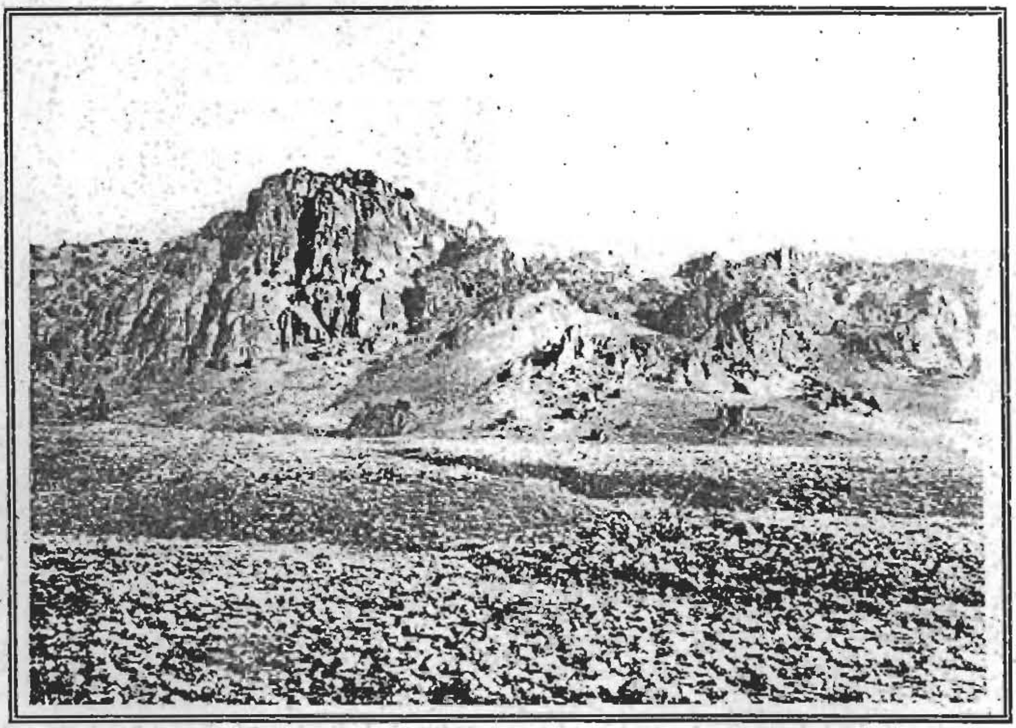
BLM - LOANER COPY

Bureau of Land Management
California

ARCHAEOLOGICAL EXPLORATIONS IN SHASTA VALLEY, CALIFORNIA

By

Blossom Hamusek, Eric W. Ritter, and Julie Burcell



cultural resources publications
archaeology

Frontispiece: C.E. Watkins photograph of Sheep Rock in Shasta Valley (view south). Photo taken around 1870 while Watkins was a member of the United States Geological Exploration of the Fortieth Parallel party under Clarence King. Plate #70 of the expedition on file with the United States Geological Survey in Denver. Photo provided by Special Collections, Meriam Library, California State University, Chico.

Bureau of Land Management
California

ARCHAEOLOGICAL EXPLORATIONS IN SHASTA VALLEY, CALIFORNIA

By

Blossom Hamusek, Eric W. Ritter, and Julie Burcell

cultural resources publications
archaeology

Bureau of Land Management, Redding Field Office
Redding, California
1997

ABSTRACT

The Bureau of Land Management has proposed the disposal of approximately 4300 acres in eastern Shasta Valley, Siskiyou County. These lands are scattered in 17 parcels. Intensive (Class III) archaeological inventory was completed for these parcels with the exception of one parcel and a portion of a second that were subsequently dropped from the disposal action due to important cultural values. The overall inventory resulted in the documentation (or re-documentation) of 40 lithic scatters, three occupation sites with midden, two rockshelters with midden, three presumed temporary occupation/seasonal camps, three rock enclosures, nine historic rock walls, three historic trails, two cattle camps, and one historic can scatter (66 sites total). There were also 150 isolates, mostly prehistoric flaked stone remains, minimally documented. A concentration of sites of varied complexity and type was found in the vicinity of Sheep Rock. Native American informants (Shasta) also identified this geographical area as a sacred place.

Development of research issues and a historic context framework, centered on culture history/chronology, settlement/subsistence/economics, lithic technology and procurement, exploration/transportation, and livestock management aided in evaluating site significance. Considerable archival research, informant interviews, resource documentation, subsurface exploration, and artifact analyses contributed to the National Register of Historic Places evaluations.

Both the prehistoric and historic remains reflect apparent cultural marginality and conservatism. Prehistoric remains range from Early Archaic into late prehistoric times, primarily associated with logistically-oriented foragers and hunters using valley-edge residential bases. Pulses in the activities over time are evident, perhaps related to environmental stress. There is little evidence in the parcels to suggest a high demographic profile. Historic sites correlate with sheep and cattle grazing, cattle drives, and early exploration and travel/transportation. Euroamerican occupation sites are limited, short-term locations related to grazing and, perhaps, wood cutting. The concentration of prehistoric sites around Sheep Rock is not a surprise when considering modern Native American oral traditions and ethnographic data. This area, favored by prehistoric peoples, was also a focus of later historic activities, a reflection of Sheep Rock's landmark status, terrain configuration, and hydrology.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The following report summarizes the results of a cultural resource inventory and limited site testing of approximately 4300 acres of U.S.D.I., Bureau of Land Management (BLM) lands located in and around the eastern margins of Shasta Valley, Siskiyou County, California (Figure 1). The archaeological field work provided a reasonable body of data for interpretive and exploratory discussion.

The Bureau of Land Management is in the final (1998) stages of the proposed sale and/or administrative transfer of 17 scattered parcels within Siskiyou County composing the above acreage which would result in a change of ownership. The National Historic Preservation Act (NHPA) of 1966, amended 1980 (16 U.S. C. 470), and the Advisory Council on Historic Preservation have set forth procedural requirements which must be met prior to land disposal decisions (36 CFR 800). Included as part of these requirements is the identification of all cultural resource properties located on the federal lands which are on, or might be eligible for inclusion in the National Register of Historic Places. Identification of such properties may be obtained through archival research as well as field inspection of the parcels under investigation. Information obtained as a result of this investigation would then be used to: (1) evaluate site significance in relation to eligibility criteria for inclusion in the National Register of Historic Places; (2) anticipate potential impacts to these resources should they be transferred from federal ownership; (3) and develop appropriate recommendations in order to assist in future cultural resource management of these sites.

During the course of the prefield research associated with this project, it became apparent that relatively limited attention has been directed to the reconstruction of the Native American culture history or prehistoric occupation of Shasta Valley. Aside from a few pioneering efforts there has largely been a reliance on extrapolations of data and sequences from nearby contiguous regions. Moreover, although ethnographic and historical data provide some indication as to the manner in which post-contact Native American inhabitants adapted to Shasta Valley and the surrounding regions, these data are fragmentary and say virtually nothing of earlier populations in the area. Since these data sets fail to provide the long-term perspective useful in answering questions of origins and cultural dynamics operating through time, it falls upon archaeological research to attempt to remedy the deficiency in our understanding of the area. The historic record for Euroamerican settlement, on the other hand, is far more complete.

Because the present state of knowledge pertaining to prehistoric occupation within Shasta Valley is limited, one of the basic goals of any research project undertaken within the region should be to augment the baseline data to better interpret the archaeological record.

Map of Siskiyou County

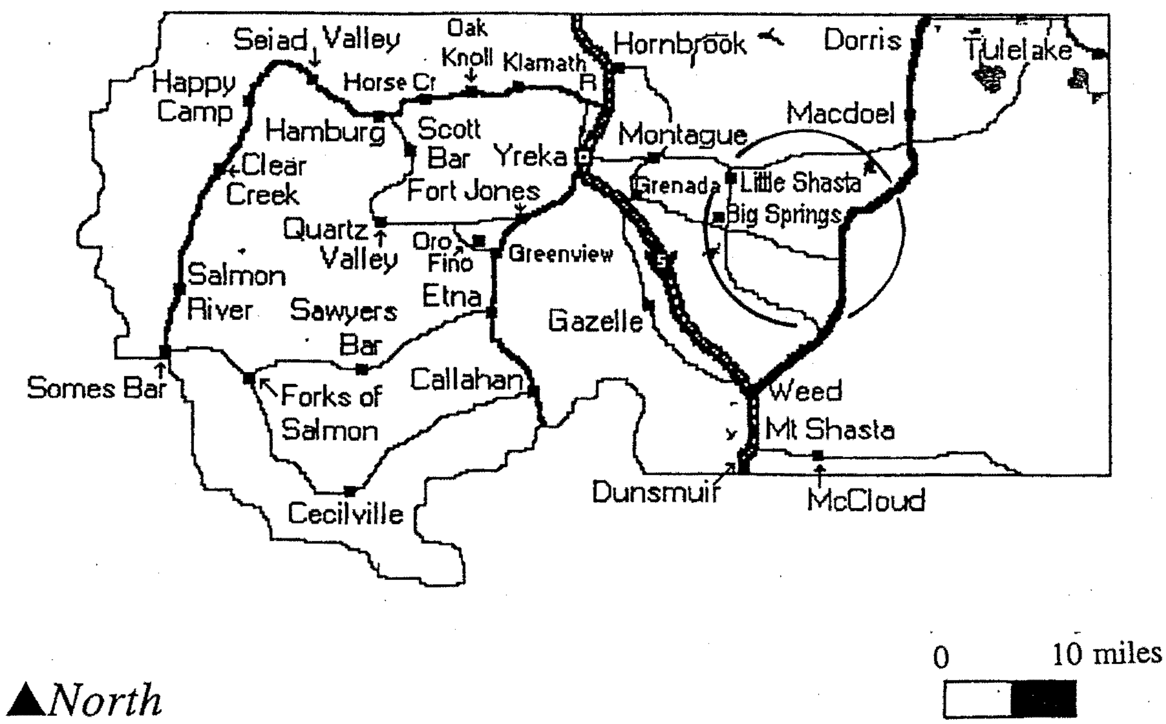


Figure 1: Project Vicinity Map

Accordingly, the present investigation has as its principal objective the gathering of information which would provide data necessary to assess the cultural/historical and scientific research potential of the resources in question. Secondly, it is hoped that recovered data, based primarily on surface and limited subsurface examinations, will provide models and refined hypotheses regarding the culture history, lifeways and social changes that can be related to the prehistoric and historic peoples of the region. From the beginning, we acknowledged that there would be restrictions on our research orientation based on the biased nature of our study (e.g., parcels selected based on the nuances of history) and a limited regional data base from which it would be possible to formulate well-developed and site-specific research questions. Furthermore, there were the usual temporal, monetary and labor constrictions that are associated with any project of this magnitude. Nonetheless, it was deemed realistic to examine at least limited aspects of the historic and prehistoric lifeways and culture dynamics reflected in the material remains present at the sites in the study area.

Fieldwork was conducted during the months of July through October, 1995. Analysis and report preparation were undertaken from October, 1995 into February, 1996. Dr. Eric Ritter, serving as Principal Investigator for the project, supervised all aspects of fieldwork and preparation of the final report. Ms. Blossom Hamusek served as Project Director, and coordinated and carried out the fieldwork and analysis phases of this project. The field crew consisted of experienced and *volunteer* archaeologists from BLM staff and included: Julie Burcell, Julie Pfilf, Howard Matzat, Kathy Pacini, Patricia Ritter, and Trish Moehle. BLM Area Manager Charles Schultz assisted one day in the test excavations and BLM Geologist Ron Rogers and Botanist Joe Molter, each with archaeological training, provided independent observations regarding parcel environments and archaeological discoveries.

The following report presents the results of our investigations within the Shasta Valley region. In Chapter 2, a brief summary regarding the environmental setting of the region is presented. Chapter 3 discusses the cultural context of the study area focusing on the archaeological and historical background data pertinent to the region. Separate sections of this chapter present brief summaries of the archival research undertaken and the state of archaeological, ethnographical, and historical knowledge as currently understood for the study area. Chapter 4 outlines the research approach undertaken for the project, and the methods employed to achieve the goals identified are discussed in Chapter 5. The results of the reconnaissance program and those of the testing program are discussed in detail in Chapter 6 in relation to the archaeological research hypotheses presented in earlier chapters. The final two chapters conclude the report with a synthesis of the data obtained in relation to the hypotheses considered, and offer conclusions, site evaluations, and management options and recommendations regarding the cultural resources.

C. E. Watkins photograph of Shasta Valley, west side, looking southeast toward Black Butte. Taken around 1870 while Watkins was a member of the United States Geological Exploration of the Fortieth Parallel party under Clarence King. Plate # 74 of the expedition on file with the United States Geological Survey, Denver. Photo provided by Special Collections, Meriam Library, California State University, Chico.

CHAPTER 2

ENVIRONMENTAL BACKGROUND

Physiography and Hydrology

The various parcels which make up the study area are located within the Cascade Range physiographic province, between the Klamath Mountain Range to the west and impinging on the Cascade Mountain Range on the east. More specifically, the parcels are situated both within Shasta Valley proper, and along the adjacent foothills and mountain slopes on the eastern edge of Shasta Valley. These parcels lie approximately 15 to 20 air miles east-southeast of Yreka, Siskiyou County, California. The headwaters of Willow Creek mark the approximate northernmost boundary of the project area, while the southern edge ends at the southern base of Sheep Rock. The western edge of the project area lies within Shasta Valley and the eastern boundary is demarcated by the Cascade crest with mountain peaks such as Goosenest and Herd Peak (Figure 2).

Elevations within the project area range from a low of 2600' within Shasta Valley itself, along the western border of the project, to 5800' in the eastern sections by Herd Peak and Sheep Rock. In general, the terrain throughout the northern and eastern portions of the project area is steep and rugged. Physiographic features such as ridgetops and precipitous cliffs and/or canyons are common, especially within the Sheep Rock area. Throughout this region, however, there are a number of benches and narrow southwesterly trending ridges. Some of the most level ground encountered within the project area was found along the southern and western portions, within Shasta Valley near Owls Head and along Juniper Flat.

Hydrology of the project area is dominated by numerous permanent and intermittent streams which flow westerly from the Cascade crest to the Shasta Valley. The principal drainages within the parcel's vicinity are the Shasta River, which was dammed to form Lake Shastina, and Little Shasta River, both of which drain into the ocean-bound Klamath River drainage system. Some of the more important secondary drainages include Dewey Gulch, Walbridge Gulch, and Spring Creek. In addition to secondary drainages, springs and seeps were also commonly found throughout the project area.

Geology, Geomorphology, and Soils

The geology of the project area has been described and mapped by Williams (1949), Kim and Blank (1970), and Macdonald (1966); however, the most detailed studies conducted in the project area, upon which the following summary is based, are those of Macdonald (1966) and Rogers (1996).

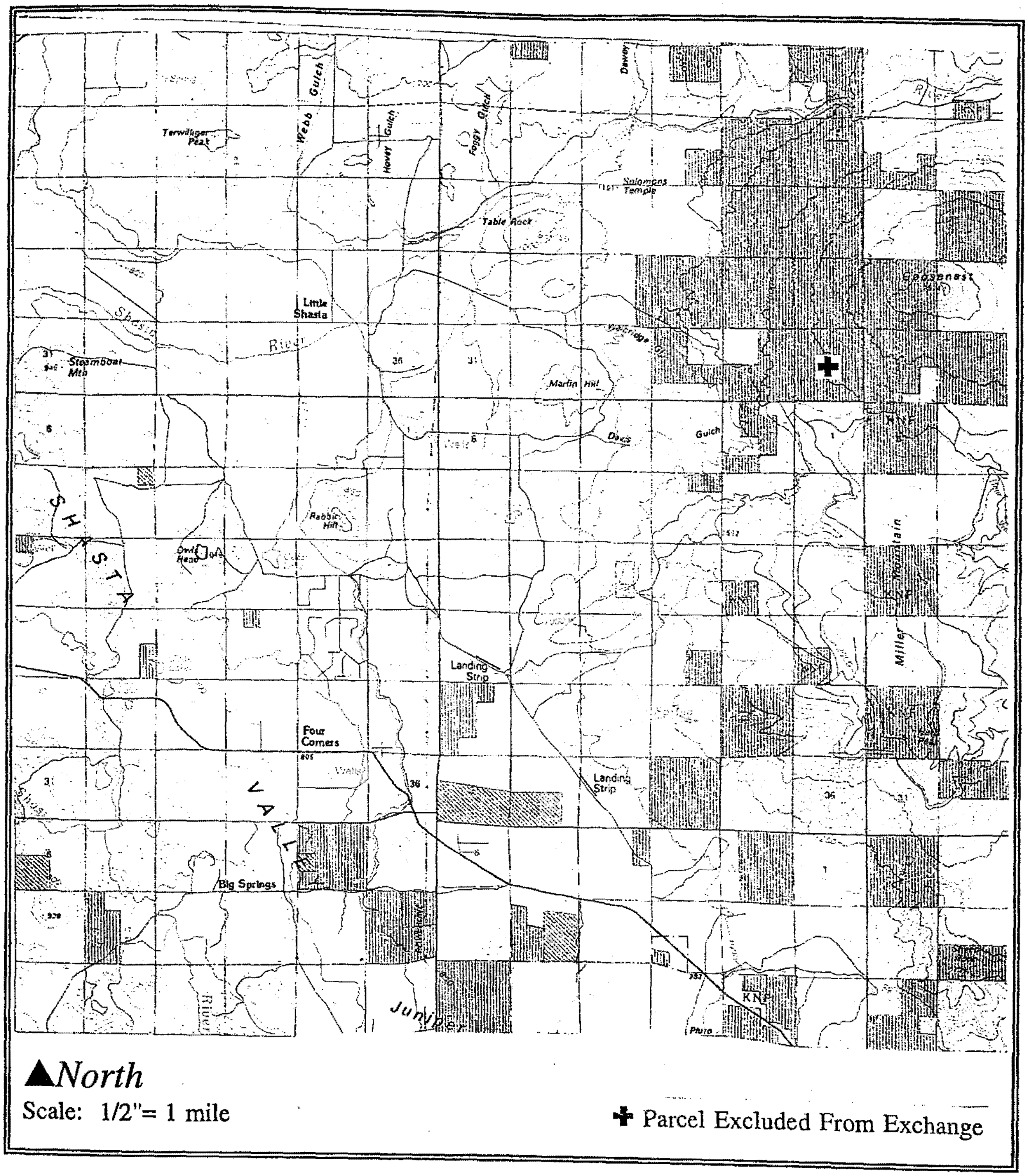


Figure 2: Federal Land Parcels for Disposal

The Western Cascades consist of Pre-Cambrian sedimentary formations overlain by more recent Quaternary and Tertiary volcanics. Earlier volcanics, referred to as the Western Cascade series, were faulted and tilted to the east-northeast at the end of the Miocene; however, the trend abruptly changes to southeastward at Mount Shasta (Macdonald 1966). At this southern end the rocks of the Cascade Range and the Modoc Plateau are found to overlap the metamorphic and plutonic rocks of the Sierra Nevada (Macdonald 1966:65).

Most of the volcanism that has occurred within the greater region has been basaltic andesite and some rhyolite producing large composite cones such as Mount Shasta and Mount Lassen (Macdonald 1966:63-96). Scattered throughout the region, beyond the study area, however, are a number of late extrusions that produced a series of basalt and rhyolite glass or obsidian outcrops which served as a source of raw materials commonly used in prehistoric flake stone tool production. Principal among these is the Medicine Lake Highland field located some 36 air miles to the east. Ten spatially discrete obsidian geochemical groups have been located within the Medicine Lake Highland field producing a very complex geochemical pattern (Hughes 1983). Recent archaeological investigations indicate that this source area contributed significantly to prehistoric lithic raw material assemblages in both the immediate and surrounding regions (Basgall and Hildebrandt 1989; Gilreath et al. 1995; Nilsson 1985a).

At Sheep Rock, beds of coarse andesitic tuff-breccia containing angular to subangular blocks up to four feet across in a tuffaceous matrix reach a thickness of 1600 feet, and are interpreted as being the products of volcanic mudflows (Williams 1949:23). Several rhyolite domes are found in the vicinity of Little Shasta and volcanic necks and plugs of andesite and basalt occur throughout Shasta Valley (Macdonald 1966).

As observed by Macdonald (1966:70), "In many andesites, (within the Western Cascades) veins and amygdules of opal and chalcedony are abundant, and silicified wood may be occasionally encountered." This observation holds especially true for the western side of the Sheep Rock to Willow Creek Mountain range where local concentrations of chalcedony and jasper are commonly encountered. These concentrations have weathered out from the basic igneous rock and have become incorporated in colluvial deposits. Shasta Valley is an intermontane basin formed on its eastern side by volcanic features of the Cascade Range and consists of young alluvial fans and old terraces. It is dotted with small hills and is about 28 miles long and averages 10 miles in width (Newlun et al. 1983:2). It is probable that some valley-edge features below Herd Peak may be mammoth ancestral landslide features which have since been lightly to moderately dissected.

Also noted within some portions of the Sheep Rock locality were areas of large schollendomes. Schollendomes are a type of geologic feature which have been formed by the tilted and broken solidified crust of a former lava flow. Molten lava, draining out from beneath its already solidified crust will cause the collapse of the crust into a very rough landscape made up of small sag basins and vertical-walled collapsed pits called schollendomes (Waters 1981:152). These schollendomes are typically surrounded by piles of talus. It was this type of formation that formed the basis of Captain's Jack Stronghold during the Modoc War. The cracks on the plateau margins and along the tops of the schollendomes were used as a natural defense trench by the Modocs. The Modocs developed them into well-camouflaged sniper positions by piling loose fretworks of rock in and/or around parts of the central crack (Waters 1981:155). At Sheep Rock they served as apparent sheltered campsites.

Soils throughout the study area are variable. They range in depth from non-existent on the exposed edges of the cliffs or ridgetops to thick on the valley floor and include Delaney-Plutos, Lassen-Kunk-Mary, Avis-Shield-Iller, and Lithic Haploxerolls-Lithic Xerothents (Newlun et al. 1983:2).

Climate

Climate within the project area is largely influenced by a typical Mediterranean pattern of warm, dry summers and cool, wet winters. Except for the occasional summer thunderstorms which can occur at the higher elevations, most of the annual precipitation of the region falls during the winter months. Precipitation amounts, however, can and frequently do vary considerably from year to year; ranges of rainfall between 19 inches near the northwestern end of the valley at Yreka to 37 inches along the south end of the valley near Mount Shasta are not uncommon. On the average, 10 days at Yreka and 28 days at Mount Shasta have at least one-inch of snow on the ground, but the number of such days varies greatly from year to year (Newlun et al. 1983:3). Temperatures within the project area vary greatly and are dependent upon elevation, terrain and exposure. The annual average temperature is 68 degrees; however, extremes of 100 degrees Fahrenheit or greater in the summer months to lows of 20 or less degrees Fahrenheit during winter are not uncommon.

