 1997:147-150) but few present artifact provenience information useful for intrasite spatial pattern reconstructions. I examined eight similar early Holocene sites for this section. Four of these sites are located in coastal San Diego County, (SDI-10965) Windsong Shores (Gallegos 1991), (SDI-4392) Rancho Park North (Kaldenberg 1976), (SDI-149) the Harris site (Warren 1966), and (SDI-9649) the Allen O. Kelly site (Koerper et al. 1991). One site (ORA-64) is located in coastal Orange County (Drover et al. 1983). Two of the sites are located in northern California, Borax Lake (Harrington 1948) and (SCR-177) the Scotts Valley site (Cartier 1993). The remaining site (SBR-5250) is in the Mojave Desert (Hall 1993). Unfortunately, only the Windsong Shores report presented comparable intrasite spatial patterning data. The rest of the reports provided general site structure data more suitable for reconstructing regional settlement patterns.
Windsong Shores (SDI-10965)

The Windsong Shores site dates to the early Holocene and is located adjacent to Agua Hedionda Lagoon in coastal San Diego County. Based on the diverse artifact assemblage, Gallegos (1991; Gallegos and Carrico 1984) argues that the site demonstrates cultural continuity between the San Dieguito and Encinitas (Milling Stone) cultures. Gallegos claims the site is similar to the nearby Allan O. Kelly site and that both are campsites where groups focused on the exploitation of shellfish, small fish, small to large mammals, and plant seeds. In addition to presenting descriptive data, Gallegos also provides some interesting interpretations of intrasite patterning.

Patterning of cultural material within the site is reflected by grinding/pounding tools and shellfish remains found along the lagoon edge of the site, milling stones found along the creek edge of the site, and bifaces (including crescents) in the northern portion. Based on his presentation of site stratigraphy and artifact proveniences, I divided the site into northern and southern sections. Similar to the early Holocene component at the Elsinore site, these sections appeared to be spatially discrete activity areas. In addition to containing all of the projectile points and crescents, the north area contained the majority of the bifaces, scrapers, utilized flakes, and debitage. In contrast, the southern portion contained most of the ground stone and bone tools. These spatially discrete areas compared well with Loci B and C at the Elsinore site (Table 12).
Although the other sites I examined failed to present specific data concerning intrasite patterns, four reports (Drover et al. 1983; Gallegos 1991; Hall 1993; Kaldenberg 1976) claim the early Holocene components were relatively short term campsites. This appears to fit the general consensus that the early hunter-gatherers were highly mobile groups. In contrast, Koerper et al. (1991) argue that the Allan O. Kelly site data indicated that a relatively sedentary group used the coast during the early Holocene.

Table 12. A Comparison of Artifacts by Area at Elsinore and Windsong Shores.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Windsong North Area</th>
<th>Windsong South Area</th>
<th>Elsinore Locus B</th>
<th>Elsinore Locus C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project point</td>
<td>2</td>
<td>–</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Crescent</td>
<td>6</td>
<td>–</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Biface</td>
<td>6</td>
<td>2</td>
<td>49</td>
<td>29</td>
</tr>
<tr>
<td>Uniface</td>
<td>–</td>
<td>–</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>Drill</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Scraper</td>
<td>38</td>
<td>22</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Chopper</td>
<td>1</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Utilized flake</td>
<td>9</td>
<td>2</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>Core</td>
<td>3</td>
<td>3</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Cobble tool</td>
<td>2</td>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Flakes/angular waste</td>
<td>4703</td>
<td>3029</td>
<td>9171</td>
<td>14206</td>
</tr>
<tr>
<td>Mano</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Metate</td>
<td>–</td>
<td>1</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Grinding/Pounding tool</td>
<td>–</td>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hammer Stone</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Round/elongate Stone</td>
<td>5</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bone Tool</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Mammal Bone (grams)</td>
<td>695</td>
<td>514.5</td>
<td>2,177.51</td>
<td>6,949.84</td>
</tr>
</tbody>
</table>
Although data on early Holocene intrasite spatial patterning are generally absent in the southern California archaeological literature, data from the Elsinore site and Windsong Shores demonstrated that discrete activity areas existed at habitation sites. I argue that these activity areas demonstrated that a division of labor based on task was present during the early Holocene. The faunal processing area was clearly separate from the floral processing area at both sites. These tasks may have been split along age or gender lines or both. The Elsinore data suggest that the floral processing area was also the living area of the site but the Windsong Shores data are ambiguous on this topic. The Elsinore and Windsong Shores data appear to support the argument that a small group organized at the band level of social organization was present during the early Holocene. Finally, although Windsong Shores contained intrasite spatial patterning data, without a clear middle Holocene component, it could not shed light on the shift in patterning seen at the Elsinore site. Whether similar patterning can be identified at other types of sites remains to seen.