Paleoenvironment

Although the region has great potential for palynological work, essentially very little has been done in the Cascade Range and Modoc Plateau area of northeastern California since the initial study of Klamath Lake by Henry P. Hansen in 1942. Hansen is perhaps best known in the field of palynology for the innovative approach that he took in examining the fossil pollen record in the interior Pacific Northwest and northern Great Basin (Mehringer 1985:167). Early on, Hansen saw the potential of palynology for tracing vegetation history as influenced by climatic change and the natural catastrophes that characterize this region. With these data, Hansen, along with his colleagues, was then able to illustrate the importance of climatic fluctuations and their concomitant influences on lakes and marshes to changing human populations (Mehringer 1985:167).

Most pollen profiles date from within the last 12,500 radiocarbon years. However, a few sequences detail Late Wisconsin spread of cold steppe vegetation throughout the region and montane conifers in the Great Basin (Mehringer 1985). With shrinking lakes, wasting glaciers, and catastrophic flooding, pollen profiles indicate initial success of pioneer species as the early Holocene forest expanded toward the north and to higher elevations (Mehringer

1985:167). In areas to the south, relative declines of conifer pollen, and increases of grass and sagebrush pollen signal retreat of montane trees and expanding warm steppe.

While a number of paleoenvironmental reconstructions have been posited for the northern California region, little is currently known about the paleoenvironment of the study area. West (1989) has proposed a general sequence of paleoclimatic changes for the Sacramento River Canyon based on pollen data from Cedar Lake in southwestern Siskiyou County, and several other sampling localities in northern California.

West's 1989 sequence suggests that throughout the region there have been several major shifts in vegetation and climate over the last 10,000 years. Prior to 10,000 BP, at the terminal end of the Pleistocene, conditions were considerably cooler than today (West 1989:48). However, beginning about 10,000 years ago, significant vegetation changes took place as a result of warmer-drier conditions. Although this interval lasted until 3500 BP, the warm-dry pattern was most marked between 9500-7500 years ago (West 1989:49). By about 3500 years ago a cooler, more mesic period began and modern vegetation patterns emerged. Although the climatic optimum appears to have been earlier (e.g., before 7000 BP), this sequence is paralleled in the more southern parts of the North Coast Ranges (Basgall and Hildebrandt 1989:55).

West's hypotheses appear to be supported, in part, by recent work conducted within the Butte Valley region of Siskiyou County, California by King (1995). Shore terraces indicate that an extensive 14 meter deep Butte Valley lake briefly overflowed into the Klamath River Basin at least once during the late Pleistocene (King 1995:53). Moreover, the lack of paleolake shoreline evidence between the 1297 and 1291 meter elevations on the floor of Butte Valley indicates that a rapid desiccation occurred at the end of the Pleistocene for Butte Valley paleolake (King 1995). Vegetation and soil development, coupled with archaeological evidence along the shore areas of Holocene Meiss Lake indicate that for most of the Holocene the lake was below the 1290 meter elevation, the current elevation level, and that it was not dry for any significant periods of time.

Vegetation Patterns

The habitat restrictions for plants throughout the study area are dependent upon a variety of factors such as elevation, slope, slope aspect, soils, and available moisture. These factors function to control not only the density of vegetation, but also determine which species are present in the plant cover. A listing of the various plant species observed within each parcel may be found in Molter (1996).

In the broadest terms, the natural vegetation within the study area can be classified into six types: grassland, brushland, oak woodland, juniper-sage woodland, mixed conifer woodland, and riparian. Within each of these categories, however, there are intergrades and variations in species composition. The principal variation is generally within the percentage of shrubby species present (Newlun et al. 1983:3).

Although a large majority of Shasta Valley was originally native grasslands, heavy grazing pressure and widespread droughts of the 1860s have reduced the extent of native perennial grasses. Perennial grasses such as wheatgrass, fescue and squirreltail are present today. The soils that are shallow or rocky, or both, and are in association with deeper soils, support a brushland type plant community that consists primarily of manzanita and Ceanothus shrubs. Where the soils become more clay-like, such as within the north end of Shasta Valley, the areas then support an oak woodland community of white oaks, Ceanothus shrubs, and both perennial and annual grasses.

The majority of the parcels within the study area, however, support a juniper-sage woodland community which intergrades into a mixed conifer woodland as the elevation increases. Thus, typical trees include western juniper on the foothills, Jeffrey pines at elevations of less than 3,000 feet, and various mixed conifers in addition to Jeffrey pines between 3,000 and 6,000 feet. Also present along the more permanent drainages are zones of riparian vegetation.

Faunal Composition

Major game species known to have existed within the project area include deer (Odocoileus sp.), elk (Cervus canadensis), pronghorn (Antilocapra americana), and mountain sheep (Ovis canadensis). Additional species present in the area include jack rabbit (Lepus californicus), cottontail rabbit (Sylvilagus nutalli), ground squirrel (Spermophilus sp.), wood rats (Neotoma sp.), and coyote (Canis latrans).

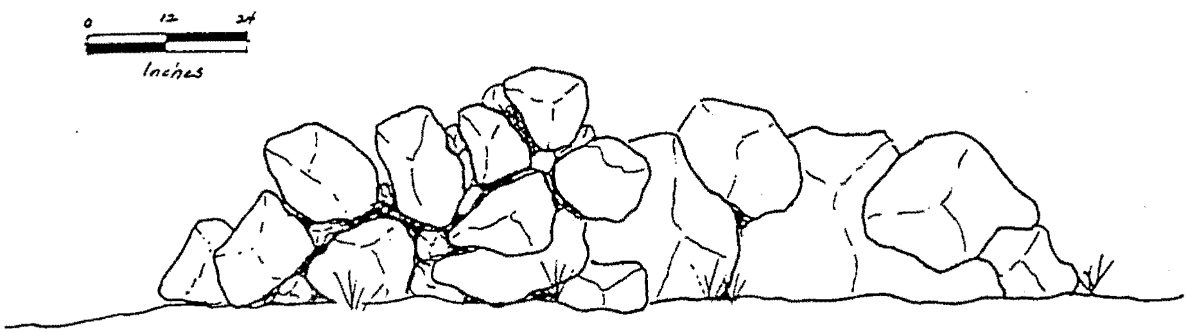
Year-round avian species include the bald eagle, raven, great horned owl, short-eared owl, and sage grouse. Several varieties of fish were also available in the sluggish streams and rivers in Shasta Valley. Wallace and Taylor also noted that though they were not encountered with any great frequency, fresh-water mussels could also be found in these same stream channels (1952:13).

Recent Alterations

The majority of lands within the study area are currently undeveloped due to the relative inaccessibility of many of the steep canyons and rugged mountain slopes. However, there are several dirt roads that pass through the area, as well as other developments related to unsuccessful subdivisions in the vicinity of Sheep Rock. These roads receive primarily light duty use associated with the agricultural activities that are performed within the project area at lower elevations by local ranchers.

The original vegetative pattern of the project area has undergone major alterations since the historic era. While the principal causes of these alterations have been cultivation, overgrazing, and fire, the widespread droughts of the 1860s have reduced the extent of the native perennial grasses (Newlun et al. 1983:3). Originally, Shasta Valley contained open grasslands, but since historic times these open grasslands have since been converted to cropland. It has been estimated that approximately five percent of the more sloping soils around the edges of this valley have also been cleared of grass and shrubs and have been used for dryland crops (Newlun et al. 1983). There is also the likelihood that junipers are a recent invader that will continue their spread onto the valley floor.

The study area has witnessed extensive agricultural use during the historic era and more recent past. In addition to land clearing activities associated with juniper woodcutting, evidence of historical agricultural usage within the lower elevations of the valley can be witnessed by the construction of reservoirs, development of springs, and channelling of water into ditches. Based on the large number of rock walls, corrals, and cattle trails, it is also quite evident that portions of the study area have been put to animal husbandry use during the historic era. Isolated evidence of historic habitation, although limited in quantity, is also evident throughout the study area by the presence of old transmission line corridors and trash scatters.



Typical wall segment from The Long Wall Site (CA-030-704)

CHAPTER 3

CULTURAL CONTEXT AND CHRONOLOGY

As a result of nearly 50 years of archaeological and historical research, a cultural sequence has begun to emerge for central Siskiyou County, California (northern California) which is reflective of over 9,000 years of hunter-gatherer occupation. While recently there has been an increase in both the quantity and quality of archaeological investigations undertaken within this region, substantive and systematic excavations continue to be rare. This chapter describes previous archaeological research and the culture history of the Shasta Valley area and surrounding regions as it is currently understood.

Previous Research and Prehistory

In 1988 Connolly wrote,

> The archaeology of southwest Oregon and adjacent areas of northern California has suffered from the absence of a basic culture-historic framework, making it difficult to place specific archaeological components within a temporal context except by generalizing chronological patterns from outside the region (1988:246).

For the Shasta Valley, Connolly's statement is even more apparent since archaeological investigations here have tended to be few in number and site-specific in nature. Although archaeological fieldwork was initiated as early as the 1950s, to date the majority of the work performed in the valley has focused primarily on cultural resource management clearances. Further, as noted by Nilsson (1988:16), few regional research issues have been advanced or explored owing to the geographical and temporal separation of investigated sites and the degree of archaeological inquiry undertaken at each. Thus, prehistoric reconstructions have relied primarily on extrapolations of data and sequences from nearby contiguous regions. Hence, this archaeological background section will include a brief outline of north-central California prehistory, followed by an outline of Klamath Basin, southwestern Oregon, and Shasta Valley prehistory.

North-Central California

The earliest systematic archaeological investigations within north-central California occurred during the 1940s and primarily concentrated on the major river systems. Prior to their inundation by waters of the Shasta Dam project, a reconnaissance and limited excavation program was carried out by Smith and Weymouth (1952) along Squaw Creek and portions of the Sacramento, McCloud and Pit rivers. These investigations resulted in the discovery of 37 prehistoric sites that were classified as either river, terrace or hill settlements situated along the McCloud River drainage. A comparison of the archaeological material with known cultural elements from Wintu groups that lived in the region resulted in the suggestion by Smith and Weymouth that these sites reflected late prehistoric/protohistoric occupation (1952).

In response to proposed construction of new reservoirs in northern California, archaeological surveys and excavations continued to be performed throughout the 1950s and 1960s. Researchers during this period of time primarily focused on the excavation of cemeteries which date to late prehistoric and protohistoric periods (Basgall and Hildebrandt 1989). The most significant work was carried out by Treganza (1954) and Treganza and Heickson (1969) in Tehama County, and by Dotta (1964), Dotta and Hullinger (1964), and Woolfenden (1970) in Shasta County.

Data recovered during the Shasta Dam investigation, in addition to subsequent research in north-central California (Smith and Weymouth 1952; Treganza 1954), were used by Meighan (1955) to develop a generalized culture historical sequence for the North Coast Ranges. Meighan grouped all late period materials from northwest and north-central California into the Shasta Complex estimated to span post A.D. 1600 to historic contact (cf. Basgall and Hildebrandt 1989). Attributes considered associated with this complex included hopper mortars and pestles, bipointed chert bifaces, Gunther Barbed projectile points, and an overall emphasis on hunting and gathering. Village sites appeared to have favored streamside locations, often producing "mounds" up to five meters in depth that contained a variety of house depressions.

Archaeological investigations within northern California through the 1970s and early 1980s (Foster 1982; Jensen 1977, 1980; Johnson 1976; Johnson and Skjelstad 1974) continued to focus on late period sites, and in 1982 Sundahl undertook a thesis project to document the origin, development, and distribution of the Shasta Complex in the Redding area. Additionally, Clewett and Sundahl (1982, 1983) demonstrated that groups had been occupying the area far longer than had been indicated by the initial archaeological studies in the region. Their investigations, based upon excavations at CA-SHA-475, located in the Squaw Creek drainage, and field-work at three sites along Clikapudi Creek, led to the development of a chronological sequence that identified several cultural complexes (1982, 1983).

The earliest period of occupation in the northern Sacramento Valley region is represented by the Early Archaic (6000 - 3000 B.C.). Villages at this time tended to be small to medium in size and occurred mainly in the foothill zones and along major and minor streams. Projectile points tend to be large and wide-stemmed and most probably were used with atlatls and spears. Manos and metates, which were first used in any frequency during this period, indicate an increased reliance on seeds for subsistence.

The Middle Archaic period (3000 - 500 B.C.) represents the next occupational phase (Theodoratus 1981). Although the settlement patterns remained unchanged, tool kits began to become more elaborate and included small unifacial foliate and bifacial stemmed projectile points and darts. It was during the Transitional period (500 B.C. to A.D. 500) that it is hypothesized that the foothill areas were abandoned for more favorable locations near or on the valley floor along major river drainages (Theodoratus 1981:27). This is an hypothesis that more recent investigations (Tyree 1992) do not support. Medium-sized side- and corner-notched projectile points are characteristic artifact types, as well as the appearance of mortars and pestles.

It was not until the Shasta Complex appeared during Late Archaic times (A.D. 500 to A.D. 1850) that hopper mortars and pestles became the preferred groundstone implements. It was also during this time that the bow and arrow were first introduced (Clewett and Sundahl 1982).

The settlement pattern for the Shasta Complex consisted of the placement of large villages and smaller secondary sites close to favorite food procurement locations (Theodoratus 1981). Economic pursuits relied heavily on acorn gathering, salmon fishing and hunting (Clewett and Sundahl 1982). Sundahl (1982) argues that the full array of Shasta Complex traits was restricted to sites located within the ethnographic territory of the Wintu, arguing further that during this final phase there were two cultural patterns present within the region, one characterized by the Shasta Complex and associated with the Wintu, and the other, known as the Tehama Pattern, associated with Yana occupation (Clewett and Sundahl 1982). Supported by linguistic reconstructions proposed by Whistler (1977), Sundahl (1982) hypothesized that the Shasta Complex represents the archaeological manifestations of Wintu migration into the upper Sacramento Valley in relatively recent times (cf. Basgall and Hildebrandt 1989).

As a result of recent Sacramento River Canyon investigations, three occupational phases have been proposed (Basgall and Hildebrandt 1989) for this locality. Initial occupation within the canyon began approximately 3300 B.C. and lasted to 700 B.C. This phase, termed the Pollard Flat phase, is characterized by the presence of Squaw Creek Contracting Stem, Pollard Diamond-shaped, and McKee series projectile points (Basgall and Hildebrandt 1989:202). Obsidian debitage occurs primarily as small pressure and light percussion debris suggesting that large quantities of glass arrived at the sites in partially reduced form (Basgall and Hildebrandt 1989:428). Obsidian hydration values for Grasshopper Flat glass associated with this phase range from 4.0 to 6.1 microns. Heavier flaked stone implements consisting of spalls and core/cobble tools are rare but apparently important constituents of the Pollard Flat assemblage (Basgall and Hildebrandt 1989:428). Other characteristic artifact forms include millingslabs, handstones, incised stones, stone beads, and pendants.

The second occupation identified in the canyon is designated the Vollmers phase and encompasses the period of approximately 700-2500 B.C. (Basgall and Hildebrandt 1989:202, 428-429). From the standpoint of the broad temporal spread there appears to have been 1800 years of overlap with the Pollard Flat phase, or about 1,200 years of two distinct groups using the more restricted range. Artifacts characteristic of this phase include medium-size, corner- and side-notched projectile points of the Clikapudi Notched series; obsidian flake tools and bifaces, cobble spalls, core/cobble tools, and millingslabs and handstones. Obsidian hydration rim values for Grasshopper Flat obsidian range between 3.0 to 5.5 microns, with most, however, falling between the 3.4 to 5.0 micron range. Obsidian debitage is overwhelmingly represented by small pressure retouch debris, reflecting late-stage reduction and finishing.

The most recent occupation is designated the Mosquito Creek phase which spans the period between 900 B.C. to historic contact (Basgall and Hildebrandt 1989:202, 429-430). It is characterized by Gunther series points throughout its duration, and Desert Side-notched forms toward its later end. Obsidian hydration values for Grasshopper Flat obsidian included all readings less than 3.2 microns. Other characteristic artifacts include mortars and pestles, incised stones, along with the continuation of cobble spalls, millingslabs, and handstones.

Klamath Basin

The Klamath Lakes Basin, which includes Upper Klamath Lake, Klamath Lake Marsh, Lower Klamath Lake, Tule Lake, and Klamath River Canyon, has received the most extensive archaeological research of all regions discussed in this study. Luther S. Cressman's pioneering research during the 1940s provided the first chronological sequence of human occupation in the Klamath Basin region.

The earliest of Cressman's complexes, the Narrows Phase, was thought to be characterized by the presence of lithic tools in association with extinct megafauna (1940:305). Long fossilized bone foreshafts with beveled edges and sharp points, large leaf-shaped and side-notched projectile points, large obsidian knives, and crude scrapers were noted within the artifact assemblages associated with this complex. Cressman assigned the Narrows Phase with its complex of artifacts to the Early Postpluvial period dated between 8000 to 4000 years age (Cressman 1940:305).

Cressman's second complex, the Laird's Bay, was thought to have dated before the Little Pluvial period, from 2000 B.C. to A.D. 1. This complex was characterized by large- and medium-sized side-notched, corner-notched, and leaf-shaped obsidian projectile points, oval manos, and bone awls (Cressman 1940:309). This sequence was later expanded by Heizer's excavation of two caves at Petroglyph Point near the southern shore of Tule Lake to include the Modoc Complex (Heizer 1942:123-127). The Modoc Complex is thought to span a period of time from A.D. 1 up until the historic era and included artifacts such as Pacific coast shell beads and ornaments, modified bird bone, seed beads, twined basketry, cordage, mortar fragments, and small obsidian projectile points.

Subsequent work conducted by Squire and Grosscup (1952, 1954) in the Tule Lake Basin and Lower Klamath Lakes region led to further refinements of Cressman's chronological sequence. Based on excavations at both rockshelter and open-air sites, the assemblages which were identified as Cressman's Modoc Complex were subdivided into three successive phases: Indian Bank, Gillem Bluff, and Tule Lake.

The Indian Bank Phase is thought to date from A.D. 850 to A.D. 1350 and is separated from the succeeding Gillem Bluff Phase on the basis of projectile points types and groundstone technology. The Gillem Bluff Phase, A.D. 1350 to A.D. 1800, is characterized by the presence of large obsidian blades, stone mauls, split mammal bone awls, thin grinding slabs and large- and medium-sized projectile points. The Tule Lake Phase spans the period of time from A.D. 1800 to the historic era and is considered to represent the culture of the late prehistoric and proto-historic Modoc. Projectile points noted include small triangular and side-notched types as well as large obsidian blades. Twined basketry, split mammal bone awls, bone and antler flaking tools; bone, pinenut and shell beads; and hopper mortars also characterize this phase.

Work conducted by Swartz (1961, 1964) around Tule Lake supplemented, and, in part, supported Squier and Grosscup's earlier findings. However, Swartz (1964) did feel justified in dividing Cressman's Laird's Bay Phase into an early and late period that included Squier's Indian Bank Phase. Additionally, although Swartz accepted Squier and Grosscup's Tule Lake Phase, he could find no evidence of the Gillem Bluff Phase within his own data and believed that it was either based on an areal variant of the Laird's Bay Phase, or was, perhaps, an unrepresentative sample (cf. Jensen and Farber 1982:43).

In 1966, Leroy Johnson reported on the archaeological excavations of a large, open prehistoric village site known as Nightfire Island, that was situated on the prehistoric southern shoreline of Lower Klamath Lake (Johnson 1969a; 1969b). Preliminary work at this site by Howe in 1968 revealed an extremely rich cultural deposit that contained a series of geologic strata indicating a continuous occupation over the last 7000 years. Although the first chronological sequence developed for Nightfire Island was based on the interpretation of the site's faunal assemblage by Grayson (1976), subsequent analyses of the artifact assemblage by Sampson (1985) and Hughes (1983) have resulted in 15 identifiable strata which span a time depth of 5500 B.C. to A.D. 1360 (Hughes 1983:121).

The strata were identified using sedimentary deposits, lithic and avifaunal constituents, as well as radiocarbon dates. These strata are grouped into three major stratigraphic zones and include a large flake zone (dated 5500 B.C. to 2450 B.C.) which is defined and correlated on the basis of the physical size of the obsidian debitage; a small flake zone (dated 2450 B.C. to A.D. 250) which is defined on the presence/absence of avifaunal constituents; and a terminal arrowhead zone (dated A.D. 250 to A.D. 1360 $\pm$ 240) which is identified by the presence of Gunther series projectile points above the small flake zone.

Obsidian characterization analyses conducted by Hughes (1983) of the Nightfire Island projectile points revealed some interesting shifts in obsidian procurement patterns through time. It appears that during the earliest time periods (5500 B.C. to A.D. 500), approximately 80 percent of the Northern Side-Notched projectile points were fashioned from obsidians that were derived from nearby sources to the south in the Medicine Lake Highlands, while 14 percent derived from sources located to the northeast (Quartz Mountain, Spodue Mountain and Drews Creek/Butcher Flat) (Hughes 1983: 153-158). The remaining six percent of the

Northern Side-Notched projectile points derived from more distant eastern obsidian sources such as Buck and Blue Mountain.

Hughes interpreted the obsidian distributional data during this period of time as being consistent with what would be anticipated if groups had direct access to the Medicine Lake Highlands sources (Hughes 1983:157). Hughes (1983:157) felt that the few distant northern and eastern sources that were represented in the Northern Side-Notched projectile point assemblage most likely resulted from occasional exchanges with peoples living in these areas, or alternatively, they may have been introduced by in-marrying males from adjacent social groups (Hughes and Bettinger 1984).

From approximately 1350 B.C. to A.D. 250 it appears that quite a different obsidian procurement pattern is represented at Nightfire Island which contrasts sharply from the preceding period. During this period of time there is a dramatic increase in Elko Series projectile points manufactured from the more distant northeastern sources even though approximately 63 percent of the Elko points are still being manufactured from Medicine Lake Highlands' obsidians. While the use of obsidian for the Drews Creek/Butcher Flat geochemical source groups basically remains the same, the use of Spodue Mountain obsidian nearly doubles, and points from other northeastern obsidian sources (Sugar Hill, Coglan Buttes, Silver Lake/Sylvan Marsh) begin to occur within the Elko assemblages. The remaining Elko Series points (11 percent) are manufactured from obsidians located to the east of Nightfire Island (Buck and Blue Mountain). According to Hughes (1983:159), these results appear to be suggestive of broader sociocultural changes occurring within the Lower Klamath Lakes region during this period of time.

Beginning around A.D. 200 to A.D. 300, another shift in obsidian procurement patterns appears to have taken place at Nightfire Island, one that was correlated with the introduction of Gunther Series projectile points. Data obtained by Hughes (1983:156) indicate that, during this period of time, the frequencies of nearby southerly located obsidian sources from the Medicine Lake Highlands groups increase noticeably (18 percent), while the percentage of more distant northeastern materials declines by approximately 15 percent. Hughes (1983:163) states that this shift during Gunther times appeared to be different than those witnessed during the earlier periods and was likely a result of technological differences as well as violent social conflict.

The next major excavation conducted along the northwestern margin of our area of concern is situated on the Klamath River just south of the Oregon border. CA-SIS-332, commonly known as the Iron Gate site, is apparently a small, late prehistoric village dating from approximately A.D. 1400 to 1600 (Leonhardy 1967). Excavation units were selected on the basis of the occurrence of housepits, which resulted in the reconstruction of conical-bark covered pit-houses, atypical of the ethnographic Shasta traits observed along this segment of the Klamath River (cf. Raven 1984:45). Viewing the total artifact assemblage, Leonhardy (1967:40) surmised that Iron Gate is expressive of a culture "transitional between central

California and the Klamath Lake/Columbia Plateau regions," with particular California emphasis detected in house form and the use of hopper mortars.

McGuire (1985) excavated a late prehistoric temporary camp on the northeast shore of Lower Klamath Lake. This site, occupied between A.D. 250 and 1350, was used primarily as a temporary butchering/processing area in the context of both spring chub spawns and winter antelope drives. Additional foraging and gathering of plant, small game and waterfowl resources occurred. Marsh/lake uses appear to contrast sharply with Shasta Valley subsistence practices during all periods.

Within the Klamath Basin region, there is only sporadic evidence that suggests the use of the area prior to 5500 B.C. The Macdoel Site, CA-SIS-342, contains the remains of a temporary prehistoric hunters-gatherers camp that appeared to be situated near the remnant Pleistocene lakeshore of Meiss Lake in Butte Valley (Jensen and Farber 1982). On the basis of large Lake Mohave-like or stemmed series projectile points recovered from the deposit and obsidian hydration analyses, the site deposit was assigned a date of 5500 BC to 8500 BC. Recent unpublished work in Butte Valley by Dr. Ted Goebel of Southern Oregon State College has revealed considerable evidence of early Holocene remains. The first solid evidence for occupation of the Upper Klamath River drainage, however, comes from Stratum I of 35KL21, which contains a small collection of generalized bone tools and a few unifacial flaked tools (Mack 1989:21). This cultural period is provisionally named the Secret Springs Phase and on the basis of radiocarbon dating it is estimated to date from 5500 B.C. to 4500 B.C.

The first well-documented period of occupation within the Upper Klamath River area has been termed the Basin Phase. The Basin Phase dates from 4500 B.C. to 2500 B.C. and is characterized by large-sized projectile points such as Humboldt Concave Base, McKee Uniface, and Northern Side-Notched series. Stone bowls, mullers, mortars, and bone tools are also commonly encountered artifact types (Mack 1989:21). On the basis of data recovered from a number of sites dating to this time period, Mack hypothesizes that the prehistoric peoples were most likely hunter-gatherers who utilized the river terraces on a more-than seasonal basis and practiced a generalized subsistence pattern (1989).

The River Phase (2500 B.C. - 250 B.C.) represents the next occupational period for the Upper Klamath River region (Mack 1989:21). Although settlement patterns remain basically unchanged, tool kits begin to become more elaborate and include specialized bone tools in addition to medium-sized projectile points such as Elko, Gold Hill Leaf, Siskiyou Side-Notched and "Class 28 Series." The "Class 28 Series" points resemble the Clikapudi Corner-Notched points found further south along the upper Sacramento River drainage in northern California (cf. Mack 1989:21; Basgall and Hildebrandt 1989). On the basis of the presence of more sophisticated bone tools which include bone and antler chisels, wedges and barbs for harpoons, it has been suggested that the peoples of this phase appeared to have placed a greater reliance upon the riverine resources.

Succeeding the River Phase, is the Canyon Phase which dates from 250 B.C. to A.D. 1850. Mack (1989:21) divides the Canyon Phase into three subphases: Canyon I (250 B.C. to A.D. 900), Canyon 2 (A.D. 900 to 1500) and Canyon 3 (A.D. 1500 to 1850). Gunther series projectile points characterize all three subphases, with the appearance of Rose Spring series and Desert Side-Notched series points appearing in the later subphases. The dominance of small, narrow-necked projectile points in the assemblages from all three subphases suggests a dependence upon the bow and arrow (Mack 1989:22). It was during the Canyon Phase that specialized mullers associated with wocus processing within the Klamath Basin first appear in the Upper Klamath River region. Other characteristic artifacts include ceramic figurines and Siskiyou Utility Ware vessels, mammal bone beads, *Olivella* shell beads, and bone tools. While Siskiyou Utility Ware is more widespread in Canyon 2 Subphase site assemblages, by Canyon 3 Subphase times, its presence appears to decline.

Although it is quite likely that housepits were utilized by the inhabitants of the Klamath Basin prior to A.D. 900, archaeological evidence indicates that by the Late Prehistoric Period the population of the Upper Klamath River drainage occupied pithouse villages year-round (Mack 1989:23). These villages were usually located on river terraces or on knolls, ridges, or terraces adjacent to major streams, not more than one kilometer from the river (Mack 1989:23). It appears that these large midden sites were situated adjacent to the river in order to exploit riverine resources and serve as fishing camps and fish processing areas, while throughout the uplands small task-specific camps associated with hunting and gathering existed.

Southwestern Oregon

Also directly relevant to the study area is a study conducted by Connolly (1986) for his dissertation. Connolly identified four prehistoric cultural patterns or traditions for southwest Oregon/northern California utilizing data gathered through a comparative analysis of assemblage traits derived from a total of 47 site assemblages. Connolly suggests that these patterns be used as a framework for organizing the current archaeological database for southwest Oregon/northern California (1989:61).

Connolly defines the earliest temporal component in the northern portion of his study area as the Glade Tradition. The Glade Tradition is characterized by foliate and broad-necked projectile points of various forms, edge-faceted cobbles, stone bowls, and hammer and anvil stones (Connolly 1988). This tradition is believed to have originated over 9000 years ago and to have persisted to within the last millennium in some areas. A number of attributes from this tradition, including foliate points and edge-faceted cobbles, suggests a technological link between southwest Oregon assemblages and what has been termed the Willits Pattern in northern California by Hildebrandt and Hayes (1984). Connolly notes that the persistence of the Glade Tradition over many millennium in southwest Oregon parallels the continuity observed in the Borax Lake Pattern of northern California.

Connolly's Group IV sites were distinguished by the predominance of wide-stem projectile points that were classified by their excavators as being representative of the Borax Lake Pattern. The Borax Lake Pattern was initially described by Fredrickson (1973, 1984) as an unusually long-lasting cultural tradition for the North Coast Ranges of California. This tradition has been reported to extend between 8000 and 5000 years before present. It appears that all aspects of this pattern represent small highly mobile bands of people whose annual rounds took them from low elevation river terraces to high elevation ridge tops where they practiced a generalized hunting and gathering subsistence pattern (Clewett and Sundahl 1989:38). Although the temporal and geographical boundaries of this pattern are still being debated (Clewett and Sundahl 1989; Hildebrandt and Hayes 1984), it appears that no indisputable Borax Lake assemblages have yet to be reported for southwest Oregon (Connolly 1989:57).

By approximately 1700 years ago, Connolly notes that several new artifact types begin to appear in the archaeological record. Accompanied by an increase in the number and types of archaeological sites these changes mark the beginning of the Siskiyou Pattern (Connolly 1989:57). Artifacts associated with the Siskiyou Pattern include small, triangular barbed points of the Gunther series, the predominant usage of hopper mortars and metates versus bowl mortars, as well as the evidence of long-distance trade items such as marine shells, obsidian and other exotics (Connolly 1988:254). Connolly notes that the Siskiyou Pattern is also associated with the first documented appearance of nucleated pithouse villages.

As observed by Connolly,

> This change in a broad range of assemblage traits suggests that new influences were impinging on the region. A possible population change at this time fits well with population movements hypothesized for northern California (Whistler 1977) and portions of the northern Great Basin to the immediate east (Aikens 1985). Such changes need not be brought on by wholesale population replacement, however, but by expanded trade relationships (Sampson 1985:514), broader-ranging intermarriage practices, the initiation of the historic slave-raiding pattern (Sampson 1985:465-467, 515), or other social factors (1989:58).

Connolly's Group I sites are distinguished by the presence of artifacts considered diagnostic of the Gunther Pattern on the northern California coast. Radiocarbon dates from these assemblages have been dated to within the last 1100 years.

> Paralleling the development of the Siskiyou Pattern, the Gunther Pattern differed from earlier coastal occupations in the region by increased intensity of occupation, dramatic artistic elaboration, and establishment of long-distance trade as seen by the presence of exotics such as *Dentalium* shells and obsidian (Connolly 1988:257).

Shasta Valley

Closer to the study area, and directly relevant are the excavations performed by Wallace and Taylor (1952) along the eastern edge of the valley in addition to excavations conducted in the valley by Clewett (1968), Ritter (1984), and more recently by Nilsson (1985a, 1985b, 1987, 1988) and her colleagues (Johnston and Nilsson 1983; Nilsson et al. 1989).

The earliest systematic archaeological investigations performed within the ethnographic Shasta territory occurred during 1950 by William J. Wallace and Edith S. Taylor who excavated a small rockshelter along the eastern edge of the valley. Based on the presence of small triangular barbed projectile points, Wallace and Taylor suggested a period of occupation as late as A.D. 1700 to 1800 (Wallace and Taylor 1952:33). Obsidian was the dominant lithic material used for stone tool manufacturing at the site. However, cryptocrystalline silicates and basalt were also present. Site function was attributed to seasonal hunting by Achomawi, Modoc or Eastern Shasta peoples (Wallaçe and Taylor 1952:33).

Excavations at CA-SIS-327, the Chaney Site, were undertaken by S. E. Clewett and California State University, Chico in 1965. Located in southern Shasta Valley along the banks of the Shasta River, the Chaney Site represented a small pithouse village that possessed a cultural assemblage which included projectile points and groundstone implements indicative of a late prehistoric occupation (Clewett 1968). However, a recent analysis of the artifact assemblage from this site by the authors suggests that while projectile points typically assigned to the late prehistoric period dominant the assemblage, there are hints of earlier occupational sequences (e.g., Clikapudi Series projectile points) occurring at the site.

Over the next two decades, archaeological research within the valley reached a hiatus until 1984 when Eric Ritter of the Bureau of Land Management initiated excavations at CA-SIS-266, Sheep Rock Shelter (1989). Unlike the cultural deposit encountered by Wallace and Taylor at CA-SIS-13, Sheep Rock Shelter yielded few archaeological remains despite the presence of a midden deposit. One corner-notched projectile point, two metate fragments, a mountain sheep bone awl and lithic debitage dominated by obsidian material was recovered. Analysis of cultural and ecofactural materials suggested that the site was utilized as a lithic reduction workshop in which the maintenance and final shaping of tools was occurring along with local foraging for seeds and other plant foods and hunting. Radiocarbon dates and obsidian hydration rim readings obtained on cultural material indicate that the site was occupied between 600 B.C. to A.D. 700 (Ritter 1989:42).

The most recent work in Shasta territory has been that conducted by Nilsson during the mid to late 1980s in the northern portion of the valley near Ager. Conducted in response to realignment of the Montague-Ager Road, a series of eight prehistoric sites was investigated by Mountain Anthropological Research (MAR) on behalf of Siskiyou County Department of Public Works (Nilsson 1991:3). CA-SIS-1088 along the Little Shasta River was occupied between about 3000 B.C. and A.D. 1200 in two periods with lithic reduction largely related to mobile hunting/gathering activities in transitional zones. Nilsson remarked that four of these sites, three sparse, surface lithic scatters and a housepit village that underwent minimal testing, yielded little in the way of archaeological data (1985b, 1991). However, archaeological investigations conducted at the remaining sites (CA-SIS-900, CA-SIS-154, CA-SIS-331, CA-SIS-332) in addition to a re-examination of the data from previously excavated rockshelters (CA-SIS-13 and CA-SIS-266) provided a significant body of data that allowed Nilsson to develop a provisional chronological sequence for the Shasta Valley area.

The earliest distinct cultural manifestations in Shasta Valley proper that can be solidly documented is the Ager Phase which Nilsson (1991:4) identified with the period from 500 B.C. to A.D. 500. The artifact assemblage associated with this phase is characterized by Elko Corner-Notched, medium-sized side-notched and stemmed leaf-shaped projectile points manufactured nearly exclusively of Grasshopper Flat obsidians. Unifacial and bifacial manos, unifacial metates, end scrapers, and side-scrapers are also characteristic artifacts of this phase. Lithic technology during this period of time appeared to focus on the reduction of imported, preformed obsidian bifaces. However, core reduction of local cryptocrystalline and basalt materials was commonly encountered (Nilsson 1991). Faunal remains indicate that dietary patterns focused primarily on large and small terrestrial mammal species including various artiodactylidae and leporidae. Settlement pattern information, although quite limited, appears to suggest that in addition to occupying river banks at the transition zone between the valley bottom and the upland region, the adjacent upland areas were utilized at least on a sporadic basis during this period of time (Nilsson 1991).

Succeeding the Ager Phase, is the Meek Phase, which Nilsson dated to the period from A.D. 500 to historic contact. According to Nilsson, the characteristics of this phase include a highly diversified artifact assemblage that includes a wide spectrum of signature tools (Nilsson 1991:7). Projectile point types of the Meek Phase are dominated by Gunther Barbed series specimens as well as a limited number of Desert Side-Notched series and other small corner-notched specimens. The groundstone assemblage is similar to that of the preceding complex except for the appearance of flat-ended and cylindrical pestles and, more rarely, hopper mortars (Nilsson 1991:7). Various bone tools and ornaments, shell beads, twined basketry, ceramic figurines, and pottery fragments identified as Siskiyou Utility Ware are also commonly found in site assemblages during this period of time.

Nilsson (1991:7) notes that lithic technology patterns typical of Meek Phase assemblages revolve around a reduction strategy which was multi-facetted and material specific, and included core, biface, and bipolar techniques. Of note, is the apparent increase in the number of obsidian sources utilized during the Meek Phase. Whereas assemblages associated with the Ager Phase are dominated by a near exclusive use of obsidian from Grasshopper Flat, site assemblages associated with the Meek Phase reveal the presence of four additional Medicine Lake Highland glasses. In addition to the continual use of Grasshopper Flat obsidians, Cougar Butte, Callahan, Glass Mountain, and Railroad Grade obsidians were also represented in these site collections, albeit in limited numbers (Nilsson 1991).

Subsistence data from Meek Phase site assemblages suggest a continued focus on terrestrial mammal species. However, evidence for the exploitation of riverine resources begins to appear during this time period. Based on these data, coupled with the lack of fish bone and freshwater mollusk from Ager Phase site assemblages, Nilsson hypothesizes that shifts in subsistence patterns may have occurred during the Meek Phase as riverine resources began to be exploited and the reliance on land animals was lessened in favor of a broader-based economy (1991).

The primary purpose of presenting the information above has been to provide an outline of the prehistory beginning around 10,000 years ago and extending to protohistoric times for the southern Klamath Basin and contiguous areas such as Plateau and north-central California. Based on the proximity of Shasta Valley to these adjacent areas, as well as the presence of somewhat similar environmental and ecological conditions, the prehistoric sequences of events and/or materials within the Klamath Basin and north-central California might be basically duplicated within Shasta Valley, or at least there is a comparative data set from which we can look for similarities and differences. Thus, by understanding the hypothesized events which occurred within these contiguous areas, Shasta Valley prehistory and lifeways could begin to be reconstructed and the interpretation of recovered archaeological materials could be aided. Table 1 summarizes the sequences discussed within this report considered to be representative of each region and temporal period.

Ethnographic Period

The identity of the late period occupants of the Shasta Valley area is of current interest to Native American Indians. During the course of consultations concurrent with this project, representatives of the Shasta groups reiterated that their party maintained a personal interest in the cultural resources of the study area (Mary Carpelan, personal communication 1995). Dino Herrera of the Klamath/Modoc tribe emphasized to us the changing cultural boundaries and interactions of his tribe with the Shasta and Shasta Valley, at least on the east side. With these concerns in mind, our primary goal is to present the current understanding of the ethnographic situation with an appreciation of the issues and problems.

Although ethnographic and historical literature clearly place Shasta Valley proper within the territorial boundaries ascribed to the Shasta Indians at historic contact, the foothills and adjacent mountains along the eastern side of the valley provide a more perplexing picture. First, the aboriginal concept of territorial boundaries differed from those of Western ethnographers. As observed by Nilsson (1985a:37), the aboriginal group's concept of tribal boundaries evolved around the exploitation of a certain geographic area for yearly, and often seasonal resource procurement whereas the Euroamericans construct physical demarcation of territorial limits. Thus, being based on environmental criteria, Native American tribal boundaries could, and likely did change through time by either expanding or contracting in relation to the resource being procured (see above comments) (Nilsson 1985a:37).

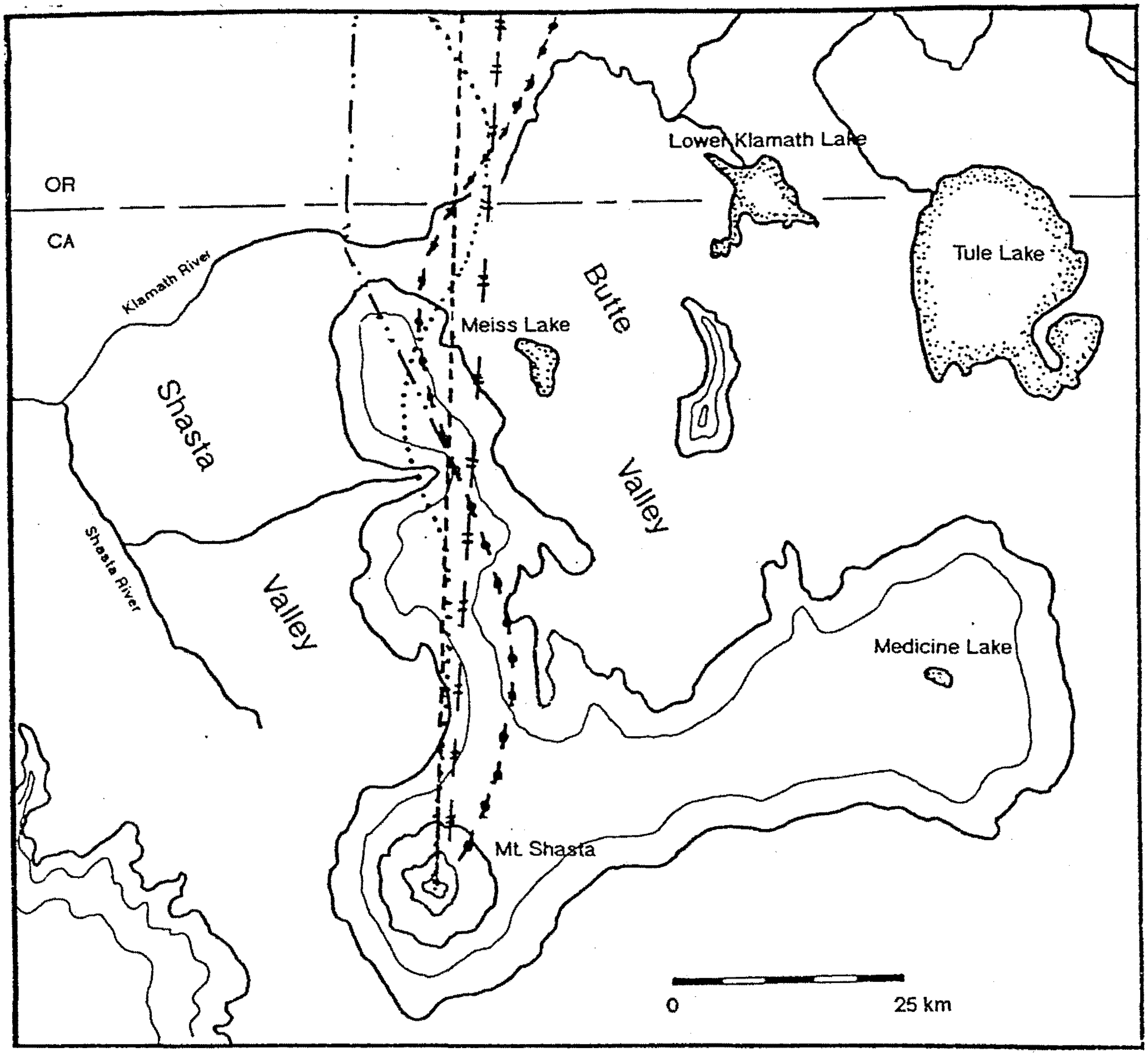
Table 1: Cultural Chronological Sequences Established for the

	Sacramento River Canyon Basgall and Hildebrandt 1989	Squaw Creek Clewett and Sundahl 1983	Night Fire Island Sampson 1983; Hughes 1983	Lower Klam Cressmar
A.D.1850				
A.D.1500				
A.D.1350	Mosquito Creek	Shasta Complex		
A.D.850			Terminal Arrowhead Zone	Lower Kl Lake Late Mo
A.D.350		Transitional Period		
A.D.1	Vollmers			
500 B.C.			Small Flake Zone	
1000 B.C				
2000 B.C.	Pollard Flat	Middle Archaic		Laird's
3000 B.C.				
4000 B.C.				
5000 B.C.			Large Flake Zone	
6000 B.C.		Early Archaic		
7000 B.C.				Narrov
8000 B.C.				

Another factor which undoubtedly affected the interpretation of aboriginal tribal boundaries is that at the time that the earliest ethnographers and historians were recording traditional Native American Indian lifeways and delineating tribal boundaries on maps, Native American Indians were in a state of cultural upheaval and transformation (Jensen and Farber 1982:21). During this era, contact between Euroamerican and aboriginal groups and the subsequent altercations which ensued resulted in an alteration of the traditional homelands of the native peoples. The size, configuration and extent of the original tribal territories of all native groups were greatly altered, with whole nations vanishing from their traditional lands. This era also witnessed the assimilation of surviving Native American Indians into Euroamerican society, or onto reservation lands, that often resulted in the incorporation of several Native American Indian groups into one entity, further obscuring the perceptions and recollections of their traditional lifeways (Nilsson 1985a:38).