Early Holocene Settlement-Subsistence Systems

Because resources are unevenly distributed across the landscape and become available at different times of the year in varying quantities, most studies of settlement patterns in the Great Basin and southern California (e.g., Bettinger 1975, 1979, 1980; Thomas 1971, 1972, 1973) follow Steward's (1938, 1955) cultural ecological approach. These studies conclude that unpredictable environmental conditions, combined with simple technologies, led to very
flexible subsistence strategies and governed the selection of settlement locations. The critical limiting factor for most human populations was the presence of a significant water source. Based on the locations of the known early Holocene sites, this appears to be true. Almost without exception, early sites were located on a river, lake, island, or estuary.

Although Lake Elsinore was not located on the coast or in the Great Basin, most similar sites are, and data from these sites are used to discuss the early Holocene settlement system. In his discussion of the California coast during the early Holocene, Erlandson (1994:258–259) argues that most large early sites are located on elevated landforms but that many satellite camps were probably buried in canyon fills or destroyed by erosion. He claims that the general lack of small sites “exaggerates the apparent sedentism” of early groups. He argues that early Holocene groups were small and highly mobile, moving between a semipermanent residential base and many seasonal campsites. Although it is true that archaeologists need to pay close attention to identifying small early sites, I find his argument strained on the issue of mobility. It is difficult to understand how a group can be both highly mobile and semisedentary, especially when neither term is defined. In addition, building an argument for mobility based on the premise that we have failed to find small sites is questionable.

I argue that many small early Holocene sites have been found but not identified as such because of poor site preservation, inappropriate methods of investigation, and a lack of attention paid to local paleoenvironmental conditions. As a result, only a handful of intermediate valley sites have been dated to the middle Holocene, and still fewer date to the
early Holocene. Few of those sites that date to the middle Holocene can be referred to as relatively sedentary habitation sites (see discussions below). It may well be that the early Holocene population was extremely small and concentrated along the coast, where local hydrological conditions supported patches of concentrated resources.

Although it is probably true that early coastal groups subsisted primarily on shellfish and plant foods (Erlandson 1994:259–262), interior groups were more terrestrially focused. Even with the presence of Lake Elsinore, groups only marginally used fish, reptiles, and waterfowl. The Elsinore faunal data point to the use of small game for the majority of the animal meat, whereas the abundance of ground stone points to an early reliance on plant foods.

Although there are several sites in San Diego County, most are relatively small. Few clear habitation sites have been identified and the artifact assemblages are relatively poor in both quantity and diversity (Table 13). Populations, therefore may have been extremely small. Furthermore, after the initial entry into the region mobility could have been relatively low during the remainder of the early Holocene (see also Grenda and Altschul 1995). These groups had their choice of habitation locations and probably moved their residential base camp seasonally, when other places became more productive (e.g., the coast during the winter) or for social needs. Other than maintaining kinship ties and exchanging mates, finding a cause for high mobility in an area of low population density and reasonably even resource distribution is difficult. Using the !Kung as their example, Harpending and Davis (1977:283) suggest that a minimum range size exists either when resources are evenly distributed or when
Table 13. Comparison of Early Holocene Artifact Assemblages.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>L. Elsinore Loci B &amp; C</th>
<th>Windsong Shores</th>
<th>C.W. Harris Site</th>
<th>Allen O. Kelly Site</th>
<th>Rancho Park North</th>
<th>Borax Lake</th>
<th>Tiefort Basin</th>
<th>Scotts Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projectile Point</td>
<td>9</td>
<td>2</td>
<td>--</td>
<td>61</td>
<td>--</td>
<td>1</td>
<td>275</td>
<td>21</td>
</tr>
<tr>
<td>Biface point/knife</td>
<td>81</td>
<td>7</td>
<td>36</td>
<td>1</td>
<td>11</td>
<td>15</td>
<td>P</td>
<td>85</td>
</tr>
<tr>
<td>Crescentric/eccentric</td>
<td>18</td>
<td>4</td>
<td>1</td>
<td>102</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>--</td>
</tr>
<tr>
<td>Scraper/scaper plane</td>
<td>--</td>
<td>43</td>
<td>49</td>
<td>2</td>
<td>118</td>
<td>245</td>
<td>32</td>
<td>--</td>
</tr>
<tr>
<td>chopper/combination</td>
<td>--</td>
<td>2</td>
<td>1</td>
<td>--</td>
<td>41</td>
<td>21</td>
<td>28</td>
<td>--</td>
</tr>
<tr>
<td>Cleaver</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
<td>Drill</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>9</td>
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</tr>
<tr>
<td>Graver</td>
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<td>--</td>
<td>--</td>
<td>14</td>
<td>44</td>
<td>--</td>
<td>266&quot;</td>
</tr>
<tr>
<td>Flake Tool</td>
<td>47</td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>679</td>
<td>234</td>
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<tr>
<td>Combination Tool</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>56^b</td>
<td>--</td>
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<tr>
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<td>26</td>
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<td>--</td>
<td>136</td>
<td>15</td>
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<tr>
<td>Flakes/angular waste</td>
<td>23691</td>
<td>7732</td>
<td>--</td>
<td>--</td>
<td>2941</td>
<td>4337</td>
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<td>Stone Ball</td>
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<td>--</td>
<td>35</td>
<td>3</td>
<td>16</td>
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<tr>
<td>Mano/hand stone</td>
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<td>5</td>
<td>--</td>
<td>--</td>
<td>93</td>
<td>10</td>
<td>23</td>
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</tr>
<tr>
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<td>--</td>
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<td>--</td>
<td>--</td>
<td>15^b</td>
<td>--</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Grinder/pounder</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>--</td>
<td>40</td>
<td>--</td>
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<tr>
<td>Unidentified ground stone</td>
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<td>--</td>
<td>18</td>
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<tr>
<td>Stone ornament</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1^b</td>
<td>1</td>
<td>P</td>
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</table>

Table continues...
Table 13. Comparison of Early Holocene Artifact Assemblages (continued).

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>L. Elsinore Loci B &amp; C</th>
<th>Windsong Shores</th>
<th>C.W. Harris Site E-str</th>
<th>C.W. Harris Site IIIA-C</th>
<th>Allen O. Kelly Site</th>
<th>Rancho Park North</th>
<th>Borax Lake</th>
<th>Tiefort Basin</th>
<th>Scotts Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz crystal</td>
<td>14</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Shell bead/ornament</td>
<td>22</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>46</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Bone bead</td>
<td>5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
<td>Bone tool</td>
<td>49</td>
<td>9</td>
<td>--</td>
<td>8^b</td>
<td>2</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
<td>Total artifacts</td>
<td>24136</td>
<td>7833</td>
<td>89</td>
<td>174</td>
<td>4276</td>
<td>5052</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>1 x 1 m units excavated</td>
<td>68.75</td>
<td>37</td>
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<td>--</td>
<td>68^b</td>
<td>49</td>
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</tr>
<tr>
<td>m3 excavated</td>
<td>123.45</td>
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<td>--</td>
<td>35.1</td>
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</tr>
<tr>
<td>Shell (marine)(grams)</td>
<td>--</td>
<td>71899.3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>48198</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>Shell (marine)(number)</td>
<td>269</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>22590</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Bone (number)</td>
<td>21693</td>
<td>1025</td>
<td>--</td>
<td>--</td>
<td>6377^b</td>
<td>--</td>
<td>1687</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Bone (grams)</td>
<td>9127.35</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fish bone (number)</td>
<td>259^c</td>
<td>3167</td>
<td>--</td>
<td>--</td>
<td>888^b</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Key:
Lake Elsinore = RIV-2798; Windsong Shores = SDI-10965, Gallegos 1991; C.W. Harris site = SDI-149, data taken from Gallegos 1991:40; Allen O. Kelly site = SDI-9649, Koerper et al. 1991; Rancho Park North = SDI-4392, Kaldenberg 1982; Borax Lake = Harrington 1948; Tiefort Basin = SBR-5250, Loci D, E, and F (only these loci are included, because they date to the early Holocene). Formed flake and casual tools are combined into "flaked tool." Bone (number) is NISP, Hall 1993; Scotts Valley = SCR-177, Cartier 1993.

^a Perforator/burin recorded as graver. Flaked cobble and cobble fragments are not included.
^b data from Gallegos 1991:40
^c Includes amphibians and reptiles.
their variation is exactly in phase. I suggest that only a few early Holocene groups organized in small bands inhabited southern California and that a settlement pattern involving relatively frequent moves between the coast and interior may have been sufficient to satisfy kinship relations and subsistence requirements. With a small number of bands spread over many good locations, mobility was stimulated more by the need to interact with other groups than by the need to find resources. These types of groups functioned well in the early Holocene and the system required only relatively minor adjustments to cope with the changes that occurred in the middle Holocene.

**Middle Holocene Site Structure**

During the middle Holocene, broad environmental shifts led to a reduction in resource-rich areas and, as a result, mobile groups became more tethered to these locations. A reduction in good habitation sites forced groups to aggregate in less overall area. Because short-term aggregation was probably practiced for social exchange during the early Holocene, this shift to living in larger groups may not have been such a difficult organizational problem. The site structure data are suggestive of a social organization based around a series of minimum economic units (e.g., families). Although house structures were not recognized in the field, we argue that the patterns are linked to individual economic units. Does this pattern match those found at other middle Holocene sites?
Artifact and ecofact assemblages similar to those recovered from the middle Holocene component at the Elsinore site are rare in the intermediate valley region. Like the early Holocene sites, most of these are poorly documented or were excavated and reported in such a way that makes them difficult to compare with other sites. Because of the extremely large number of middle Holocene sites along the coast and in the deserts, I limited myself to examining only those well-reported or highly relevant sites.