Third, and perhaps most importantly, is a consideration of the intensity of use by aboriginal groups of environmentally diverse segments of their territories. Both the Shasta and the Modoc claimed what can be referred to as nuclear territories and peripheral exploitation zones that were used during their seasonal or yearly rounds (Nilsson 1985a). Whereas a hunter-gatherer's nuclear territory consisted of those areas which could be exploited on a yearly basis in addition to areas in which permanent settlements were located, the peripheral exploitation zones, or procurement ranges, by definition are areas used by a hunter-gatherer group and/or any individuals within the group for the procurement of food or non-food resources (Shackley 1990:61). Therefore, by definition this procurement range is a larger area and includes both the hunter-gatherer's nuclear territory - that piece of space that a hunter-gatherer group lays claim to - and exploration ranges - individual ranges which may include areas not covered by the majority of the group for whatever reasons. Hence, it is within these procurement ranges that the greatest implications for exchange and group interaction arise as well as the cause of many discrepancies in the literature concerning tribal boundaries. For example, Merriam writes (1926:24) that the Shasta, Wintun, Modoc and Achomawi all collected obsidian at Glass Mountain, and that the latter two both claimed to own it outright. Clearly, Glass Mountain lies outside the nuclear territory of both groups, as nuclear territory is defined above; however, it is within the peripheral exploitation zone of both. While the Modoc would not question the Achomawi ownership of the Pit River valley and the Achomawi would not dispute Modoc ownership of Lower Klamath Lake, ownership of the intervening area was less sharply defined in the minds and customs of the Indians (cf. Jensen and Farber 1982:22).

It has been generally agreed by most ethnographers that the Modoc nuclear territory consists of the Lower Klamath, Clear and Tule Lake basins in addition to including the headwaters of Lost River and stretches of Sprague River (Figure 3) (Kroeber 1925:318; Murray 1959:8). Barrett (1910:240-241) placed the westernmost boundary of the Modoc at the divide between the Klamath River and the Klamath Lake watershed. If Barrett's reference were taken literally, this would mean that the Modoc and Klamath owned the Klamath Basin proper. However, the mountains to the west would be outside of their territory. In a similar



SHASTA/MODOC TERRITORIAL BOUNDARY INTERPRETATIONS

Dixon (1907)

Silver (1978)

Heizer and Hester (1970)

Ray (1963)

Curtis (1924)

Figure 3: Ethnographic Tribal Boundaries

manner, Kroeber (1925:318) and Powers (1976:252) both placed the Modoc western boundary at Butte Creek where they would come to dig epos and camas roots during the summer months. This boundary clearly excludes Shasta Valley from Modoc territory. However, Merrill (1957:9-10) states that the Modoc summer camps were situated at Sam's Neck on the western fringes of Butte Valley. Based on the accounts provided by these early ethnographers it would appear that the western boundary of Modoc *nuclear* territory falls to the east of Butte Valley. However, this region as well as the intervening mountain range along the eastern edge of Shasta Valley was considered to be part of the Modoc *procurement* range which was visited during the summer months for various seasonal resources.

The eastern boundary of the Shasta nuclear territory has been placed by both Kroeber (1925:282) and Silver (1978:211) at an approximate north - south line connecting the towns of Beswick and Mount Shasta. Al Lyons, a Shasta Indian informant interviewed by Jensen and Farber (1982:23-24), stated that the eastern boundary of Shasta tribal territory was at Topsy Grade, a ridge located a few miles east of Beswick that overlooks Butte Valley. Moreover, it seems likely that pressure on the Shasta brought about by Euroamerican presence in and around their nuclear territory, and particularly from the severe damage to salmon fishing caused by mining, induced the Shasta to attempt to secure lands outside their homeland territories for exploitation in order to compensate for the destruction of their traditional resource base (cf. Jensen and Farber 1982).

It should be clear from these details that it is likely that the moutains of the Cascade Range most likely functioned as a peripheral zone in which the exploitable resources were shared by both the Shasta and Modoc groups at various past times. Undoubtedly, the Euroamerican intrusion into the area during the mid 1800s resulted in dramatic changes in the native patterns of interaction. Apparently, not only did at least two linguistically unrelated, culturally diverse groups coexist within portions of the study area, but the material culture that they may have introduced into the record is likely to have had widely separated origins further complicating the archaeological record of the region. In terms of understanding the role in which the study area served in aboriginal ecosystems, the area appears to have been attractive to groups centered in such diverse settings as the northern Cascades, Modoc Plateau and Klamath Basin. Since subsistence strategies associated with each of these areas was likely to have been distinct, it is equally likely that the various groups which visited the region had functionally different reasons for exploiting the resources within the area.

The following ethnography is based on data gathered prior to 1910 based on the surviving elders memory culture as well as early settlers accounts. Detailed ethnographic descriptions for the Modoc area are given by Powers (1976), Barrett (1910), Kroeber (1925), Spier (1930), Stern (1964) and Ray (1963). The Shasta have been described by Dixon (1907), Kroeber (1925), Voegelin (1942), Holt (1946), and later synthesized by Silver (1978).

As with many other California groups, the basic subsistence strategy of the Shasta was that of seasonal transhumance, where movements from one ecological zone to another was carried out on a seasonal rotation. The object of this strategy was to be at the particular resource during its peak of productivity for the ease of procurement; therefore, a series of base camps among or adjacent to the desired resource was necessary for the success of this strategy. Accordingly, this round of subsistence activities resulted in the location of permanent villages being situated along the river banks and valley edges during winter months where water, vegetation, and game were relatively abundant. In their compilation of Shasta settlements, Heizer and Hester (1970) list three villages within and/or in close proximity to parcels within the study area. *Kwit'sahts-sah'-wish*, located at a spring just north of Sheep Rock is the southeastern most known Shasta village site within the study area while *Ar-rah'-hah-rah'-chi'-ko-kut'-ted'-de-kwah* and *Irutatiru* are both situated along the banks of the Little Shasta River within close proximity to the northernmost portions of the study area. Moreover, Sheep Rock vicinity is reported by Shasta consultants to have been much used for temporary camps (Mary Carpelan, personal communication 1995). The Shasta hunted and gathered such plant materials as epos in the general vicinity (Theodoratus Cultural Research, Inc. 1985).

Upon the arrival of spring, the Shasta moved their residence from the permanent winter houses to seasonal brush huts located along the river banks for a period of intense fishing during the spring salmon run. In addition to anadromous species, suckers, eels, crayfish, turtles, and mussels were also taken (Silver 1978:216). Fish were procured using nets, arrows, spears, weirs, hook and line, as well as being physically driven into traps (Dixon 1907:428). Brackenridge, camping along the Shasta River, was clearly impressed by the craftsmanship and accuracy of Shasta archers. Interestingly, he notes that their "well made" bows were used "with great dexterity, particularly in shooting fish" (cf. LaLande 1989:103).

Hunting resumed on a larger scale throughout the spring and summer months with the acquisition of deer being a primary emphasis. Other game animals that were eaten included bear, elk, antelope, Rocky Mountain sheep, rabbits, beaver, otter, in addition to various small mammals. Hunting methods varied and included tracking game, driving it into enclosures, smoking out (bear, rodents), and using pitfalls, deadfalls, and basket traps for birds (Silver 1978:216).

In addition to hunting and fishing, a wide variety of plant foods was collected by the women. The more significant spring and summer berries included wild currants, spiderbush berries, wild grapes, chokecherries, blackberries, elderberries, serviceberries, thimbleberries, gooseberries, manzanita and madrone berries. A number of greens was also eaten either dried or fresh, including wild celery, wild parsley and wild rhubarb. Principal edible roots consisted of epos, redbells, brodiaea and tiger lily bulbs.

The fall run of salmon began in late August and it was at this time that attention was turned once again toward fishing. Salmon procured at this time were dried and stored for winter use. Following the fall salmon run, acorns began to ripen and procurement activities centered then on collecting and processing this resource. During this time, the Shasta moved from the valley into the hills, occupying small bark houses within the oak groves. Further testimony of the Shasta transhumance pattern associated with fall acorn gathering activities is indicated by Edwards' comment about "vacant villages and very few natives encountered in the Shasta Valley during September" (cf. LaLande 1989:106). Acorns from the black oak, white oak and canyon live oak were gathered; however, tan oak acorns, being the preferred species that was non-local, were obtained by trade with other groups farther down the Klamath River in Karuk, Yurok, and Hupa territories. Other nut species that were gathered during this time included hazelnuts and nuts from the gray, ponderosa, and sugar pine. With the approach of winter, the Shasta returned to their permanent villages along the major river banks and valley edges.

Throughout the Shasta territory cylindrical pestles, hopper mortars, manos and metates were the principal grinding implements. Bowl mortars apparently were not used among the Shasta since they were considered mysterious objects never to be touched except by shamans (Dixon 1907:393). Sinew backed wooden bows were manufactured with arrows painted to match the bows. Foreshaft arrows with obsidian points were used for hunting large game, while headless single-shaft arrows with wooden and/or bone points were used for stunning birds and smaller game.

Although the Shasta relied heavily on imported baskets, they also made a variety of their own using closework and openwork twining techniques. Imported shell was primarily used for ornamentation and currency. Bone and antler were used for scrapers, awls, wedges, arrow shafts and salmon gigs (Silver 1978:217). While canoes were rarely used by the Shasta, those that were employed were imported from the Karuk or Yurok; more common was the use of rafts. In the Shasta River, immediately south of the Klamath River, members of the U.S. Exploring Expedition witnessed "large bundles of rushes, made up in the form of a lashed-up hammock, which the Indians .... use instead of canoes" (cf. LaLande 1989:105).

In comparison with that of the Shasta, the settlement/subsistence pattern of the Modoc more closely resembled the "central based wandering" pattern defined for the Northern Paiute and other western Great Basin peoples (Weide 1974). In place of the acorn, the epos root, available from meadow/sagebrush environments, wokas root and seeds, available from lacustrine environments, and the camas, collected in wet lowland meadows were the principal plant staples (Baumhoff 1978:19-20).

The Modoc subsistence practices were primarily based on a lacustrine adaptation that was characterized by the exploitation of fish, waterfowl, aquatic plants, in addition to the roots and grasses of the sagebrush shrub/open grasslands adjacent to the marshes. They favored lacustrine environments during the winter months and ranged into the shrub grassland, juniper woodlands and meadow/marshlands during warmer months. Permanent winter villages were maintained in the Tule Lake/Lower Klamath Lake basins, along Lost River, and near Clear Lake. These pithouse settlements were located in the vicinity of numerous resources, such as waterfowl, game, and fish. With the coming of spring, seasonal food resources became available throughout their territory, and groups would disperse to seasonal and temporary camps in order to exploit the available resources. Beginning in March and continuing until September, a series of vegetal staples became available, including desert parsley, epos, camas, miscellaneous roots, wokas, berries, seeds, and nuts. Since many of these staples could be ground and/or dried, they were collected in large quantities, processed and stored for winter consumption. During the late summer and throughout fall, antelope, deer, and elk were hunted from temporary camps and strategically placed hunting blinds in the juniper - sage flats of eastern Siskiyou County. It was during this time of the year that wandering Modoc groups might have found their way into the study area. Although many other larger and small game animals were hunted throughout the year, mountain sheep were hunted only in late summer (Ray 1963).

Modoc technology incorporated a diverse assortment of natural materials obtained both locally and in trade. Flaked stone tools were fashioned primarily from locally occurring obsidians. However, basalt and cryptocrystalline silicates were also utilized. Hardesty and Fox (1974:49-51) discuss the ethnographic and archaeological evidence for Modoc initiation of an obsidian-trade network that was focused on the Glass Mountain obsidian quarry. They suggest that prior to the intrusion of the Modoc, Glass Mountain obsidian was exploited by several aboriginal groups. However, following the initiation of the obsidian trade by the Modoc, direct procurement of this source material would have become unnecessary.

Undoubtedly, with the arrival of the white emigrants, drastic changes in the native lifestyles occurred. In a few short years, the natural vegetation and other food habitats of the land had been altered to such an extent that traditional means of subsistence were no longer viable for the native populations living in the area. Depredations, diseases, resettlement and other factors dramatically and rapidly restructured the Shasta and Modoc nations shortly after contact.

Historic Context

The first Euroamericans to enter the region appear to have been a company of Hudson Bay trappers and traders led by Peter Skene Ogden during the winter of 1826 - 1827 (LaLande 1983). Although it is not mentioned in Ogden's journal, there is some indication that at least some of these early trappers used the Military Pass - Sheep Rock Trail (Hoover et al. 1966). Continuing throughout the following two decades, trappers associated with the Hudson's Bay Company were quite active within Shasta tribal territory. Alexander McLeod and his party of trappers are reported to have traveled through Shasta Valley in 1828-1830 where they established camps on the McCloud and Klamath rivers (Dillon 1975:122). Following McLeod, Hudson's Bay Company trappers under John Work used the same route and camps to stage expeditions in the Shasta, Scott and Butte Valley areas of Siskiyou County. At least one of these early camps is situated directly adjacent to the boundaries of the study area. This camp is located near the western base of Sheep Rock at a large spring and is reported to have served as an overnight stop for John Work's party between September 7 - 8, 1833 (Maloney 1945).

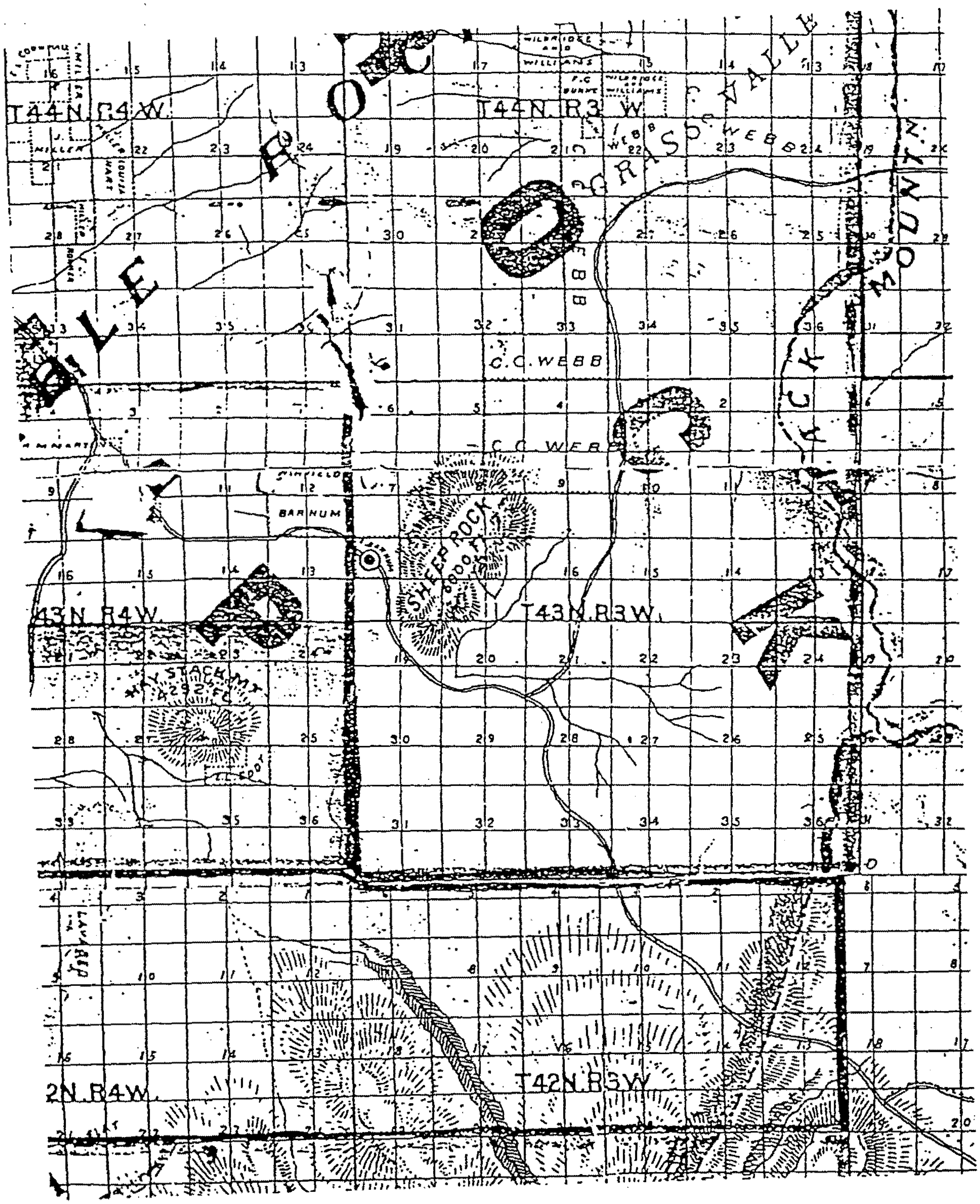
The fact that Sheep Rock served as such a prominent landmark since before the beginning of written records began should come as no surprise. In a land of gray sagebrush and sand, the craggy summit of this mountain rises more than 2000 feet above the valley floor (Muir 1918). The rock served as one of the chief winter pastures of the wild mountain sheep which came down from Mount Shasta. Unfortunately, as a result of intense hunting pressure during the historic era, what few animals remained were killed off during an unusually severe winter in 1888.

Until the mid 1840s when the fur trade industry began to subside, Hudson's Bay Company trappers and traders continued to explore the mountains, foothills and valleys throughout northern California. One end result of these early explorations was the development of various overland routes, several of which passed either directly through or adjacent to Shasta Valley. During the 1840s, the central California-Oregon Trail was initiated through Shasta Valley and by the 1850s it had become a well-established wagon road. The route traversed northern Shasta Valley following the general alignment of the present day Hornbrook-Ager road (Figure 4).

In 1846, the Applegate Trail provided the first regular crossing of the Klamath River near the mouth of Spencer Creek for emigrants coming from the Missouri River. The Yreka Trail was established in 1851 from a branch of the Applegate Trail just west of the divide between Willow Creek and Laird's Landing on Lower Klamath Lake. From Lower Klamath Lake, the Applegate Trail continued on north-west to finally enter the Rouge River Valley near Ashland, Oregon, but those people headed for Yreka turned and went south towards Butte Valley (Arnold 1995:2). Turning southward, the Yreka Trail followed Willow Creek drainage for approximately four miles past Mt. Dome into the Red Rock Valley where it continued west. From this point, the Yreka Trail continued southwest through the Orr Lake Gap and passed along the northern shores of Grass Lake and around the south base of Sheep Rock (Silva 1995).

It was at this point that the Yreka Trail intersected with the Military Pass Road. Military Pass Road began as an Indian trail that was later used by Hudson's Bay Company trappers. Emigrants using this route constructed the wagon road in 1856. By 1857, the military began accompanying the wagon trains in order to protect them from the Modocs; hence, this section of trail became known as the Military Pass Road (Luecke 1982).

From its intersection with the Military Pass Road, the Yreka Trail took a northwesterly course past Barnum Springs toward what was known as the "old Snelling place" (also Herd Ranch and later Coonrod Ranch) to divide somewhere near the present day Harry Cash Road. At this point, one branch of the trail led to Little Shasta where it became known as the Fork of the Little Shasta Trail and the other branch continued on to Yreka (Silva 1995).
It was also near this location that the Pitts River Road intersected with the Yreka Trail.



Portion of Davidson's 1887 Official Map of Siskiyou County showing Sheep Rock vicinity

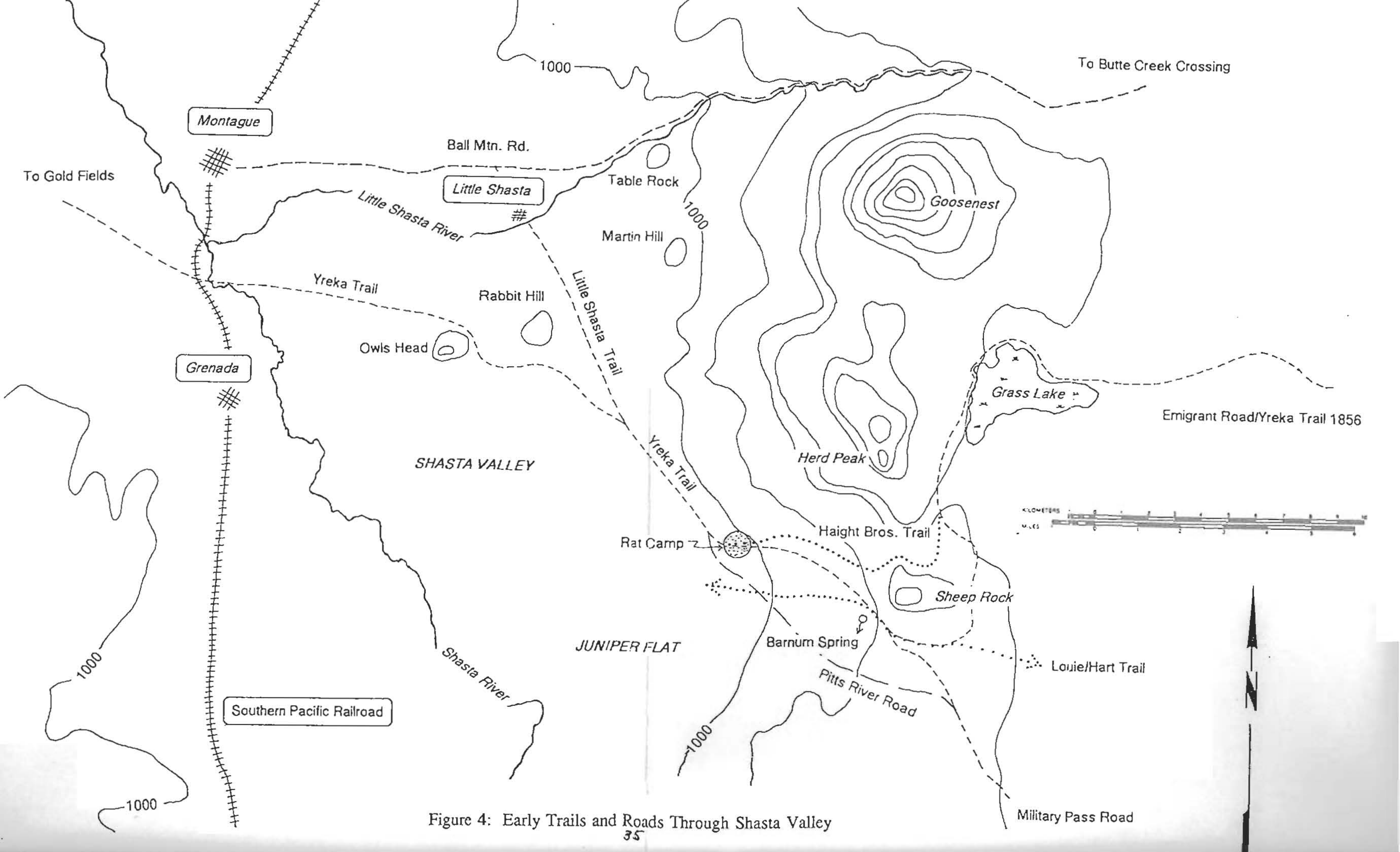


Figure 4: Early Trails and Roads Through Shasta Valley

The Yreka Trail, measuring approximately 73 miles in length, was in use for no more than 10 or 12 years (Silva 1995). By the 1860s, new, shorter routes were being developed to Yreka, ones that bypassed the dangers of Modoc raiding parties around Tule Lake which had plagued the trail since its inception.