I examined six middle Holocene sites for this section. One of these sites is located in coastal San Diego County, SDI-5130 (Moratto et al. 1994). One is located on the shore of Lake Elsinore—RIV-4045 (Hampson 1992). Two are located in the Carson Desert region of the Great Basin—Hidden Cave (26-Ch-16) (Thomas 1985), and the five recorded Stillwater Marsh sites (26-Ch-1048, -1052, -1055, -1068, -1173) (Raven and Elston 1988). The remaining two sites SBR-5251 (Hall 1993) and the Pinto Basin site (Campbell and Campbell 1935) are in the Mojave Desert region of the Great Basin. Beyond the intersite differences discussed by Raven and Elston (1988), no comparable site level spatial analyses were presented in the site reports. As a result, we use these reports to provide general site locational data more suitable for reconstructing middle Holocene regional settlement patterns.

Although data on middle Holocene intrasite spatial patterning is generally absent in the southern California archaeological literature, data from the Elsinore site demonstrated that a pattern different from the early Holocene is present. I believe that these activity areas demonstrated that a division of labor based on economic units was present during the middle Holocene. The faunal processing area was no longer separate from the floral processing area.
Although this may indicate that a division of labor based on age or sex is no longer present, I instead suggest that these tasks are now being duplicated by each economic unit. I argue that the Elsinore data suggest that a larger band of unrelated people used the site during the middle Holocene.

**Middle Holocene Settlement-Subsistence Systems**

Resources during the middle Holocene were extremely patchy throughout most of southern California. Certain oases, however, were large enough to support a relatively sedentary local population. These oases, which felt few direct effects of the Altithermal, were located along the coast, on the islands, around some desert lakes, and I argue at Lake Elsinore. Except for those sites on the coast, most sites in these locations were relatively small (Table 14). The indirect effect of the Altithermal at these locations was a local increase in population due to an influx of hunter-gatherer groups that were previously highly mobile, using the resources available throughout the region. In effect, we see a shift from seasonal aggregations in the early Holocene to extended aggregations during the middle Holocene.

By definition, patchy resources are aggregated and relatively easy to defend. In southern California territories were of uneven quality and competition for areas like Lake Elsinore was probably intense. In this sort of setting, Cashdan (1983) and others (e.g., Dyson-Hudson and Smith 1978) argue that the benefits of territorial defense outweigh the costs; they predict that a perimeter defense of the territory would be practiced. Surrounding
groups, without access to a good patch of resources, would have to defend a much larger territory, which is more difficult. According to Cashdan's (1983) model, this would be accomplished through the use of social boundary defense (i.e., denying access to the group). Defending social boundaries works where the small, wide-ranging groups still required access to other bands for reasons such as social exchange. Cashdan (1983:51) predicts the strategy of cooperating with the social boundaries exceeds the benefits of trespassing across territories when (1) interaction between the groups is likely to continue, (2) the intruders value information exchange, (3) there is a probability of being detected, and (4) there is a value to reciprocal access to the group. Because group size was relatively small, interaction between those that maintained small defendable territories and those that maintained large territories was necessary and probably relatively common. Group size during the middle Holocene was still well below the number of people needed for a viable population.
Table 14. Comparison of Middle Holocene Assemblages.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Elsinore Locus C</th>
<th>Stillwater Marsh</th>
<th>Tiefort Basin</th>
<th>Hidden Cave</th>
<th>RIV-4045</th>
<th>Pinto Basin</th>
<th>San Luis Rey</th>
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<tbody>
<tr>
<td>Projectile Point</td>
<td>2</td>
<td>53</td>
<td>36</td>
<td>284</td>
<td>6</td>
<td>173+</td>
<td>44</td>
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<tr>
<td>Biface</td>
<td>30</td>
<td>29</td>
<td>119</td>
<td>39</td>
<td>15</td>
<td>–</td>
<td>6</td>
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<tr>
<td>Flake Tool¹</td>
<td>–</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>–</td>
<td>P</td>
<td>35</td>
</tr>
<tr>
<td>Chopper</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8</td>
<td>–</td>
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<tr>
<td>Hammer stone</td>
<td>21</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>29</td>
<td>P</td>
<td>27</td>
</tr>
<tr>
<td>Scraper</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>5</td>
<td>97</td>
</tr>
<tr>
<td>Core</td>
<td>21</td>
<td>1</td>
<td>24</td>
<td>1</td>
<td>25</td>
<td>–</td>
<td>71</td>
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<tr>
<td>Core/cobble tool</td>
<td>–</td>
<td>–</td>
<td>24</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mano</td>
<td>30</td>
<td>21</td>
<td>16</td>
<td>11</td>
<td>16</td>
<td>23</td>
<td>216</td>
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<tr>
<td>Metate</td>
<td>14</td>
<td>42</td>
<td>158</td>
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<td>3</td>
<td>24</td>
<td>96</td>
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<tr>
<td>Ground stone</td>
<td>47</td>
<td>20</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>59</td>
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<tr>
<td>Mortar</td>
<td>5</td>
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<td>–</td>
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<tr>
<td>Pestle</td>
<td>–</td>
<td>14</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Bone tool</td>
<td>14</td>
<td>28</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>23</td>
</tr>
<tr>
<td>Total tools</td>
<td>202</td>
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<td>496</td>
<td>344</td>
<td>113</td>
<td>414+</td>
<td>980</td>
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<tr>
<td>Debitage</td>
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<td>1,334</td>
<td>8,839</td>
<td>56</td>
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<td>1,344²</td>
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<td>13</td>
<td>1</td>
<td>–</td>
<td>5</td>
<td>1</td>
<td>–</td>
<td>6</td>
</tr>
<tr>
<td>Ornament²</td>
<td>55</td>
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<td>7</td>
<td>9</td>
<td>2</td>
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<td>80</td>
</tr>
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<td>20,598</td>
<td>2,921</td>
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<td>–</td>
<td>3,730</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Potsherd/clay artifact</td>
<td>–</td>
<td>28</td>
<td>88</td>
<td>–</td>
<td>3</td>
<td>–</td>
<td>152</td>
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<tr>
<td>Marine shell</td>
<td>256</td>
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<td>1,314</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>14,849</td>
</tr>
<tr>
<td>1 x 1 m units excavated</td>
<td>32</td>
<td>30</td>
<td>70.5</td>
<td>8</td>
<td>–</td>
<td>–</td>
<td>107</td>
</tr>
<tr>
<td>m² excavated</td>
<td>56.725</td>
<td>70.1</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

KEY: P = present

¹Retouched flakes and knives not counted as bifaces.
²Analyzed debitage.
³Includes bone, stone and shell beads, pendants and other objects.
The subsistence shift that accompanied this settlement change was relatively minor. We argue that earlier groups were already exploiting the available seed crops and an appropriate ground stone technology was in place to accomplish these tasks. Although the addition of acorns to the diet is not clear until the late Holocene (inferred from the presence of mortars and pestles), we argue that acorns were probably used earlier. Rabbits and small game remained the main meat-providing animal. A general lack of early and middle Holocene–style projectile points indicates that larger animals were hunted but that they played a relatively minor role in subsistence. This pattern of subsistence probably required small task groups to visit resource procurement sites away from the lake. This system may have approximated the collector adaptation outlined by Binford (1980) and discussed by many archaeologists. Although a broadening of the resource base allowed for an aggregation of populations around the lake, the adjustments in the social system were more critical to such aggregation. Fortunately, the mechanism to cope with large local groups was in place from the early Holocene and required only minor refining to extend the length of localized aggregation. This form of extended occupation by a collection of unrelated groups, probably paved the way for village life that developed in the late Holocene.

FINAL THOUGHTS: THE LATE HOLOCENE AND BEYOND

Clearly the suggestions outlined above call for a re-evaluation of the argument that subsistence changes were “accompanied” by modifications in lifestyles. I can confidently
argue that the shift in social organization seen at the Elsinore site during the Transitional period was not directly associated with a shift from hunting to collecting. I argue that social and economic change are inextricably linked and that changes in subsistence did not directly lead to social organizational change. Indeed, a flexible subsistence strategy may have been reinforced by a need to respond to settlement shifts and social organization dynamics. The impetus for change, however, is no doubt multicausal. Primary factors include the changing environment and the need to have ready access to a shrinking supply of resources.

I hypothesize that early groups were highly mobile social units organized in small (probably single-family) bands. These groups were probably somewhat tethered to resource-rich locations that served as meeting areas for different groups to facilitate social exchange. An environmental shift during the middle Holocene probably reduced the amount of resource-rich area and led to extended aggregations of groups in those good locations. Because of the diversity and availability of resources, the Elsinore site served as one of these critical locations.

Although the site failed to yield much of the critical data necessary to address changes in social organization between the middle and late Holocene, I can speculate about the proposed causes. I found no evidence to contradict the argument proposed by True and Waugh (1982), that the shift was a response to many factors. Probably primary among these was a need to control access to resources that became less predictable as the environment destabilized. I believe the necessary preconditions for village life and more-complex social organization were established early in the human occupation of the region. The changes
evident at the Elsinore site suggest slow but fundamental changes took place throughout the Holocene. Clearly, during the late Holocene, an extended habitation was not present at the Elsinore site. Based on other archaeological investigations in the region, however, major habitation sites were located close to the lake.

In the end, it seems appropriate to come full circle and reevaluate Hudson's (1978) statement about life on the shores of Lake Elsinore.

The lake—Etengvo Wumoma to the Indians, Laguna Grande to the Mexicans, and Lake Elsinore to Americans—has always been a source of pleasure. But at times it has also been a source of grief and discomfort. Yet the lake is here. Nature put it here and here it no doubt will always be—at times a blessing and at times a problem. Perhaps one of its greatest attributes has been as a character builder; for it has presented a challenge to all of those who live on its shores...

It is probably true that the lake was a source of pleasure for the prehistoric populations that lived there. In fact, throughout the Holocene, the lakeshore served as an excellent location to procure small game, waterfowl, and floral resources. Hudson's claim that the lake was also a source of grief and discomfort probably applies more to the middle and late Holocene populations that used its shores. What were the challenges to lacustrine life?