Even with these access roads, because of its geographical isolation, the study area remained essentially unknown and unexplored until the lure of gold drew eager hordes of adventurers into the far reaches of Siskiyou County. In the spring of 1851, gold was discovered at Yreka Flat, an area located in the extreme northwest corner of the valley. Immediately, there was a rush to the new diggings, and a considerable town sprang up around the find. A number of these early settlers, however, took up claims in Shasta and Little Shasta valleys in order to work as farmers and ranchers so that they could provide food and other supplies to the miners (Wells 1881:192).

Beginning in 1856 extensive Government Land Surveys were made in Shasta Valley by C. C. Tracy. Tracy's surveys were later updated in 1880 by M. F. Reilly. Following Tracy's original survey, many of these early settlers began to substantiate their land claims by acquiring sizeable land holdings through patents and grants from the U. S. government. The patents primarily included Cash Entry and Homestead Entry patents of approximately 160 or more acres. There are, however, some Culture Timber patents noted for the higher elevations of the study area (e.g., T43N, R4W, portion of Section 18) as well as Stockraising Homestead Entry patents (e.g., T44N, R4W, Section 26). The majority of these patents occurred between the years 1870 and 1898, with another flurry of activity occurring between 1904 and 1917. Generally speaking, the earliest patents appeared to have occurred within the valley proper or along the foothill - valley margin near Juniper Flat in southern Shasta Valley as well as within Little Shasta Valley to the north. Some of the more prominent early settlers who acquired these parcels included R. M. Martin, C. Haight, A. Soule, J. B. Rohrer, G. De Long, E. Barnum and P. S. Terwilliger. Many of the farms and ranches in the area are still owned by the descendants of the original families.

Although the majority of land situated within the valley bottom was used for agricultural purposes, the lands along the foothills and crossing over the mountains to the east included several historic trails that were used to lead cattle and sheep to their summer range. At least three of these early trails were known to exist within and/or adjacent to the study boundaries. The northernmost of these trails roughly followed what is known as the Old Ball Mountain Road. Early surveyor notes indicate that this road has been in existence since prior to 1863 where it served as the northern transportation route from Shasta Valley to Butte Valley drainage. As noted by A. M. Jones on May 8, 1864,

> Plat and field notes of a waggon road Survey commencing at the old sawmill on Little Shasta River and terminating at a large ded pine tree in Bute creek valley, four miles above Ball's cabbin, one and a half miles west of Bute creek and six miles west of the emigrant Road leading to the Klamath Lakes. The entire distance by the survey is twenty and a half miles, on a strate line from

> point to point is fifteen and three fourths miles. The grade is easy and natural. The ground is generally good, though some is inclined to be sandy; but neither in sufficient quantity to prove an obstacle to the construction of a good wagon road (cf. Helfrich 1949:5).

The Haight Brothers Road, also known as Martin's Trail and/or Charlie Haight Cattle Trail was a historic cattle route that led herds over the north side of Sheep Rock to the summer range at Tennant and later Grass Lake. Although this trail may have had some improvements done to it with a Fresno by Charles Haight in the 1800s, it has apparently always functioned as a cattle trail (Silva 1995). A second trail was used by Frank Mills, the Louies and Harts who ran cattle around the south end of Sheep Rock, crossing Hwy 97 on their way to Butte Creek. Both of these early stock trails crossed what was then open country through Shasta Valley where they came up to the base of Sheep Rock near O'Neil Flat.

In addition to cattle, sheep raising was a major activity in the valley during the early 1900s. Jim Martin, along with his partners H. H. Hudson and Milt Martin, owned five bands of sheep containing 5,000 ewes to apparently further the World War I effort (cf. Crebbin 1988). The summer range of the sheep was the summit of the Cascade Mountains from Mount Shasta to the Klamath River in the vicinity of the Klamath Hot Springs while the winter range was in Shasta Valley. The sheep were lambed near Snowden, Steamboat Mountain and Sheep Rock. It was at the Sheep Rock camp near O'Neil Flat that Bob Martin in the 1920s maintained a sheep camp there that was known as "Rat Camp."

> They would keep their sheep there at different times of the year. There was an old cabin there, the sheep herders didn't have a tent, and when they were headquartered there, they'd use the cabin. Of course, the cabin was vacated throughout the year, except during winter time when they were there. The rats would get in the cabin, so we just called it the Rat Camp, and we just carried it on (Brice Martin, personal communication 1995).

It was perhaps as a direct result of these early livestock herding activities that many of the stone fences found throughout the foothills overlooking Shasta Valley were originally constructed. While it is conceivable that the reason for these stone fences being constructed in the valley proper lies with the obvious need to clear some of the rocks off the land in order to plant crops, the need for fences within the foothills and more mountainous regions is not so readily apparent.

The most common type of stone fence is one which is thick at the base and tapers very little towards the top so that the entire width from top to bottom is nearly equal. This type of fence generally measures five feet tall and is three to four feet wide. Many of the rocks utilized in its construction are too large for one man to transport, so it can be assumed that in at least some instances a crew of several men were used.

According to local residents, the majority of fence builders in the Shasta Valley area were of Portuguese descent. Apparently Portuguese sheepherders built rock fences in the Sheep Rock area to pass the time while tending their flocks (Van Camp 1984). August Louie and Joe Rose, both of Portuguese descent, were known to have been involved in fence building in Shasta Valley during the 1860s.

> We worked at the Coonrod Ranch in 1860 or 1861 building many rock and rail fences. The going wage for building rock fences was 25 cents a rod; we build up to four rods a day. A rod is 16 1/2 feet. This works out to be 50 cents each for a day of hard fence building (cf. Van Camp 1984:111).

As noted by Van Camp, the stone fences did not always follow a straight line. It appears that rather than carry the rocks to the fence, the fence was built through areas of heaviest rock concentrations; hence the wandering pattern of the fences seems to have evolved naturally (Van Camp 1984).

Other historic features that are commonly encountered throughout the study area include communication lines, water diversion ditches, and various features associated with historic logging. One of the main communication routes into the Shasta Valley extended through the gap between Sheep Rock and Miller Mountain in Section 6. Evidence of this line can still be found today in the canyon. Moreover, while it was not uncommon for these early settlers to use juniper as their primary source for wooden posts, there were several sawmills located along Little Shasta River northeast of Table Rock along the Ball Mountain Road.

Located at the northern end of the valley was the town of Tailholt. In 1880, Will Cleland constructed a large general merchandise store at the corner where the Upper Little Shasta-Ball Mountain Road intersects the Hovey Gulch Road. Soon after, the area boasted a grist mill, stable, slaughterhouse, butcher shop, blacksmith shop, boarding house, baseball diamond, race track, and rodeo grounds in addition to several dwellings. The new settlement was originally known as "The Corner." However, at some time it was nicknamed "Tailholt." One of the theories regarding the naming of this early settlement states that it may have originated with the cowboys who performed at the rodeos held there.

> Seasoned wranglers, used to roping, bronc busting and branding, used the term "tailhold" when branding a calf out on the open range. A roper would "pile his twine" over the calf's neck and manueuver him over to the branding fire. A second roper would "drop his twine" over the rump, and the rope would slip down and around the hind legs. The tailholder would grab ahold of the tail and tip the calf over on its side, holding it with one knee on the ground, so it could be branded (cf. Riley 1988:56).

Another theory is that with the racetrack across the road, the name came from grabbing hold of the racehorse's tail. Regardless of which theory is the correct one, the town of Tailholt began to decline in the late 1890s following the fire at the grist mill. Now all that remains of this bustling little town is an open field and an isolated roadside monument.

When the Southern Pacific Railroad was constructed from Redding into Oregon in 1886 to 1887, its route was nearly identical with that of the earlier California-Oregon Trail and portions of the stage road (Hoover et al. 1966:503). Many of the railroad stations were built either on the exact line of the original trail, or very close to it. The railroad followed the western edge of the valley up past the town of Edgewood to Gazelle. From this point the route proceeded straight north across Shasta Valley, fording the Shasta River near the site of Montague before proceeding north to Willow Creek (Hoover et al. 1966:504).. While the influence of the railroad on early travel in the valley has not been discussed in detail, it can be generally stated that the influx of goods, livestock and population into the region undoubtedly increased as a direct result of its construction.

CHAPTER 4

INVENTORY/RESEARCH ORIENTATION

The purposes of these investigations were twofold and in many ways complementary. This project was designed to comply with federal policy which requires that a cultural resource inventory be undertaken prior to any action which may potentially affect significant cultural properties, pursuant to Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 170), and procedures of the Advisory Council on Historic Preservation (36 CFR 800) as manifested through BLM's Programmatic Agreement with the Council and State Historic Preservation Officer. Therefore, the primary goal of these investigations was to recover sufficient cultural resource inventory data on the potential land exchange parcels in order to fulfill the Bureau's legal requirements with respect to significant cultural resources (e.g., those sites potentially eligible for listing on the National Register of Historic Places). The second goal, interrelated with the first, involved producing a systematic body of data usable for archaeological inquiry relative to questions regarding culture history, change, process, and general lifeways. This inquiry aids in evaluating the significance of the sites discovered or previously documented.

This Shasta Valley inventory is probably the largest single archaeological survey project yet undertaken in this basin, and certainly one of the more rigid methodologically. The survey offered an opportunity for examining a localized segment of the greater valley with a cluster of relatively closely spaced observational units situated at the valley-foothill interface. This is a zone that hypothetically was important to prehistoric activities over the landscape due to ecotonal influences and certainly served, and still serves, as important rangeland for the sheep and cattle industry. However, the range is far less open now than it was during historic times. In addition, the lower end of the inventory zone falls within a location known to have served as an exploration and travel corridor from prehistoric times well into the historical period. It is for these reasons that the study area is considered to be potentially telling and unique. This apparent uniqueness forms the basis for the methodological and theoretical approach taken.

Research Objectives - Prehistory

After reviewing the archaeological literature for the region it was clear that considerable more work would be needed in order to fully comprehend the prehistoric cultural sequence and past socio-cultural behavior and dynamics. Questions regarding context, chronology, culture history, settlement/subsistence patterning, demography, group structure and dynamics, and process have yet to be adequately addressed for the aboriginal populations that occupied the study area during prehistoric times. The problem of context -- which involves viewing events and cultures within California in a broad areal perspective -- is considered to be beyond the scope of this study due to the limited nature of this investigation. Similarly, based on a largely surficial examination we realize that few inroads can be made regarding questions of socio-cultural processes and social change. In addition to addressing significance issues, it was envisioned that data obtained as a result of our investigations might be able to best contribute to the issues of settlement/subsistence patterns, raw material procurement strategies, trade/exchange networks, changes in land-use strategies over time, and culture history or chronology.

Four broad regional prehistoric research issues were identified and classified according to two data sets, the current status of archaeological knowledge for the Shasta Valley region in north-central California, and factors that contribute to sites being declared eligible for listing on the National Register of Historic Places (NRHP). The problem domains and research trajectories presented below were directed toward providing data for addressing broad regional issues as well as assisting in the evaluation of the information potential of each site or grouping of sites. Major questions which were to be addressed through data derived from the investigations, and that guided this research were:

(1). Culture history/chronology: The identification of prehistoric cultural lifeways and resultant diachronic changes in these lifeways which may have occurred over time in Shasta Valley.

(2). Settlement pattern and subsistence strategies: The identification of various settlement types and the relationship between site type or spatial artifact/feature patterning and resource procurement activities.

(3). Lithic technology patterns: The identification of technological processes and typological considerations associated with flaked stone tool manufacture or procurement of raw material or cores/blanks/flakes at each site, and the comparison with observed patterns at these sites with each other, as well as with those of surrounding sites in the region.

(4). Flaked stone procurement ranges and exchange networks: The identification of prehistoric obsidian procurement ranges and other flaked stone procurement strategies of the aboriginal inhabitants of Shasta Valley.

Research Issue 1: Culture history/chronology - the identification of prehistoric cultural lifeways and resultant diachronic changes in these lifeways that may have occurred over time in Shasta Valley.

For the past several decades the archaeology of hunter-gatherer research has relied heavily on two very general and simplistic assumptions that arose from discussions conducted during the *Man the Hunter* symposium held in the late 1960s (Lee and DeVore 1968:11).

1) they live in small groups, and
2) they move around a lot.

Even today, nearly three decades later, these assumptions form the basis of the majority of the interpretative frameworks being used in hunter-gatherer research and archaeologists continue

> to read the archaeological record of prefarming groups as one represented by small, ephemeral encampments occupied by a few people eating, sleeping, scraping hides, and only occasionally reproducing (Price and Brown 1985:3).

Another question of relevance has been presented by Yesner (1994). However affluent the local hunter-gatherer groups may have been, where seasonality of resources are an integral part of the settlement/subsistence system, the affects of episodic stress from resource imbalance may have affected the system. A possible answer to stress would be an intensification of use of certain resources. While this may be too fine-grained to discover in the sample surface survey, we will consider the possible implications of these stress periods and resource intensification on the evidence at hand. We also recognize that we are only dealing with a part of a larger settlement/subsistence system or systems. On the other hand, as pointed out by Hayden (1994:238), if there was an abundance of resources invulnerable to excessive exploitation then we might see evidence of increased societal complexity among local groups. We will examine this issue also, to the extent our sampling will allow.

Another aspect of the cultural record from which inventory data may prove fruitful is the degree of population aggregation and demography. This also can be looked at more simply. What fluctuations of use and space over time might be reflected in the inventory data? Variations could reflect population increase or decrease and resource increase or decrease, or changes in resource use. Ideological constraints or uses, if any, are beyond the scope of this study.

As limiting as these assumptions may be, they are only part of the problem when dealing with hunter-gatherer research for northern California. As noted by Connolly (1989:56),

> While archaeology moved, decades ago, far beyond the fundamentals of reconstructing spatial-temporal relationships among prehistoric cultural phenomena throughout most of North America, we are only now in the midst of this "primary archaeology" (Willey and Phillips 1958:11) in southwest Oregon/northern California.

The preceding chapters have shown Connolly's statement to be largely true, especially for the Shasta Valley region since to date cultural or chronological sequences have yet to be firmly established. This has resulted in a heavy reliance on extrapolations of data and sequences from contiguous regions for the prehistoric sequence of the locality. Although ethnographic and historical data provide some indication as to the manner in which contact period inhabitants adapted to Shasta Valley and the surrounding regions, these data are fragmentary and say virtually nothing of earlier populations in the area. Since they fail to provide the long-term perspective useful in answering questions of origins and cultural dynamics operating through time, it falls upon archaeological research to attempt to remedy the deficiency in our understanding of the chronological sequence.

As discussed in earlier sections of this report, it appears that Shasta Valley may have been occupied by both the Shasta as well as the Modoc peoples during at least the later prehistoric periods. This hypothesis is, in part, supported by the general impression conveyed in past literature which states that both social and spatial boundaries among hunter-gatherers are extremely flexible with regard to membership and geographic extent (Lee and DeVore 1968:7). Thus, through an analysis of the material culture it may be possible to define signature attributes of specific temporal components that may eventually aid in the identification of specific ethnic groups or culture change within a group. Site-specific research questions developed along these ends include the following:

1). Do any of the prehistoric sites or grouping of sites contain evidence of changes in social organization or territorial patterns which can be attributable to the movement of different populations into or through the area? If so, when does such a reorganization or transgression occur?

2). Who were the prehistoric inhabitants of Shasta Valley and what is their relationship to any neighboring ethnographic groups who may have used the region?

3). Are there any distinct ethnic markers such as trade items present within the site assemblages which may be attributable to ethnographic Shasta and/or Modoc peoples, or others farther away? If present, are the items regarded as indicators of cultural affinity, or as products of tribal exchange?

In addition, since projectile points serve as the primary temporal markers of the cultural complexes that make up the various chronological sequences, it was anticipated that projectile point data gathered during the investigation would be utilized in conjunction with obsidian studies to assist in the resolution of chronological issues. More specifically,

4). Do the diagnostic artifacts recovered indicate the time span during which the study area may have been utilized?

5). Which of the chronological sequences discussed in the previous chapter applies best to Shasta Valley material? Or can a new or revised sequence be posited?

Research Issue 2: Settlement pattern, population aggregations and subsistence strategies: The identification of various settlement/activity site types and the relationship between site type/isolate and resource procurement activities and demography.

Mobility strategies may be defined as the annual pattern of movement over the landscape pursued by hunter-gatherers, while "seasonal rounds" refers to the particular resources and locations exploited by a group of hunter-gatherers during different seasons of the year (Kelly 1983, 1985a, 1985b). Mobility strategies are important therefore in understanding how resources are procured (Shackley 1990:19).

Mobility strategy studies may be viewed as just one facet of a growing body of middle-range theory that deals specifically with forager subsistence economics (Shackley 1985:2). The value of hunter-gatherer mobility strategy theory is that it seeks to explain the variability within the archaeological record rather than simply creating another set of generalizations about hunter-gatherer behavior (Thomas 1983:11).

It should be clear from details presented in previous sections that while certain discrepancies exist over the delineation of territorial boundaries, the higher elevations of the study area most likely functioned as a peripheral zone in which the exploitable resources were shared by both the Shasta and Modoc groups, at least around the time of contact. Apparently, not only did several linguistically, unrelated, culturally diverse groups coexist within the study area, but the material culture which they may have introduced into the record is likely to have had widely separated origins further complicating the archaeological record of the region. In terms of understanding the role in which the study area served in aboriginal ecosystems, the area appears to have been attractive to groups centered in such diverse settings as the northern Cascades, Modoc Plateau, and Klamath Basin. Since subsistence strategies associated with each of these areas was likely to have been distinct, it is equally likely that the various groups that visited the region had functionally different reasons for exploiting the resources within the area. Alternatively, the upland strategies may have been quite similar and the archaeological traces from different cultures (e.g., toolkits), may of necessity have been quite similar.

The types and locations of sites found in the study area could contribute to a more complete understanding of the mobility systems practiced by the prehistoric inhabitants within their territories. Since the study area encompasses a wide range of elevations, both midden/village sites and seasonal camps or task specific workstations may be represented in the study area, representing the entire yearly cycle of the Shasta and/or Modoc or earlier people's transhumance. Furthermore, the location of such sites in relationship to available resources could elucidate the scheduling strategies involved in resource procurement. In other words, what environmental factors affected site placement? What place did resource variation and intensification of uses of certain resources, if any, have on the cultural system? We recognize that ideological or other social factors may also be involved in the decision making, but at this stage in the regional investigation we are satisfied to look at ecological parameters first.

Additional site-specific research questions developed to address issues concerning settlement/subsistence strategies include the following:

1). What food resources were available to the aboriginal inhabitants? Does the artifact assemblages reflect the use of all of the resources available to the aboriginal inhabitants or is there evidence for resource specialization at specific sites in the area?

2). What evidence of procurement activities is present at the various archaeological sites? Do these patterns reflect site function?

3), Are there any discernible differences in regards to resource procurement activities as evidenced by faunal and/or artifactual remains between the sites situated at various elevations?

Research Issue 3: Lithic technology patterns - the identification of technological aspects and typological considerations associated with flaked stone tool manufacture at each site, and the comparison between observed patterns at these sites individually and by group with those of surrounding sites in the region.

Following concepts introduced by Binford (1980) regarding residential and logistical mobility strategies, flaked stone technology and stone procurement in hunter-gatherer contexts can be viewed as a reflection of mobility and settlement/activity location choices made by the prehistoric people (Kelly 1985a, 1985b). To briefly summarize Binford's (1980) model, logistical mobility refers to the movement of organized task groups from a residential location to procure and/or process a variety of specific resources. A logistical strategy implies storage of processed resources and generally increased time spent at a particular residential base. The groups that practice this form of mobility are often referred to as "collectors."

In contrast, "foragers" are highly mobile groups who make relatively frequent residential moves in order to "map onto" a region's resource locations and relocate the group closer to the desired item. Because of the frequent residential moves associated with this type of strategy, foragers do not generally store foods. Instead, they procure and process the resources for immediate or nearly immediate consumption (Kelly 1985b). In the real world, of course, such black and white differences are more hypothetical than real and rarely occur. We envision strategies somewhere between these two.

As pointed out by Kelly (1992:55), reconstructing mobility strategies from prehistoric lithic technology is hampered by several difficulties. First, there are no simple relationships between mobility and tool manufacture and other variables such as tool function, raw material type, and distribution intervene. Also, the reconstruction of different tool manufacturing methods from debitage is loaded with interpretative difficulties, especially considering that the products of manufacture may have been removed to elsewhere. Lastly, stone tools are not routinely used to a significant extent by living foragers, making it difficult to ethnographically test ideas relating stone tools to mobility (Kelly 1992:56).

Despite these inherent difficulties involved in examining prehistoric lithic technological strategies, several site-specific research questions were developed in order to address concerns centered around this issue:

1). What can flaked stone tool analysis reveal about site function and regional settlement systems in the Shasta Valley area?

2). Are different lithic reduction strategies evident between the various toolstone material types used at the sites, namely obsidian, basalt, cryptocrystalline silicates, and chalcedony?

3). Are exotic materials such as obsidian brought into the study location in their raw form, as finished tools, or somewhere inbetween?

4). Did lithic procurement and stone tool technology play a "major" role in regards to activities conducted at any of the sites in the study area?

Research Issue 4: Lithic procurement ranges and exchange networks - the identification of prehistoric obsidian procurement ranges and lithic procurement strategies of the aboriginal inhabitants of Shasta Valley.

Since Binford's initial concepts were introduced, there have been a number of archaeological studies which have attempted to reconstruct prehistoric mobility by examining the organization of stone tool technologies (Binford 1979; Kelly 1985b; Shackley 1985, 1990). While it is true that there are a number of factors that affect tool production, use, and discard, one of the most important factors is undoubtedly the type and distribution of lithic raw materials (Kelly 1985b).

According to mobility theory, during logistical forays, or when the time spent at a residential base is brief, the lithic assemblage pattern is different. Due to the limited time spent at the specific locality, there would be little inclination for recycling and reuse of tools (Shackley 1985). Instead, the lithic materials noted in these types of assemblages would reflect the kinds of activities associated with tool maintenance of projectile points (e.g., numerous small retouch flakes), and show little evidence of use of inferior local materials. High percentages of tools made from non-local or high-grade exotic materials would also be evident in the personal gear. If high quality raw material is unavailable within the foraging radius or the length of time spent at the residential base is prolonged, the use of bipolar reduction techniques may become necessary, along with the reuse or scavenging of previously worked materials and incorporation of local, but potentially inferior material into the assemblage (Binford 1979).

Although patterns of obsidian dispersion can be accounted for, in part, by prehistoric exchange systems operating within a fairly elaborate socio-ceremonial system, ethnographic data and archaeological work conducted by Binford (1979), Shackley (1985, 1986, 1990) and others (Kelly 1983, 1985b; Meltzer 1984) suggests that among many hunter-gatherer populations the majority of the lithic raw materials enters into the system embedded within the subsistence procurement schedule.