During the middle Holocene, climatic change decreased the resources that were previously available throughout the region. Although this climatic change did not directly affect the lakeshore residents, the indirect effect was that more people began using the lake for longer periods of time. This not only required technological and subsistence change but, more important, also required organizational changes in the social system. During the late Holocene, the modern-day pattern of fires followed by destructive floods probably destroyed the site's
usefulness for relatively sedentary villages. The notion of how to live the village lifestyle was established at settings like the Elsinore site. Much like the attraction to the historical-period visitors that stayed at the Lake View Hotel, pleasure during the late Holocene may have derived from the hot springs that flowed into the small lagoonal area. If the ethnographic record is correct, groups from all over southern California probably came to the spot to receive the healing powers of the springs.

Finally, I feel Hudson's description of the lake as a character builder may be more appropriately directed at those involved in this project, for it has led us to challenge our notions of prehistory. Conventional wisdom argues that subsistence strategies were altered in response to environmental changes and that culture change followed these alterations. Here I argue that the Elsinore data contradicts this interpretation of prehistoric culture change. I have found that social organization served as the primary adaptive mechanism that drove culture change and that subsistence was highly diversified very early in prehistory. Although the focus was on small game and floral resources, the lake provided a stable secondary set of resources that served as a buffer to terrestrial resource failure, to say nothing of the precious resource of a dependable water supply. Although this pattern could be unique to Lake Elsinore, my review of regional data suggests that this is not the case. Unfortunately, California archaeologists seem content to force sites into an antiquated view of the region, leaving a static view of prehistory constrained more by budgets than by a lack of information.
REFERENCES CITED

Ahlborn, William O.

Altschul, Jeffrey H., and Christopher J. Doolittle

Altschul, Jeffrey H., and Donn R. Grenda (editors)

Altschul, Jeffrey H., Martin R. Rose, and Michael K. Lerch

Altschul, Jeffrey H., Carla Van West, and Patricia Teltser

Ames, Kenneth M.

Antevs, Ernst

Arnold, Jeanne E.


Axelrod, D. L.

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Bancroft, Hubert H.

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Basgall, Mark E., and Delbert L. True


Bedwell, S. F.

Bettinger, Robert L.


Bettinger, Robert L., and Martin A. Baumhoff


Binford, Lewis R.


Bird-David, Nurit
Birdsell, Joseph B.


Bleitz, Dana E., and Roy A. Salls

Bohannan, Paul J.

Bolton, H. E. (editor)

Boscana, Friar Geronimo

Boserup, Esther

Bowers, Doris

Braidwood, Robert J.

Bull, Charles S.

Butler, William B.

Campbell, Elizabeth W. and William H. Campbell


Carbone, Larry A.

Carlson, R. L.
Carr, C.  

Carrico, Richard L.  

Cartier, Robert  

Cartier, Robert (editor)  
1993  *The Scotts Valley Site: CA-SCR-177*. Santa Cruz Archaeological Society, Santa Cruz.

Cashden, Elizabeth  

Cauch, Altha Merrifield (compiler)  

Chartkoff, Joseph L., and Kerry K. Chartkoff  
Colten, Roger

Colten, Roger, and Jon M. Erlandson

Cook, Sherburne F.

Davis, Emma Lou

Davis, E. L., C. W. Brott, and D. L. Weide

Davis, Owen K.

de Barros, P., and H. C. Koerper
1990  Final Test Investigation Report and Request for Determination of Eligibility for 23 Sites along the San Joaquin Hills Transportation Corridor. Report prepared for Transportation Corridor Agencies, Costa Mesa, California. Chambers Group, Santa Ana, California.
Deevy, E. S., and R. F. Flint

Del Chario, Kathleen C.

Denbow, J. R.

Desautels, Roger J.
1978 The Test Excavations of Seven Archaeological Sites within the Proposed AWMA Project in the Lower Aliso Creek Corridor, Orange County, California. Scientific Resource Surveys, Inc., Santa Ana, California.

Dixon, Keith A.


Donnan, C. B.

Drover, Christopher E, H. C. Koerper, and P. E. Langenwalter II
Du Bois, C. G.


Duffield, Anne Q.

Dyson-Hudson Rada, and Eric Alden Smith

Eberhart, Hal


Eberhart, Hal and W. Wasson

Elliot, W. W.
Elston, Robert G.


Engelhardt, Z.
1921 *San Luis Rey Mission*. James H. Barry, San Francisco.

Erlandson, Jon M.


Erlandson, Jon M. and Roger H. Colten

Erlandson, Jon M., Roger H. Colten, and Michael A. Glassow

Ezell, Paul H.
Feng, Xiahong, and Samuel Epstein  

Fladmark, Knut R.  

Fowler, P.  

Freeman, Trevor A. and David M. Van Horn  

Gallegos, Dennis R.  


Gallegos, Dennis R. and Richard Carrico  
Gallegos, Dennis R. and Susan M. Hector (editors)  

Gargett, Rob, and Brian Hayden  

Gifford, E. W.  


Glassow, Michael A.  

Glassow, Michael A. and Larry Wilcoxon  

Glassow, Michael A., Larry Wilcoxon, and Jon M. Erlandson  
Goldberg, Susan K., and Jeanne E. Arnold

Gordon, R. J.

Gould, Richard A.
1978 *Explorations in Ethnoarchaeology.* University of New Mexico Press, Albuquerque.

Gregg, Susan A., Keith W. Kintigh, and Robert Whallon

Grenda, Donn R.

1995 *Prehistoric Game Monitoring on the Banks of Mill Creek: Data Recovery at CA-RIV-2804, Prado Basin, Riverside County, California.* Statistical Research Technical Series No. 52. Tucson.


1997 *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore.* Statistical Research Technical Series No. 59, Tucson.
Grenda, Donn R. and Jeffrey H. Altschul

1994b Cultural Geography in the Long Beach Area. Paper presented at the Annual 
Meeting of the Society for California Archaeology, Ventura, California.

1995 Islanders and Mainlanders: A Regional Approach to Channel Island Prehistory. 
*Pacific Coast Archaeological Society Quarterly* 31(3):28–38.

Grenda, Donn R. and Deborah W. Gray
1997 *Hunting the Hunters: Archaeological Testing at CA-RIV-653 and CA-RIV-
1098, Riverside County, California.* Statistical Research Technical Series 
No. 65, Tucson.

Grenda, Donn R. and Michael Hogan
1997 Micro- and Macrobotanical Analyses. In *Continuity and Change: 8,500 
Years of Lacustrine Adaptation on the Shores of Lake Elsinore.* Pp. 101-

Grenda, Donn R., Jeffrey A. Homburg, and Jeffrey H. Altschul
1994 *The Centinela Site (CA-LAN-60): Data Recovery at a Middle Period, Creek-Edge 
Site in the Ballona Wetlands, Los Angeles County, California.* Statistical Research 
Technical Series No. 45. Tucson.

Hall, Matthew C.
1993 *Archaeology of Seven Prehistoric Sites in Tiefort Basin, Fort Irwin, San 
Bernardino County, California.* Report prepared for the U.S. Army Corps of 
Engineers, Los Angeles District. Report prepared by Far Western Anthropological 
Research Group, Davis, California.

Hampson, R. Paul
1991 *Cultural Resources Survey and Test Excavation, Lake Elsinore, California.* 
Report submitted to the U.S. Army Corps of Engineers, Los Angeles District. 

Harding, M.

Harpending, Henry and Herbert Davis

Harrington, John P.


Harrington, M. R.
1948  *An Ancient Site at Borax Lake, California.* Southwest Museum Papers No. 16.

Hayden, Julian D.
Heizer, Robert F.

Henshaw, H. W.

Heusser, L.

Hietala, Harold

Homburg, Jeffrey A. and David D. Ferraro

Howard, William C., and L. Mark Raab

Hubbs, Carl L.
1960 Recent Climate History in California and Adjacent Areas. *Proceedings Conference on Recent Research in Climatology, University of California Water Resources Center Contribution* No. 8.

Hudson, Tom

Hughes, Richard E. and Delbert L. True

Jackson, B. J.

Janetski, Joel C.

Jelinek, Arthur J.

Jertberg, Patricia M.
1978 *A Qualitative and Quantitative Analysis of Relationships of the Eccentric Crescent and Its Value as an Indicator of Culture Change*. Unpublished master's thesis, Department of Anthropology, California State University, Fullerton.

Jochim, Michael A.

Johnson, John R.


Johnson, K. L.

Jones, Carleton S.

Jones, Kevin T.

Jones, Terry L.

Kahn, M. I., T. Oba, and T. L. Ku

Kaldenberg, Russell L.

Kaldenberg, Russell L., and Paul H. Ezell
1974 Results of the Archaeological Mitigation of Great Western Sites A and C, Located on the Proposed Rancho Park North Development near Olivenhain, California. Manuscript on file, San Diego State University, Department of Anthropology.

Keller, Jean S., and Daniel F. McCarthy
1989 Data Recovery at the Cole Canyon Site (CA-RIV-1139), Riverside County, California. Pacific Coast Archaeological Society Quarterly 25 (1).

Kelly, Robert L.


Kent, Susan

Koerper, Henry C.

Koerper, Henry C., J. S. Killingley, and R. E. Taylor
Koerper, Henry C., Paul E. Langenwalter, and Adella Schrott

Kowta, Makoto

Kroeber, Alfred L.


Kyle, C., R. L. Phillips, and Dennis R. Gallegos
Larson, Daniel O., John R. Johnson, and Joel C. Michaelson

Larson, Daniel O. and Joel Michaelson
1989 *Climatic Variability: A Compounding Factor Causing Culture Change among Prehistoric Coastal Populations.* Paper on file, Department of Anthropology, California State University, Long Beach.

Leakey, L. S. B., R. D. Simpson, and T. Clements

Lee, Richard B.