While it is true that at the present time interpretations of stone tool assemblages along dimensions of mobility are largely subjective, characterizing the lithic raw materials within an archaeological assemblage and determining their source may be a potential indicator of at least a portion of the territory exploited through the annual cycle of seasonal rounds (Shackley 1985). Viewed in this manner, obsidian source profiles often relate more directly to aspects of residential mobility and group provisioning strategies than to specialized collection forays or formalized socio-ceremonial exchange relationships (Basgall 1989). Thus, with these perspectives in mind, the following questions regarding obsidian procurement studies were developed.

1). When does the use of obsidian into the Shasta Valley area occur and does it occur at a specific time? Are there any discernible differential preferences for various obsidian sources over time?

2). From what geochemical source group is the obsidian that is found in site assemblages in Shasta Valley originating? Is there any evidence of intersite variability with regards to obsidian use? Do each of the sites contain obsidian from the same geochemical sources in the same frequencies, or are there discernible differences between the various site types or at sites located at differing elevations?

3). If differences in obsidian procurement patterns exists between various sites assemblages, do they reflect different procurement strategies or ranges, or are they a simple reflection of trade with neighboring groups? (It is possible that the range of obsidian from different geochemical source groups is indicative of use of the Shasta Valley area by different aboriginal populations).

4). Is the use of obsidian restricted to certain tool categories or projectile point types? And if so, are the differences in the frequencies of tool stone types related to the distances from sites to sources, stone quality, tool function, or tool manufacturing techniques?

5). Do the frequencies of obsidian geochemical source groups correspond to those seen at sites located within the Klamath Lake Basin or surrounding regions?

Research Objectives - History

For the historic segment of this project, our research was directed toward an understanding of the manner in which historical sites and features integrated with, and were representative of, the historic cultural context as presented earlier. Thus, the purpose of this inquiry was to focus on three main areas of historic land use patterns as identified during archival research: exploration and transportation systems, settlement/homesteading, and livestock herding.

The following questions were addressed in relation to exploration and transportation studies:

1. How long and intensively were the various early transportation routes through Shasta Valley utilized?
2. Were there any visible differences in the differential usage of the trails in regards to various ethnic groups?
3 What place did roads and trails have on the economic development of the Shasta Valley and beyond?

Under the heading of settlement/homesteading studies, the following questions were addressed:

1. From what ethnic and socio-economic background were the peoples who settled the study area during historic times?
2. In what cultural activities did the early historic inhabitants engage?
3. What trade and/or transportation networks operated in the area, and how dependent or self-sufficient were the settlers on the outside world?

Since livestock herding in and around the study area was of importance, the following questions were addressed:

1. What routes were used to transport the livestock between the various summer and winter ranges?
2. Where were the livestock camps situated and what were the living conditions at the various camps?
3. Were the rock walls encountered throughout the study area related to livestock activities? If so, what ethnic group constructed these features?

4. Are there indications of variations spatially or temporally in animal husbandry practices within the study area, a possible reflection on economic conditions, range conditions, or other factors like transportation, disease, drought, etc?

CHAPTER 5

METHODOLOGY

Archival Research

An archaeological records search was conducted prior to project operations at the Bureau of Land Management, Redding Field Office by the authors. Prefield research also included a review of the records maintained by the California Historical Resources Information File System, Northeast Information Center, California State University, Chico, California, as well as Klamath National Forest Headquarters, and Siskiyou County Historical Records at the Siskiyou County Museum. A search of the permanent records at these facilities revealed a variety of cultural resources in the study area, which included archaeological, historical, and Native American ethnographic sites.

Nine previously documented archaeological sites had received state trinomials and were already recorded in the files of the Northeast Information Center. All but one of these previously recorded sites are located either within or adjacent to the southernmost parcels that surround Sheep Rock. These sites range in type from historic trail systems (e.g., Yreka Trail) to prehistoric habitation or special use sites that were occupied at varying intensities (e.g., midden deposits, rockshelters, lithic workshops). Figure 5 shows an elevational model of these sites in relation to the study area boundaries. The following recorded sites appear within study parcels or are directly adjacent to parcel boundaries:

Table 2: Previously Documented Archaeological Sites

SITE NUMBER	*DESCRIPTION*
CA-SIS-266	Prehistoric rock shelter/midden deposit (within)
CA-SIS-267	Prehistoric midden deposit/village site (adjacent)
CA-SIS-1160	Prehistoric lithic scatter (within)
CA-SIS-1272	Prehistoric lithic scatter (within)
CA-SIS-1273	Prehistoric lithic scatter (within)
CA-SIS-1274	Prehistoric lithic scatter (within)
CA-SIS-1275	Prehistoric lithic scatter (within)
CA-SIS- 1276	Prehistoric lithic scatter (within)
CA-SIS-1277	Prehistoric lithic scatter (within)
CA-SIS-1308	Prehistoric lithic scatter/historic camp (within)
FS#05-05-57-32	The Yreka Trail (within/adjacent)

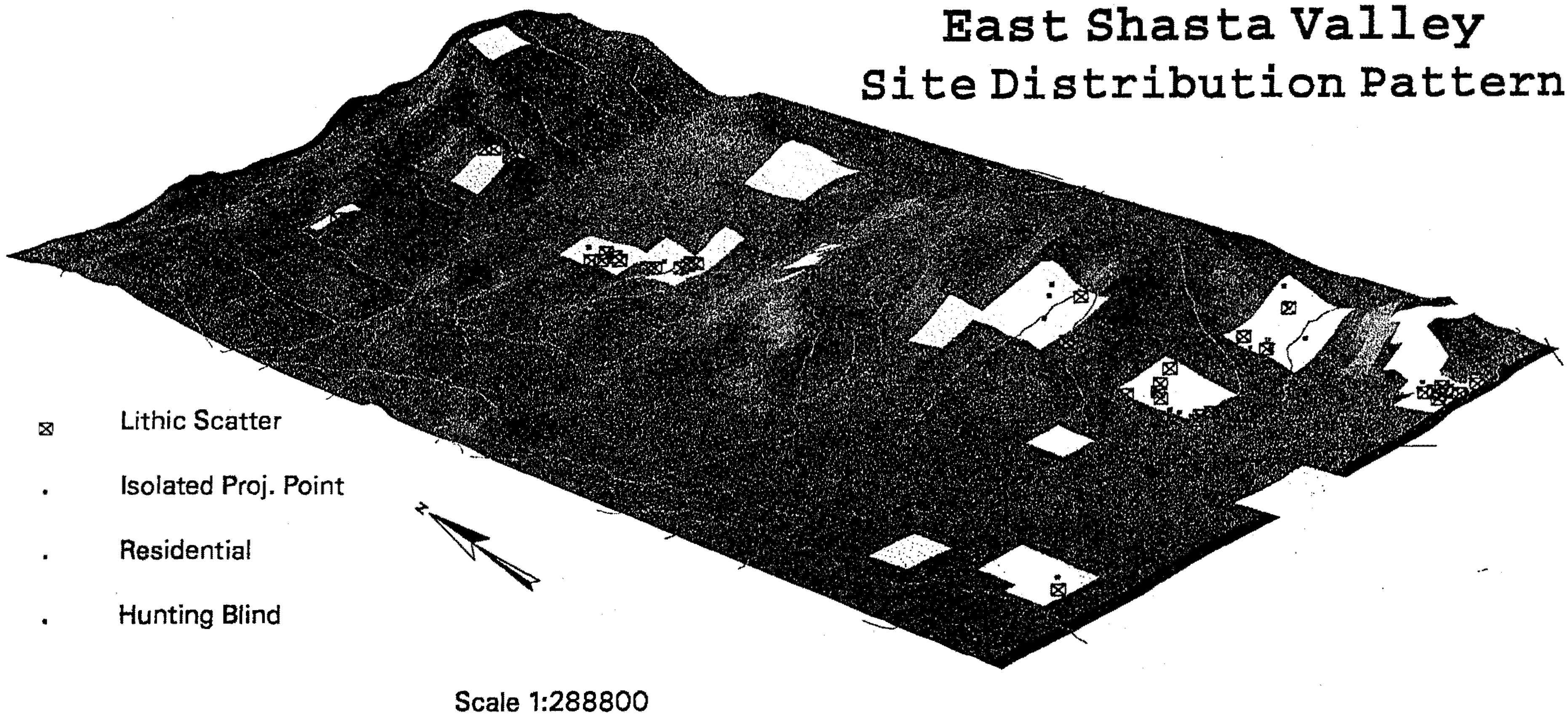


Figure 5: Elevational Site Model of Type Distribution

Government Land Office Plat maps indicate that there have been a number of homestead entries established within the study area between the years 1870 and 1917. The majority of these entries appear to have been either cash- or homestead-related, with parcels averaging 160 acres in size. Two Native American sites were mapped in the study area during the course of an Ethnographic Mapping Project by Theodoratus Cultural Resources, Inc. (1985) for the Bureau of Land Management. *Kwits-sahts-sah-wish*, a Shasta village, is reported to be located at a spring at the base of Sheep Rock, just north of Mt. Shasta. Sheep Rock, itself, is also considered to be a significant Native American landmark. According to consultants used by the Theodoratus group, the general area surrounding Sheep Rock was much used by the Shasta for temporary camps. The Shasta hunted and gathered such plant materials as *epos* in the general vicinity (Theodoratus Cultural Resources, Inc. 1984).

A review of the *National Register of Historic Places* (1978, with supplements to 1995), Hoover et al.'s *Historic Spots in California* (1966), and *California Historical Landmarks* (1982) revealed that there are several significant historic properties within the immediate and general vicinity of the study area. In addition to known population centers such as Little Shasta, there are several historic trails and roads that existed within the boundaries between the early 1850s to the early 1900s (see earlier chapter for detailed description of these locations). Local informants knowledgeable of the regional history were contacted regarding specific and general resources. They also provided unpublished documents useful in the study. These informants included Brice Martin, Richard Silva, James Rock, Mary Carpelan, and Norman Edwards.

Survey Strategy

The scope of work for this project necessitated that a complete archaeological survey be conducted of all parcels proposed for exchange. However, it was understood that it might not be possible to give complete coverage in some areas because of extremely heavy vegetation coverage or dangerous conditions, such as some of the precipitous slopes found throughout the study area. Accordingly, slopes in excess of 50 degrees, such as those located within the Sheep Rock area, were deemed intractable and presented the major impediment to survey. Dangerous cliffs were examined with binoculars.

The information provided in the background section of this report indicates that a variety of cultural resources could be expected to occur within the project area: prehistoric villages, seasonal camps, food processing stations, hunting sites, trails, and burials; and, historic structures, refuse deposits, logging features, trails, livestock herding features, and other early homesteading remains.

The strategy established for the field reconnaissance was based on previous surveys conducted within the general vicinity of the study area. These surveys had shown that areas with similar terrains and elevations included zones of high, moderate and low cultural resource potential (Detailed maps illustrating the survey strategy and coverage employed for the various study area parcels may be found in Hamusek et al. 1996).

A complete (Class III) survey strategy was followed for all zones of high resource potential. The on-foot survey of such areas involved survey crew members systematically walking the areas with transects spaced at 20-30 meters apart. Although grass, duff and deadfall occasionally were major impediments to visibility throughout the majority of these zones, ground visibility ranged from fair to good. In those areas in which dense accumulations of deadfall, slash and the occasional forest duff resulted in decreased visibility, litter was scraped away at periodic intervals to allow for better exposure. Cattle disturbance also contributed greatly to ground surface disturbance throughout the study area. Wherever possible subsurface exposures caused by off-road vehicle use, water erosion, rodent burrows, and deadfalls were closely inspected for evidence of buried cultural deposits. It is estimated that 33 percent (1330 acres) of the study area was inspected using this method.

For areas classified as having moderate resource potential, a less intensive survey strategy was employed (still considered Class III). This method differed from the previous strategy in that transects were spaced at 30 to 50 meters apart. It is estimated that 30 percent (1200 acres) of the study area was inspected using this method. The general statements regarding ground observations listed above apply here as well.

Finally, an intuitive/cursory survey strategy (Class II-III) was employed in areas considered to have low potential for cultural resources. These areas were surveyed by use of broad transects spaced 50 to 150 meters apart searching for areas exhibiting specific characteristics, such as springs, benches, knolls, hills, flats, rock outcrops, and rock overhangs that were considered to be favorable locations for prehistoric and/or historic activities. In several instances, transects down very steep ridges were made from nearby/adjoining Forest Service roads to access remote portions of the study area. It is estimated that approximately 28 percent (1150 acres) of the study area was inspected using this method. It should be noted that transects were not conducted in a robot or linear fashion, but involved zigzagging and inspection of geomorphological traits or locations judged more likely to hold evidence of prehistoric/historic use. Included were ridges, flats, escarpments, large boulders, drainage bottoms, terraces, and unusual features like points of land, slope interfaces, etc.

As stated previously, portions of the study area, particularly around Sheep Rock, contained extreme slopes which could not be traversed except through chutes or breaks in the slope. There were also areas of dense brush within this area (especially Section 26) which were virtually impassible. In all instances crew members attempted transects through some of these places whenever possible. However, it is conceivable, yet highly unlikely, that sites may exist in place of heavy vegetation which could not be inspected by crew members. It is estimated that approximately 9 percent (360 acres) of the study area could not be examined for cultural resources due to the steep slopes and/or heavy vegetation coverage which made survey impractical and dangerous. In addition, a total of 320 acres in the Sheep Rock area (Section 8) was deleted from the study due to a management decision prior to the completion of the field work. Hence, no additional survey was undertaken in these parcels.

All cultural resources encountered as a result of this phase of the investigation were formally recorded. Upon locating a cultural resource, site boundaries were identified through systematic reconnaissance of the area with crew members spaced at five meter intervals. Limited soil probing (with trowels) and duff removal was performed as appropriate during the evaluation stage of the site recordation on all sites not subjected to more intensive subsurface testing. A site was generally defined by the presence of ten or more associated artifacts and/or by a feature, such as a rock wall. Site boundaries were defined at the limits of the most peripheral features or concentrations of artifacts when no further archaeological remains were detected in an area 50 meters beyond them.

All cultural resource sites were recorded on Department of Parks and Recreation Archaeological Site Record forms and documented with black and white photography and/or color slides. In all cases mapping was accomplished with a hand-held compass used in conjunction with pacing. Most or all artifacts were flagged in the field during the recording efforts in order to assist with the determination of site boundaries as well as to perform further analysis on the individual debitage pieces. Diagnostic artifacts that were considered to be temporally sensitive were collected in addition to a sample of debitage from most sites, and an artifact collection record was completed (see Surface Collection Procedures below for further description). All previously recorded sites within the study area were re-evaluated using the same methods described above. The original site records were supplemented and amended and new site maps were drawn using updated standards.

Isolated diagnostic materials were collected, described on an isolated artifact form, and their locations were plotted as accurately as possible on 7.5' series USGS topographic maps. Non-diagnostic artifacts and isolated historic features such as small rock wall segments were recorded on an isolated artifact form, and their locations were noted on a map.

Site Evaluation

In order to meet the various management and research objectives of the archaeological investigation program, a variety of methodological approaches was employed. The purpose of these investigations was to gather and analyze data from each site in order to assess its integrity and potential for the National Register of Historic Places under Criterion D for prehistoric sites and Criterion D and other criteria for historic sites. Realizing that a limited range of data sets might be present within the prehistoric site deposits, an integrated approach was developed based on the surface reconnaissance results coupled with additional subsurface testing and laboratory analyses.

The subsurface testing program that we utilized was based on the programmatic treatment which has been developed for sparse lithic scatter sites by the State Office of Historic Preservation. The California Archaeological Resource Identification and Data Acquisition Program: Sparse Lithic Scatters was designed to provide the necessary documentation to satisfy reviewing agencies that sparse lithic scatters have been properly defined and evaluated.

This program was chosen since it was determined that the majority of the sites within the study area fell within the criteria used for classifying this site type.

As stated by Jackson et al. (1988:1), to qualify as a sparse lithic scatter, an archaeological flaked-stone deposit must:

1) contain only flaked-stone and lack other classes of archaeological materials (e.g., groundstone, fire-affected rock, bone or shellfish remains, pottery);

2) lack a substantial subsurface deposit; and

3) exhibit surface densities equal to or less than three flaked-stone items per square meter.

While this rule was generally followed, a few sites possessing a formed flake stone artifact or milling tool was also tested for the presence of a subsurface deposit.

Excavation Methods

The actual placement of the individual subsurface excavation units or shovel test units (STU) was determined in such a way as to maximize spatial coverage within the site area. Locations were generally selected in areas with higher surface artifact counts and/or away from site peripheries. This distribution was, of course, not random and smaller excavation units were placed in those site areas where recovery was likely to be low. The number of units varied with each site depending on the size of the site. Professional judgement was used in determining the number of units placed at a site. Since geomorphologically the foothill zone includes shallow, often colluvial soils and frequent bedrock exposures suggesting little sedimentary buildup, repetitious subsurface examinations beyond a unit or two was not considered necessary. In fact, in a few cases, even subsurface excavation was deemed unnecessary based on a soil/geomorphological assessment.

The minimum size of a STU was 0.5 x 0.5 meter square (e.g., 50 cm on a side). However, on occasion smaller units were employed (20 cm x 20 cm square) either by themselves or in combination with the larger unit size. Horizontal and vertical provenience was maintained by surface contour excavation. All units were excavated by hand using trowels, shovels and rock picks in arbitrary 10 cm levels. All sediments, in most instances, were passed through 1/8 inch mesh screen. However, 1/4 inch mesh screen was occasionally employed. Excavation continued until sterile soil was reached, the soil was considered non-cultural, a subsurface deposit was confirmed, or until a compacted bedrock substrate was encountered.

The recovered cultural materials were placed in bags labeled with the site number, unit number, stratigraphic level, excavators initials, and date. Information detailing the tools and procedures used in excavation, soil characteristics, non-artifactual soil constituents and cultural materials was recorded on field records for each unit.

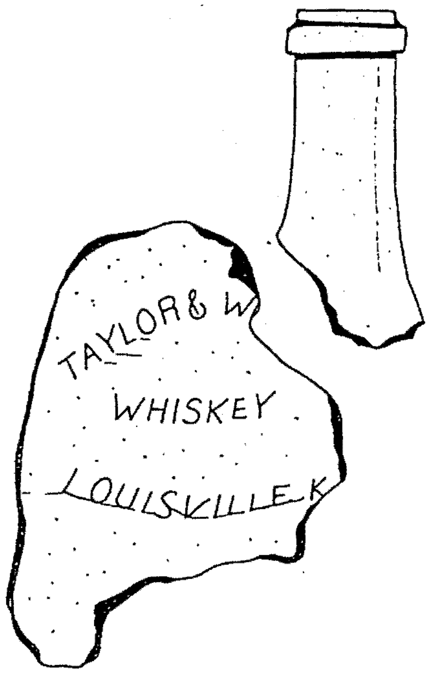
Surface Collection

In addition to excavation of site material, a collection of flaked stone was most often undertaken at each site (always when obsidian was present) in order to obtain a sample of debitage for additional analysis. Depending upon the size of the cultural deposit, debitage was collected either randomly across the surface of the site, or through the use of standardized two to four meter circular surface collection units. In all instances, the surface collection units were placed within the densest areas of lithic concentrations at each site. As with the excavation units, the recovered cultural materials were placed in bags labeled with the site number, surface collection unit number, collectors initials, and date. Occasionally, field observations were made of debitage types in addition to or in lieu of collecting a sample of lithics.

Lab Processing and Analytical Methods

All cultural materials recovered during the investigation were returned to the BLM office where they were cleaned, sorted and accessioned. As part of the accessioning process, length, width, thickness and weights were recorded for all formed tools. A total of 30 obsidian samples was submitted both for x-ray fluorescence analysis and rim hydration relative age determination to Biosystems, Inc. An additional 37 obsidian samples were submitted for only rim hydration relative age determination. The results of these analyses can be reviewed in Hamusek et al. (1996).

Debitage was sorted by provenience and type of material, with counts and weights being recorded for each category. Subsequent analyses, which required additional sorting and measuring, are discussed in the data analysis section of this report. All collected artifacts have been given catalogue numbers and are curated at the Bureau of Land Management, Redding Field Office under accession numbers linked to temporary individual BLM site numbers.



Amethyst whiskey bottle pieces from Isolate CA-030-736
near Walbridge Gulch (shown 1/2 size)

CHAPTER 6

INVENTORY RESULTS

The cultural resource inventory of the Shasta Valley Land Exchange Project resulted in the discovery and identification of 32 prehistoric archaeological sites, 15 historic archaeological sites and 10 prehistoric sites with historic components. In addition, nine previously recorded prehistoric sites were visited and the records updated. One hundred and nine isolated aboriginal artifacts or features and 41 historic artifacts or features were also located.

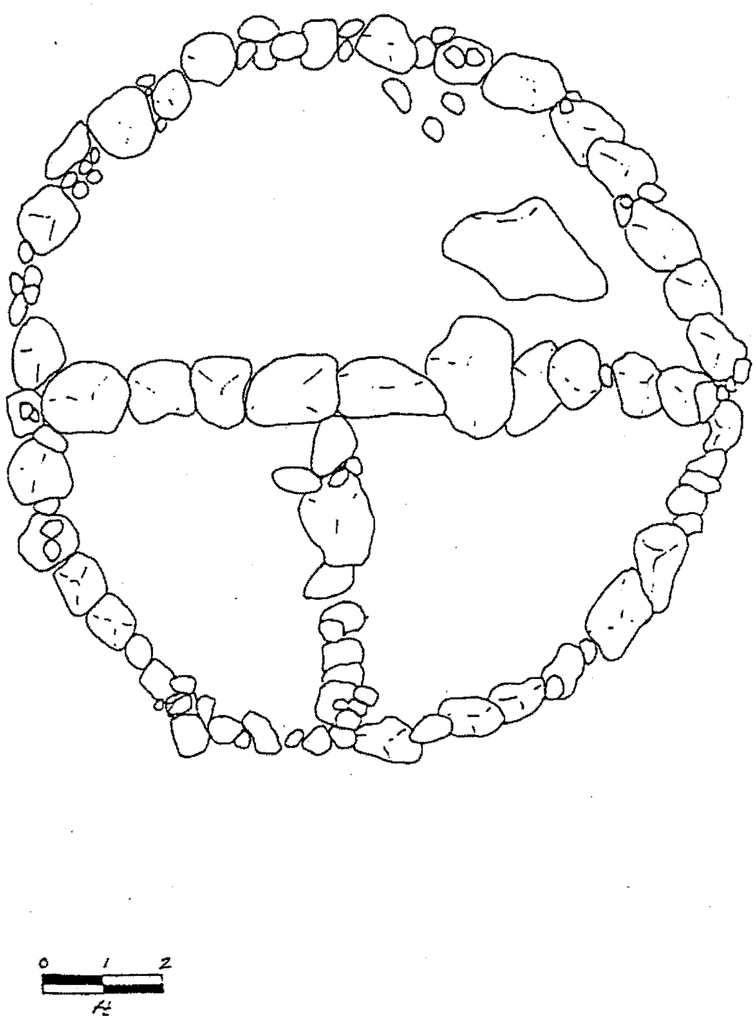
The following sections detail the results of the Phase I survey and Phase II testing program undertaken for this project. General data observations obtained as a result of these investigations will be presented for each of the various site types. A brief discussion of each site summarizing its significant characteristics follows. More detailed descriptions of these resources can be found in Hamusek et al. (1996). Discussions regarding the analyses of the projectile points, obsidian, and general flaked stone assemblage recovered from the sites will be presented in a separate section in this chapter. The stratigraphic and areal descriptions of these sites have been based upon an examination of data recovered from subsurface shovel test units, trowel and hoe scrapes, surface collections of diagnostic artifacts and lithics, local environmental assessments, in addition to general observations made during fieldwork.

Prehistoric Archaeological Sites

As a general observation, the archaeological sites located in the study area represent a somewhat restricted range of past human activities. All of the site types encountered fell within the predicted range which was based on the information available from archaeological, historical and ethnographic sources. The aboriginal sites can be divided into three broad categories:

1. Lithic scatters (40)
2. Occupation sites (including rockshelters - 2; middens - 3; and presumed temporary/seasonal camps - 3); and
3. Rock Enclosures (presumed hunting blinds) (3)

Generally speaking, the prehistoric sites encountered as a result of this study occur within all the primary landform types - valley, foothill and mountain. Although there are inherent biases with these data based on the nature of this study and the somewhat arbitrary distribution of parcels, it can be noted that 57 percent (n=29) of all sites encountered were found in a mountain context, while 41 percent (n=21) were found in the foothills and 2% (n=1) in the valley (Table 2). Conversely, approximately 62 percent of the study area is considered mountainous, 23 percent is foothill and 15 percent is considered to be associated with valley settings. That there was a higher percentage of sites situated within the mountainous setting is not unexpeced given that the study area encompasses a higher



Rock alignment from the Windy Wall Site (CA-030-701) on Sheep Rock

Table 3: Prehistoric Site Characteristics

BLM #	Site Type	Prim. Landform	Second. Landform	Elevation	Area	Depth	Vegetation	Hydro. Type	Hydro. Distance	Hydro. Period	Midden +/-	FCR +/-	Groundstone +/-	Projectile Points +/-	Debitage - Density	Other tools +/-	Site Integrity	Historic Remains +/-	Comments
144	RS	2	12	1182	1413	30	D	A	3	2	+	+	+	+	L	+	F	-	
242	LS	2	9	1180	6908	0	O	A	0	2	-	-	-	-	L	+	G	-	
325	LS	2	6	1040	12520	0	D	A	2	2	-	-	-	+	M	-	G	-	Circular rock alignment
326	LS	2	21	1040	2983	0	D	A	1	2	-	-	-	-	L	+	G	+	Yreka Trail
328	LS	2	21	1100	13345	0	D	A	1	2	-	-	-	-	L	-	G	+	Rock wall
329	LS	2	21	1080	2119	0	D	A	1	2	-	-	-	-	L	-	G	-	
330	LS	2	21	1135	707	0	D	A	1	2	-	-	-	+	L	+	G	-	
331	LS	2	7	1050	17348	0	D	A	2	2	-	-	+	+	L	+	F	-	
338	LS/HC	1	9	1475	11780		D	A	0	2	-	-	-	-	L	+	G	+	Historic hearth/trash
662	LS	2	20	1170	4710		D	A	0	2	-	-	-	+	L	-	G	-	
663	LS	2	20	1173	4082		D	A	3	2	-	-	-	+	M	-	G	-	
664	LS	2	20	1155	7339		D	A	1	2	-	-	-	+	L	-	F	+	Yreka Trail segment/historic trash/fence/rock wall
665	LS	2	20	1173	11225		D	A	1	2	-	-	-	+	L	-	P	+	Yreka Trail segment/historic trash/fence/rock wall
666	LS	2	20	1173	5220		D	A	3	2	-	-	-	+	L	-	G	-	
667	LS	2	20	1176	882		D	A	0	2	-	-	-	-	M	-	G	-	
668	OCC	2	18	1176	1373	30	D	A	3	2	+	+	+	+	H	+	G	-	
669	LS	2	20	1195	3061		D	B	0	1	-	-	-	-	M	+	G	-	
671	LS	1	3	1130	1378	0	D	A	0	2	-	-	-	-	L	-	F	-	
672	LS	1	7	1100	2769	0	D	B	0	2	-	-	-	+	L	+	F	-	
673	LS	1	18	1150	3768	0	DC	A	2	2	-	-	-	+	L	-	F	-	
674	LS	1	15	1160	1570	0	DC	A	1	2	-	-	-	-	L	+	F	-	
675	LS	1	8	1080	3022	0	D	A	0	2	-	-	-	+	L	-	F	-	
676	LS	2	4	1455	2120	0	D	A	0	1	-	-	-	-	L	-	G	-	
678	LS	4	20	855	423	0	D	A	0	2	-	-	-	+	-	+	F	-	
679	LS	1	18	1145	4239	0	D	A	1	2	-	-	-	+	L	+	G	-	
680	OCC	1	3	1085	15111	30	D	A	1	2	+	+	-	+	H	+	G	-	
681	LS	1	3	1100	3316	0	DC	A	1	2	-	-	-	-	M	+	G	-	
682	LS	1	9	1160	7006	0	D	A	2	2	-	-	-	-	L	-	G	-	
683	HB	1	6	1125	12	0	D	A	3	2	-	-	-	-	-	-	F	-	Hunting blind
684	HB	1	18	1150	1530	0	D	A	0	2	-	-	-	-	-	-	G	+	Rock hunting blinds may be historic
685	LS	1	4	1105	785	0	D	A	2	2	-	-	-	-	L	-	F	-	
686	LS	1	4	1105	588	0	D	A	1	2	-	-	-	-	L	-	G	-	
687	LS	2	3	1176	18840		D	A	1	2	-	-	-	-	L	+	G	-	
688	LS	2	9	1228	6672		D	B	1	2	-	-	-	-	l	-	G	+	Yreka Trail segment
690	TC	1	3	1280	12089	0	D	A	3	2	-	-	+	-	L	+	F	+	Historic cattle trail/glass/cut nail
691	HB/RW	1	9	1330	883	0	D	A	3	2	-	-	-	-	-	-	G	+	One feature may be historic wall segment
692	TC	2	3	1219	8792	0	D	AB	1	2	-	-	+	+	L	+	G	+	Haight Bros. Cattle Trail
693	LS	1	4	1277	5181	0	D	A	2	2	-	-	-	+	L	-	F	+	Historic cattle trail
695	LS	1	3	1130	451	0	DC	A	1	2	-	-	-	-	L	-	F	-	
696	LS	1	8	1430	24178	0	DC	A	0	1	-	-	-	+	H	+	G	-	
697	LS	1	8	1420	7065	0	DC	A	0	1	-	-	-	-	L	-	G	-	
698	LS	1	4	1440	18718	0	DC	A	0	1	-	-	-	-	L	-	G	-	
699	LS	1	3	1207	9420	10	D	A	1	2	-	-	-	-	L	-	G	+	Cans (3)
700	TC	1	3	1236	35325	10	D	A	1	2	-	-	+	+	L	+	F	-	
702	LS	1	21	1270	993	0	DE	A	1	2	-	-	-	-	L	-	P	-	
703	LS	1	4	1300	14287	10	DC	B	1	1	-	-	-	+	H	-	F	-	
705	LS	1	9	1590	2748	0	D	A	3	2	-	-	-	+	L	-	F	-	
706	OCC	1	8	1300	14287	20	DC	B	1	1	+	-	-	+	M	+	P	-	
708	LS	1	21	1180	2159	0	D	A	1	2	-	-	-	-	L	-	F	+	Historic trash/features
709	LS	2	4	1090	2072	0	D	A	0	2	-	-	-	-	L	+	G	-	
711	RS	1	12	1500	85	20	D	A	0	2	+	+	+	-	L	-	P	-	

Codes

Site Types

RS - Rockshelter
LS - Lithic Scatter
HC - Historic camp
OCC- Long term residential
TC - Short term residential
HB - Hunting blind
RW - Rock wall

Primary Landform

1 - Mountain
2 - Foothill
4 - Valley

Secondary Landform

3 - Ridge top
4 - Ridge slope
6 - Hill top
7 - Hill slope
8 - Bench
9 - Saddle/pass
15- Drainage bottom
18- Other
20- Flat
21- Streamside bench/terrace

Depth

In centimeters

Vegetation

C - Oak Woodland
D - Juniper/Sage Woodland
E - Mixed Conifers

Hydro. Type

A - Stream
B - Spring

Hydro. Distance

0 - greater than 250 meters
1 - 0 - 50 meters
2 - 51 - 100 meters
3 - 101 - 250 meters

Hydro. Period

1 - Permanent
2 - Intermittent

Debitage Density

L - Low
M - Moderate
H - High

Site Integrity

F - Fair
G - Good
P - Poor

percentage of this type of landform. However, it is surprising that there was a relatively equal percentage of this landform type present in the study parcels. Preservation factors aside, the implication here is that there are behavioral differences in operation that are influencing prehistoric settlement choices.

When examining the secondary landforms in which the sites were discovered, a more diverse breakdown begins to take place. At this level of analysis prehistoric sites are found to occur in a wide variety of geomorphological contexts. Ridgetops, ridgeslopes, saddle/passes, hilltops, hillslopes, terraces, benches, drainage bottoms, and valley flats (plain-like) represent the various types of topographic features in which prehistoric sites are commonly encountered.

Virtually all of the prehistoric sites documented are situated within a Juniper - Sage Woodland community at elevations that range from 855 meters to 1590 meters (average elevation = 1120 meters). As previously mentioned, the study parcels vary between 792 meters and 1768 meters in elevation.

Of the fifty-one prehistoric sites encountered, 21, or 41 percent, were found to be within 50 meters of a permanent and/or seasonal water source, while six, or 12 percent, were between 51 and 100 meters of some type of ephemeral to permanent water source. We realize that hydrology patterns are likely to have changed over time. It is interesting to note that while proximity to water appears to have been a main consideration for aboriginal group residential/activity decisions, when an examination of the remaining hydrological distance data and non-residential site information is compared, there appears to be very little correlation between distance to water and proximity of site. Approximately 31 percent (n=16) of all prehistoric sites were situated at distances greater than 250 meters from any type of water source, while 16 percent of all sites (n=8) were located at distances between 100 and 250 meters from water. If the data for site proximity to water source were combined for the nearest (0 - 100 meters) and farthest (100 -greater than 250 meters) distances, one would see that there is a nearly equal breakdown in site locations (53 percent for nearest vs. 47 percent for farthest).

A similar breakdown occurs when the size of the site is plotted against the distance to water. There appears to be no distinct correlation between the size of the site (e.g., larger sites closer to water) and proximity to water. While this lack of correlation appears to be the general rule for lithic scatter sites as well (42.5 percent, n=17 within 50 meters and 35 percent, n=14 greater than 250 meters), it does not appear to hold true for residential sites. In general, there does appear to be some correlation with the type of residential site (e.g., open air sites vs. rock enclosures) and their proximity to water. When the residential sites are factored separately from the lithic scatters and presumed hunting blinds, the data reveal, not surprisingly, that four of the five open air residential sites are located within 50 meters of a permanent water source (80 percent) and all three rock shelter sites are situated at distances greater than 100 meters of any type of water source. Only one of the five open-air sites (CA-030-690) was situated at a distance greater than 100 meters from a water source.

Of the fifty-one sites examined, 86 percent (n=44) were associated with a seasonal and/or intermittent water source, while only 14 percent (n=7) were associated with a permanent and/or year-round water source. Examination of the type of water source reveals that 88 percent (n=45) of the sites are associated with streams or drainages of varied hydrological flow rates; 10 percent (n=5) with springs, and 2 percent (n=1) with both spring and stream.

Lithic Scatters

The most frequently occurring site type encountered within the study area was the lithic scatter. Of the fifty-one prehistoric sites recorded, forty consist of lithic scatters only. These sites occurred in a variety of geomorphological contexts and were generally found without any other cultural materials in close association. They were characterized by as few as 20 flakes to as many as 1000 or more specimens, including projectile points, core tools, and bifaces (Table 2).

The lithic scatters ranged from large (CA-030-696; 24,178 square meters) to small (CA-030-678; 423 square meters) and in comparison with the residential sites (which include temporary/seasonal camps, rock shelters, and middens with and without housepits), the average size of the lithic scatter sites was generally smaller (average size of lithic scatter = 6,200 square meters; average size of residential sites = 11,059 square meters). The sites were all situated within a Juniper - Sage Woodland vegetation zone at an average elevation of 1192 meters.

The majority of the lithic scatter sites encountered contained flakes from locally occurring cryptocrystalline silicates and chalcedony in addition to exotic imports such as obsidian and, perhaps, artifact quality basalt. A total of 25 sites (62.5 percent) possessed both local as well as exotic materials, while 10 (25 percent) sites possessed only exotic materials. The debitage assemblage of the remaining sites (n=5 , 12.5 percent) contained only flakes of locally occurring chalcedony and cryptocrystalline silicates.

The density of debitage encountered at each of these sites was, in general, quite low. The majority of the lithic scatters encountered was classified as sparse, oftentimes highly dispersed, low-density surface scatters that extended across the landscape. None of the lithic scatter sites encountered revealed any indications of having a subsurface deposit (Table 2). Moreover, of the 40 lithic scatters recorded, 85 percent (n=35), were considered to fit into this category of low-density scatters (less than or equal to 1 flake/10 m^2). The remaining 15% consisted of moderate- (n=4, 10 percent, 1 flake/10 m^2 to 5 flakes/ 1 m^2) and high- (n=2, 5 percent, 5 to 40 flakes/ 1 m^2) density flake scatters.

As discussed previously, proximity to water was judged to be a factor in the analysis of site settlement/use patterning for residential sites. However, for lithic scatter sites, not surprisingly, it appears that the distance to water was less of a determinate than the resource itself. Of the lithic scatter sites examined, 42.5 percent of the sites are within 50 meters of a seasonal water source. However, a nearly equal percentage (35 percent) of these sites is found located away from all sources of water (e.g., greater than 250 meters). Moreover, the majority of these water sources appeared to be seasonal and/or intermittent in nature and are associated with old stream channels.

Occupation/Residential Sites

Occupation or residential sites as defined here include all sites that appear to possess some indication of either long-term occupation and/or repeated use as well as temporary/seasonal use. From various ethnoarchaeological studies (cf. Nicholson and Cane 1991), we recognize that some lithic scatters may have been residential sites and some occupation sites may have served in part as tool making locales. A total of eight prehistoric sites was considered to fall into this category and included two rockshelters (CA-SIS-266, CA-030-711), three long-term occupation sites with midden (CA-030-668, -680, -706), and three temporary/seasonal camps (CA-030- 690, -692, -700). All eight sites contain the remains of high- to low-density scatters of lithics and a few groundstone implements. The size of the sites ranges from 85 square meters for the smallest rockshelter (CA-030-711) to 35,325 square meters for a temporary/seasonal camp (CA-030-700). The average size of the occupation sites is 11,059 square meters.

The average elevation at which residential sites could be found was 1247 meters, with a range between 1085 meters and 1500 meters. Five of the eight occupation sites were situated on flat ridgetops or benches (62.5 percent), while two were within rock overhangs/alcoves (25 percent). The remaining, and perhaps the most intensively occupied site (CA-030-680), was situated within a schollendome formation at the valley/foothill interface at the base of Sheep Rock. As discussed earlier, schollendome formations are a type of geological feature which occurs when a crust of molten lava collapses to form a shallow depression (see Chapter 2 for further discussion regarding schollendome formations).

The artifact assemblage noted at residential sites consists of a variety of groundstone artifacts such as unifacially and bifacially worked manos, unshaped boulder metates, and hammerstones. Also noted were numerous edge-modified flaked stone tools, unifaces, bifaces, cores, cobble core tools, and complete and/or fragmentary projectile points, in addition to debitage waste flakes from locally derived as well as exotic sources.

The presence of presumed housepits or structural depressions was noted only at CA-030-680. Three circular depressions were observed at this site. All three depressions measure approximately 3.5 to 4.0 meters in diameter and are relatively shallow measuring 20 to 30 centimeters in depth. Although the presence of housepits was conspicuously absent from the archaeological record at the remaining occupation sites, it must be pointed out that disturbances to these sites were fairly widespread as a result of historic stock management and lumbering activities, thereby making the study of this aspect skewed. Nevertheless, what these data do indicate is that portions of the study area, especially around Sheep Rock, were being utilized for long-term or repeated residential-oriented visits by prehistoric peoples.

Rock Enclosures/Hunting Blinds

Three of the fifty-one prehistoric sites consist of small, isolated rock enclosures or presumed hunting blinds located within the more mountainous portions of the study area (CA-030-683, -684, -691). Elevations at which this site type was found range from 1125 meters to 1329 meters with the average equaling 1201 meters. Two of the three sites were found along saddles/passes, while one was encountered on a prominent hilltop. The area which encompassed the enclosures was fairly small and confined, averaging 808 square meter in size (range 12 square meters to 1530 square meters).

The rock features are all roughly circular in shape and were constructed from naturally occurring andesitic and basalt boulders and cobbles. In all instances it appears that construction of these features was, in part, dependent upon the natural configuration of large boulders. In other words, when a concentration of large boulders was found in a suitable location, it appears that smaller cobbles and boulders were placed between and around these boulders to form a circular enclosure which was then utilized. The features measured approximately two to three meters diameter in size and were roughly one meter high. Although diagnostic artifacts were absent from the immediate vicinity of these features, at all three sites they were covered with a fairly heavy growth of lichens and moss on the boulders indicating some age.

Projectile Point Analysis

A total of 42 projectile points, 37 of which were considered to be sufficiently intact for provisional classification, was encountered. Table 4 provides the metric and provenience data for the various types recovered during the inventory/testing program. In describing the points, specimens were identified as to type utilizing pre-existing identification keys that had been developed by Aikens (1970), Baumhoff (1957, 1985), Basgall and Hildebrandt (1989), Baumhoff and Byrne (1959), Bedwell (1970), Gruhn (1961), Hester (1973), Heizer and Baumhoff (1961), Heizer and Hester (1978), Lanning (1963), Layton (1970), Mack (1982), O'Connell (1970), Sampson (1985), Thomas (1981), and Treganza (1958) to deal with north-central California, the Great Basin, and southern Oregon occurences.

The 37 projectile point specimens considered here are described below by type, in roughly chronological order from the oldest to youngest. The number of specimens differentiated by material is given for each type, along with illustration reference and accession numbers. The metric data for individual specimens are presented in Table 4. Finally, temporal ranges are ascribed for the various types when known.

Table 4: Metric Attribute Data for Projectile Points Recovered in Shasta Valley

Accession Number	Type	Material	L (cm)	W (cm)	T (cm)	Wt. (gms)	Obsidian Source	Hydration Rim Reading
681-1A	NSN	OBS	(.8)	(2.1)	.45	.1	GF	NA/DFVw
680-7	NSN	OBS	(2.2)	(1.6)	.5	1.4	GG	NA/HV
662-3	NSN	OBS	(1.4)	2.85	.6	1.9	-	-
753	Elko	OBS	(2.2)	1.5	.4	1.4	-	-
700-4	McKee	OBS	(2.7)	1.4	.7	2.7	GF	6.5
696-1	McKee	OBS	4.1	1.5	.6	3.4	GG	3.6
329-1	McKee	OBS	(2.4)	1.4	.75	1.4	GG	6.4
703-1	ClSN	OBS	2.9	1.6	.5	1.9	vGF	5.4
662-1	ClSN	OBS	(2.0)	(1.45)	.4	1.1	-	-
678-3	ClCN	OBS	(1.6)	1.9	.35	1.0	-	-
814	ClSN	OBS	1.8	(.9)	.35	.5	-	-
678-1	ClSN	OBS	(2.9)	1.45	.4	.75	GG	5.2
664-1	ClSN	OBS	3.65	1.7	.5	1.95	GG	NVH
680-2	ClSN	OBS	3.2	(1.6)	.5	1.25	GF	2.3
681-1B	ClSN	OBS	(1.5)	1.55	.4	.8	-	-
703-2	SSN	OBS	3.25	1.25	.4	.5	vGF	5.3
693-3	SQCS	OBS	(2.5)	1.9	.65	2.5	-	-
706-1	GBCS	OBS	1.9	1.5	.4	.8	-	-
789	GBPS	OBS	2.1	1.3	.3	.5	-	-
734	GB	CHAL	(2.9)	2.0	.3	1.1	-	-
830	GBCS	OBS	(1.7)	1.1	.3	.6	-	-
757	GBG	OBS	(2.6)	1.6	.4	1.6	_	-
674-1	GBG	OBS	(1.3)	(1.3)	.3	.9	vGF	3.8
325-4	GBG	OBS	(1.0)	1.75	.25	.4	vGF	3.1
706-2	GBG	OBS	(1.8)	(1.7)	.4	.25	vGF	2.6
692-1	DSN	OBS	(2.5)	1.6	.4	.5	GG	3.1

Table 4: Continued

Accession Number	Type	Material	L (cm)	W (cm)	T (cm)	Wt (gm)	Obsidian Source	Hydration Rim Reading
700-1	CNm	OBS	(1.9)	2.1	.4	.9	vGF	5.0
678-2	CNl	OBS	(2.3)	(2.0)	.8	5.15	vGF	5.5
700-3	CNl	OBS	(1.0)	(2.35)	.75	1.8	-	-
668-2	SNr	OBS	(1.75)	(1.2)	.4	.5	vGF	5.2
325-2	SNr	OBS	2.45	(1.2)	.35	.7	vGF	7.4
697-1	SNm	OBS	(2.3)	2.0	.5	1.8	vGF	5.1
673-1	SNm	OBS	(2.2)	(1.9)	.5	1.0	GG	NA/DFV
325-1	SNl	OBS	(2.0)	(1.8)	.3	1.2	GF	6.0
703-3	SNm	OBS	(2.5)	1.4	.4	1.0	GG	6.8
700-2	SNl	OBS	(1.6)	(2.95)	(.55)	2.5	-	-
663-2	SNm	OBS	(.7)	(1.4)	(.3)	.3	-	-
814	UNID	OBS	(1.8)	(1.8)	(.3)	.5	-	-
325-3	UNID	OBS	(2.2)	(1.4)	(.4)	1.3	-	-
325-5	UNID	OBS	(1.15)	(1.5)	.4	1.2	-	-
830B	UNID	OBS	(.9)	(.7)	(.3)	.6	-	-
778	UNID	OBS	(1.8)	(1.1)	(.3)	.3	-	-

KEY

NSN - Northern Side-Notched
ClCN - Clikapudi Corner-Notched
ClSN - Clikapudi Side-Notched
SSN - Siskiyou Side-Notched
SQCS - Squaw Creek Contracting Stem
GBCS - Gunther Barbed Contracting Stem
GBPS - Gunther Barbed Parallel Sided Stem
GB - Gunther Barbed - "Classic"
GBG - Gunther Barbed General Series
DSN - Desert Side Notched
CNl - Corner Notched large size
CNm - Corner Notched medium size
CNs - Corner Notched small size
UNID - Unidentifiable fragment

SNr - Side-Notched reworked
SNm - Side Notched medium size
SNl - Side Notched large size
Wt - weight
L - length
W - width
T - thickness
v - source visually identified
GF - Grasshopper Flat/Lost Iron Wells/Red Switchback
GG - Grasshopper Group
NA - Reading not available
NVH - No visible hydration band
other terms see hydration listing

1. Northern Side-Notched Series Obsidian (3); (Figures 6 a-c)

Gruhn (1961) originally defined this point type to describe a series of large side notched specimens. These points are usually flat to lenticular in cross-section, with notches beginning low on the side of the point and extending diagonally upward or straight into the body (O'Connell 1970). Although the Northern Side-Notched series points bear strong morphological similarities to Desert Side-Notched series points, they are clearly distinguished on the basis of their larger overall size and weight, and in terms of both larger neck and basal widths.