Lee, Richard B., and I. DeVore (editors)
1968 *Man the Hunter.* Aldine, Chicago.

Lerch, Michael K.
1987 *Archaeological Studies at the Elsinore Site: Test Excavations at CA-RIV-2798, Lake Elsinore, Riverside County, California.* Archaeological Research Unit, University of California, Riverside. Submitted to Elsinore Valley Municipal Water District.
Lerch, Michael K. and Gerald A. Smith

Lord, Martin A.

Madsen, David B.


Malthus, Thomas R.

Mason, Roger
1996 *Results from the Newport Coast Archaeological Project.* Paper presented at the 1996 Quarterly Meeting of the Pacific Coast Archaeological Society.

Martz, Patricia
1984 *Social Dimensions of Chumash Mortuary Populations in the Santa Monica Mountains Region.* Ph.D. dissertation, Department of Anthropology, University of California, Riverside. University Microfilms, Ann Arbor.

Meighan, Clement W.


Meighan, Clement W. and C. Vance Haynes

Moffitt, Linda R.

Moratto, Michael J.

Moratto, Michael J., and Roberta S. Greenwood

1994  *Archaeological Investigations at Five Sites on the Lower San Luis Rey River, San Diego County, California*. INFOTEC Research, Fresno, California.

Moriarty, James R., III


Owen, Roger C.


Oxendine, Joan

Parkington, John E.

Pisias, N. G.

Price, T. Douglas and James A. Brown

Quillen, Dennis K., Richard L. Carrico, and Dennis Gallegos
1984 *Archaeological Investigations at SDi-5130, Mar Lado Project, Oceanside, California*. WESTEC Services.

Raab, L. Mark

1997  The Southern Channel Islands during the Middle Holocene: Trends in Maritime Cultural Evolution. In *Archaeology of the California Coast during the Middle Holocene*, pp. 23-34, edited by Jon M. Erlandson and Michael A. Glassow.

Raab, L. Mark, Judith F. Porcasi, Katherine Bradford, and Andrew Yatsko

Raab, L. Mark and Andrew Yatsko

Raven, Christopher, and Robert G. Elston (editors)

Rogers, Malcolm J.


Rowlands, M.

Sails, Roy A.
1983 *The Liberty Grove Site: Archaeological Interpretations of a Late Millingstone Site on the Cucamonga Plain*. Master's thesis, Department of Anthropology, California State University, Los Angeles.


Sails, Roy A., L. Mark Raab, and Katherine Bradford
San Luis Rey Historical Society

Schiffer, Michael B.


Schrire, Carmel


Shanks, Michael and Christopher Tilley
1987 *Social Theory and Archaeology*. University of New Mexico Press, Albuquerque.

Silberbauer, G.

Simpson, James H.

Smith, Brian F.
Sparkman, P. S.


Statistical Research, Inc.

Stevenson, Marc G.

Steward, Julian H.


Strand, Jennifer

Strong, William D.

Strudwick, Ivan

Sturm, Bradley L.

Suchey, Judy M.

Tadlock, W. Lewis

Tainter, Joseph A.

Tanaka, J.
Tartaglia, Louis James

Thomas, David Hurst


Tilley, Christopher
Torrence, Robin

Towner, Ronald H., Keith B. Knoblock, and Alex V. Benitez

Treganza, Adan E., and Agnes Bierman

True, Delbert L.


True, Delbert L., Clement W. Meighan, and Harvey Crew

True, Delbert L. and R. Pankey
True, Delbert L., R. Pankey, and Claude N. Warren

True, Delbert L. and G. Waugh


Van Devender, T. R., and W. G. Spaulding

Vanderpot, Rein, Jeffrey H. Altschul, and Donn R. Grenda


Walker, Phillip L., and Pandora E. Snethkamp

Wallace, William J.


Wallace, William J., and Francis A. Riddell (editors)  
1991  *Contributions to Tulare Lake Archaeology I: Background to a Study of Tulare Lake's Archaeological Past*. The Tulare Lake Archaeological Research Group, Redondo Beach, California.

Warren, Claude N.  
1964  *Cultural Change and Continuity on the San Diego Coast*. Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.


Warren, Claude N., and M. G. Pavesic  

Warren, Claude N. and Delbert L. True  

Warren, Claude N., Delbert L. True, and A. A. Eudey  

Weide, Margaret L.  

Wheat, Margaret M.  

White, R. C.  

Wilcoxon, Larry, Jon M. Erlandson, and D. Stone  
Wilke, Philip J.

Wilmsen, E.


Wilmsen, E. and J. Denbow

Winterhalder, Bruce and Eric A. Smith (editors)

Wlodarski, Robert J., John F. Romani, and Dan A. Larson
1989 *Archaeological Investigations at CA-ORA-1103, a Late Period Site along Ortega Highway, Lower San Juan Creek, Orange County, California.* *Pacific Coast Archaeological Society Quarterly* 25(2):31–44.

Wobst, H. M.

Woodburn, J.
Yellen, John