Northern Side-Notched projectile points are found throughout the southern Columbia Plateau and northern Great Basin in deposits dating from approximately 5000 B.C. to 1000 B.C. (Heizer and Hester 1978:13). They have also been observed in north-central and northeastern California site assemblages such as Nightfire Island in the Lower Klamath Lakes Basin (Hughes 1983; Sampson 1985), Eagle Lake (Pippin et al. 1979), Upper Sacramento River Canyon (Banks 1984:541-542), Squaw Creek (Clewett and Sundahl 1983), the Pit River region (Kelly et al. 1987), in addition to the Butte Valley area (Hamusek 1993).

A total of three fragmentary specimens, all of which were fashioned from obsidian, was recovered from the Shasta Valley investigation (680-7, 681-la, 662-3). The assignment of these specimens to the Northern Side-Notched series is based on morphological comparison provided by Heizer and Hester (1978) and Gates (1983). One of the specimens (681-1a; Figure 6a) is represented by the basal portion of what was originally a much larger point. This specimen possesses deep side notches and its basal element is slightly concave. It has been fashioned from obsidian originating from the Grasshopper Flat/Lost Iron Wells/Red Switchback (GF/LIW/RS) geochemical group in the Medicine Lake Highlands.

Specimen 680-7 (Figure 6b) is also fragmentary and is large and triangular in outline. Only one lateral blade margin is present. It is straight and possesses a "U" shaped notch on the lower portion of the blade. The base of this specimen is straight. This specimen has been fashioned from obsidian derived from the Grasshopper Group (GG) geochemical source in the Medicine Lake Highlands (see Obsidian Studies section for further discussion on the geochemical distinctions between GF/LIW/RS and GG obsidians).

The remaining specimen (662-3, Figure 6c) consists of the basal portion of an originally much larger point. This specimen possesses deep lateral notches that extend upward into the body of the base which is slightly concave. It also possesses a snap fracture at the point of its basal notch. All three specimens appear very weathered which is perhaps a reason why hydration rim readings were unobtainable. Northern Side-Notched projectile points represent 8.0 percent of the projectile point sample recovered from Shasta Valley.

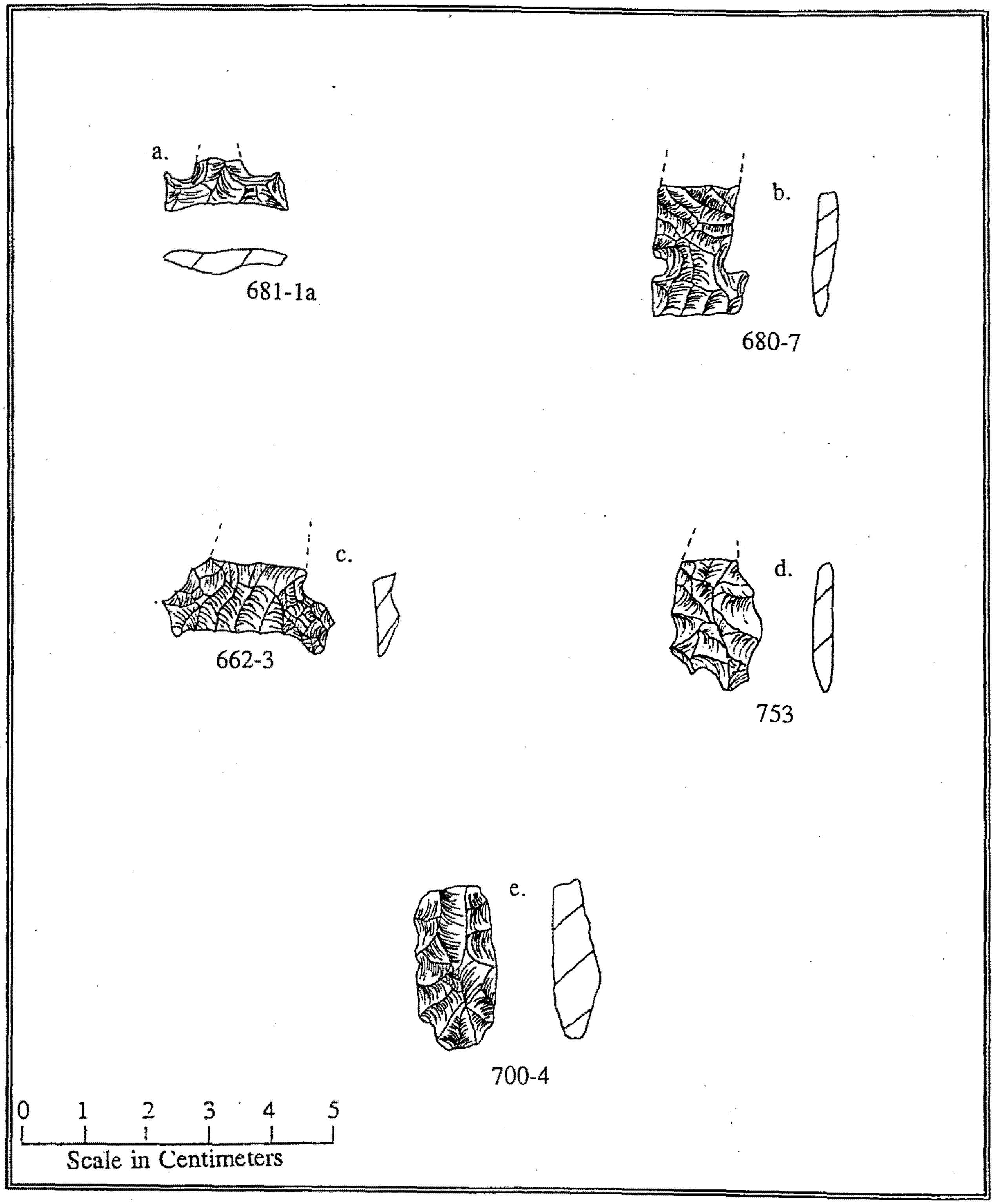


Figure 6: Northern Side-Notched, Elko and McKee Projectile Points

2. Elko Series Obsidian (1); (Figure 6d)

Elko Series projectile points were originally defined by Heizer and Baumhoff (1961) and later described by O'Connell (1970) as large triangular points that are corner notched and possess short broad stems. The blade edges are frequently straight or slightly convex. Originally several varieties were noted. In addition to the corner notched ones defined by Heizer and Baumhoff (1961), "side notched," "eared" and "contracting stems" were also included within this series. However, a redefinition of this series by Thomas (1981:21-22) suggested the elimination of the side-notched variety as a recognized sub-type and subsuming the contracting stem into the Gatecliff Series. The temporal placement of Elko Series points within the western Great Basin and northern California region has been proposed as ranging from 2000 B.C., or later, up to A.D. 600 (Heizer and Hester 1978). A time period of 1300 B.C. - A.D. 700, however, has alternatively been proposed by Thomas (1981:32-33).

One obsidian specimen (Isolate #753), representing 2.7 percent of the total sample, was recovered in Section 26. This specimen is medium in size, generally triangular in outline, and possesses weak shoulders with shallow side notches. The lateral blade margins of this specimen are straight to slightly convex and the basal margin is concave with deep "V"-shaped notches. On the basis of morphological characteristics this specimen has been assigned to the Elko Eared subtype.

3. McKee Series Obsidian (3); (Figures 6e - 7b)

Originally defined by Baumhoff (1985), McKee Series points encompass medium-size, bipointed artifacts which are unifacially modified and keeled in cross-section. Currently, there remains some debate as to whether these artifacts are, in fact, projectile points and/or some other kind of tool. Unifacially modified foliate points such as these have a wide distribution throughout the North Coast and southern Cascade mountain ranges. They also occur throughout the stratigraphic sequence at Nightfire Island. However, many of these forms appear to lack the extreme keeling characteristics of the classic McKee type (Sampson 1985). Available chronological data suggest that the McKee series occurs most frequently in contexts pre-dating 1000 B.C. (Basgall and Hildebrandt 1989:170). A temporal range of 2300 B.C. to 700 B.C. has been proposed for the McKee Series by Basgall and Hildebrandt (1989). Mack (1991:39) suggests they date from 3000 B.C. to 1500 B.C.

A total of three obsidian specimens, representing 8.0 percent of the total sample, was recovered from the study area. These specimens (696-1, 329-1, 700-4) are medium in size, thick in cross-section, and appear to have been made on large flake blanks rather than blade-flakes as noted by Baumhoff (1985:185). Finally, marginal retouch is commonly spaced widely on all three specimens, giving the tool edge a serrated surface. All three specimens were fashioned from obsidian deriving from the GG and, in one instance, more specifically, the GF/LIW/RS geochemical source group. Obsidian hydration rim readings obtained on the three specimens are 3.6, 6.4 and 6.5 microns.

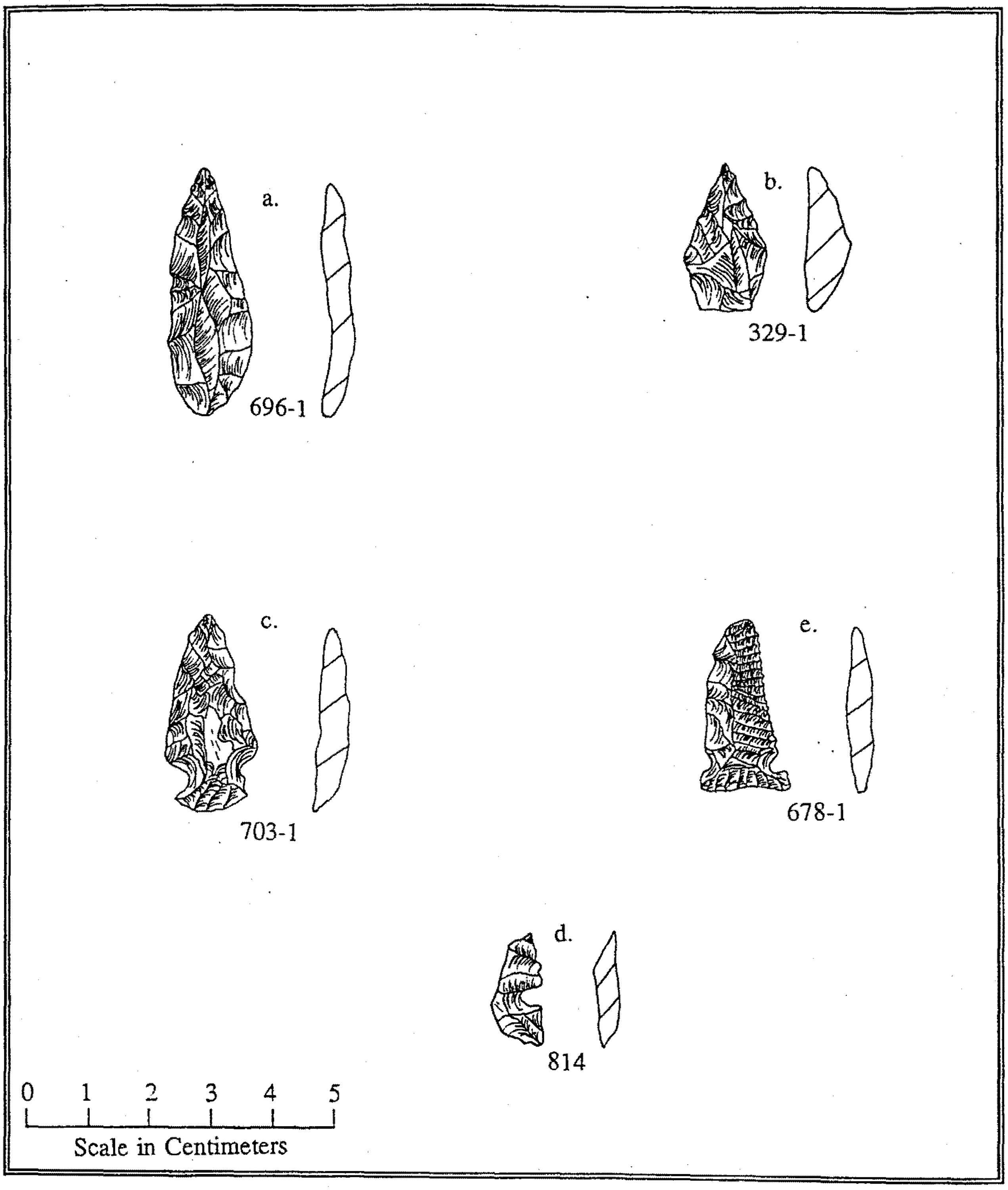


Figure 7: Elko, McKee, and Clikapudi Notched Series Projectile Points

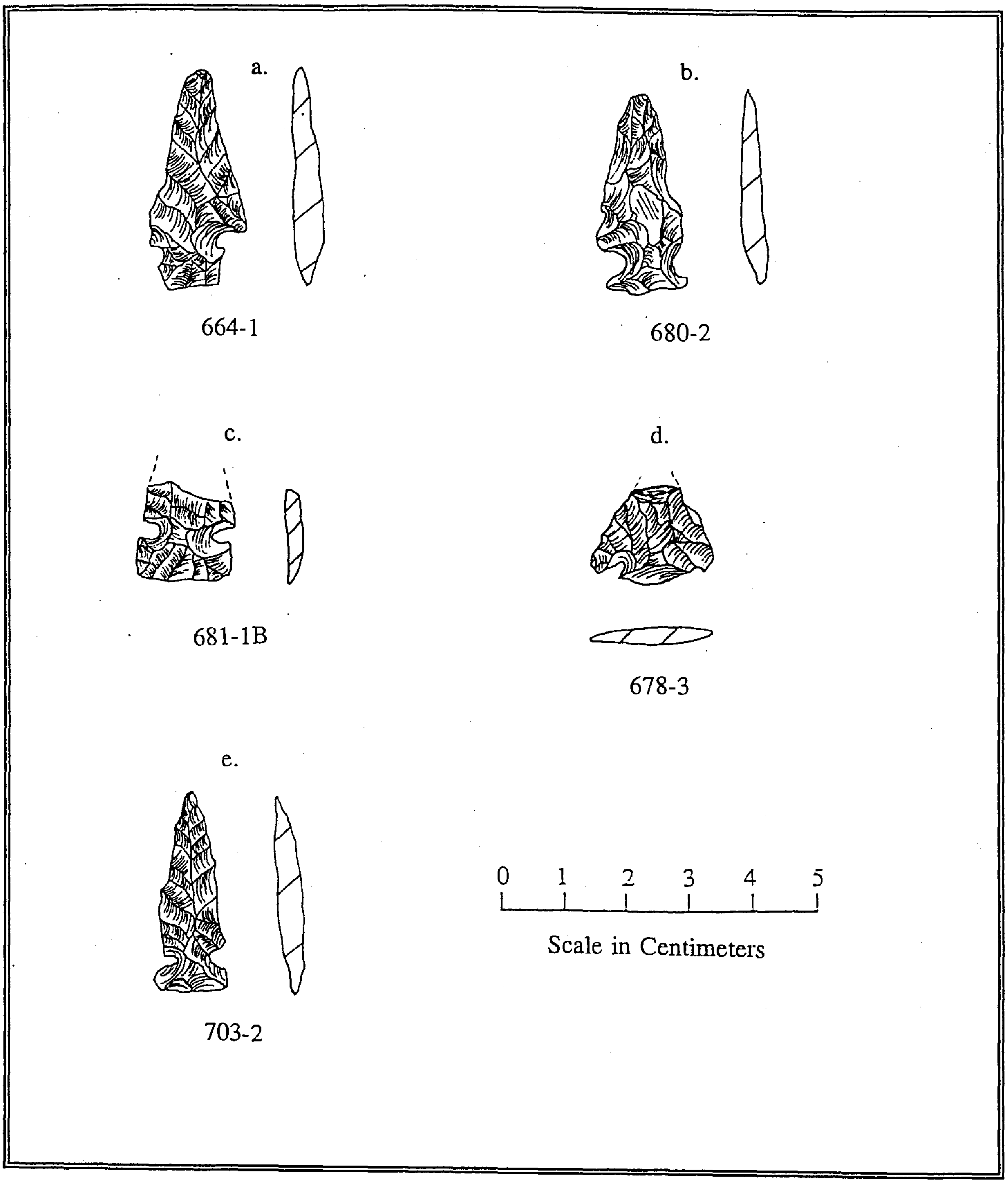


Figure 8: Clikapudi, Notched, and Siskiyou Side-Notched Projectile Points

4. Clikapudi Notched Series Obsidian (6); (Figure 7c - 7e and 8a - 8d)

Clikapudi Notched Series points have been named after artifacts recovered from a group of sites in the vicinity of Redding, in Shasta County (Basgall and Hildebrandt 1989:132). This series includes non-Gunther, notched points found within the Sacramento River Canyon, and accommodates a wide range of sizes and shapes. For operational purposes, Basgall and Hildebrandt (1989:133) distinguish between Clikapudi Side and Corner Notched variants on the basis of the proximal shoulder angles (PSA). Thus, points with PSA values of less than 150 degrees define the corner notched varieties, while all non-Gunther notched points having PSA values greater than 150 degrees are identified as Clikapudi Side-Notched variants, rather than Desert Side-Notched series points.

On the basis of data gathered as a result of the Interstate 5 investigation, Basgall and Hildebrandt have suggested that Clikapudi Notched Series points appear to be pre-Gunther in age (1989:144). Distributional data from archaeological sites within the Sacramento River Canyon indicate that both side- and corner-notched variants co-occur in "middle" phase deposits and as a temporally diagnostic group can be placed between ca. 3000 to 2000 years ago or earlier and extending up to A.D. 500 or later (Basgall and Hildebrandt 1989:144). Basgall and Hildebrandt note, however, that the side-notched forms may be more prevalent in the early part of this span.

A total of eight obsidian specimens from this collection can be assigned to the Clikapudi Notched Series on the basis of morphological characteristics. These specimens represent 22 percent of the sample which was recovered at Shasta Valley. Seven of the specimens can be further defined as Side-Notched variants (814, 678-1, 664-1, 680-2, 681-1b, 703-1, 662-1), while one can be assigned to the Corner-Notched subtype (678-3).

The seven Side-Notched specimens are all medium sized and triangular in outline. They possess shallow notches, relatively low along the blade margins, and are relatively slender in relation to their length. The lateral blade margins vary from straight to slightly concave, with one specimen (678-1; Figure 7e) exhibiting serrations along one of its blades. The bases vary from slightly concave to straight and the PSA values on all seven specimens are greater than 150 degrees. Obsidian studies performed on four of the seven specimens reveal these four specimens (678-1, 664-1, 680-2, 703-1) were fashioned from obsidian derived from the GG and/or in one instance (680-2) from GF/LIW/RS geochemical source in the Medicine Lake Highlands. Obsidian hydration rim readings on these specimens range from no visible hydration band on one specimen (664-1) to 2.3 microns (680-2), 5.2 microns (678-1) and 5.4 (703-1) microns.

The remaining specimen that can be assigned to this series is also medium in size, thin in cross section, and triangular in outline (678-3; Figure 8d). The specimen is fashioned from obsidian and has straight lateral blade margins and a moderately expanding stem. The PSA value on this specimen is 90 degrees while the DSA values is 152 degrees.

5. Siskiyou Side-Notched Series Obsidian (1); (Figure 8e)

Siskiyou Side-Notched Series points were originally defined by Mack (1982) and include narrow side-notched points, with straight to concave bases and U-shaped notches, possessing maximum widths of less than 17.5 mm. Based upon Mack's work in the upper Klamath River Canyon, the distinguishing characteristics of this series is based on the fact that these points are "consistently smaller than the Northern Side-Notched and larger than the Desert Side-Notched" points (Mack 1982:275). Mack (1982) utilizes a basal width/neck width ratio to achieve a separation between all three types. Thus, using Mack's scheme, side-notched points possessing basal width/neck width ratios of 1.2 - 2.8 (mean=1.6) would be characterized as Desert Side-Notched series points, while the basal width/neck width ratio of Northern Side-Notched series points would range between 1.5 - 2.7 (mean = 2.0). The ratio of basal width/neck width of Siskiyou Side-Notched series points would range between 2.0 - 2.5 (mean = 2.2) and possess maximum widths of less than 17.5 mm. One obsidian specimen (703-2), representing 2.7 percent of the projectile points from the Shasta Valley collection, is included within this descriptive category. This triangular shaped, narrow point possesses slightly convex lateral blade margins and has a maximum width of 12.5mm. The notches on this specimen are "U" shaped and the base is straight. The basal width/neck width ratio is 2.27 and the PSA is 153 degrees. Unfortunately, the temporal sequence for this point type has yet to be refined. However, it appears that this series pre-dates A.D. 1100 (Sampson 1985:320). Obsidian rim hydration measurements obtained on this visually sourced GG specimen average 5.3 microns.

6. Squaw Creek Contracting Stem Obsidian (1); (Figure 9a)

The Squaw Creek Contracting Stem Series points were proposed by Basgall and Hildebrandt to include medium to large points with developed shoulders and contracting, generally rounded stems (1989:149). Basgall and Hildebrandt recognized two forms: barbed variants, having DSA measurements of less than 190 degrees, as well as shoulders that terminate in distinct tangs that extend beyond the body of the point, and shouldered variants, with definite stems, indistinct barbs, and DSA measurements over 190 degrees (1989:149). A residual class contains those specimens with shoulders too fragmentary to characterize reliably. Although the chronological sequence of this series is still being developed, it appears that this point type is associated with the time period between 4000 to 2000 B.P.

One obsidian specimen (693-3), representing 2.7 percent of the total sample, was recovered from surface deposits. This specimen is medium to large in size, thick in cross-section, and possesses convex lateral blade margins. The specimen is stemmed and has a slightly converging/contracting stem with rounded base.

7. Gunther Barbed Series Obsidian (7), Chalcedony (1);(Figure 9b - 9e and 10a - 10c)

Gunther Series points were originally defined by Treganza (1958) to describe small, triangular-shaped points, possessing corner- or basal notching and barbed distal shoulders.

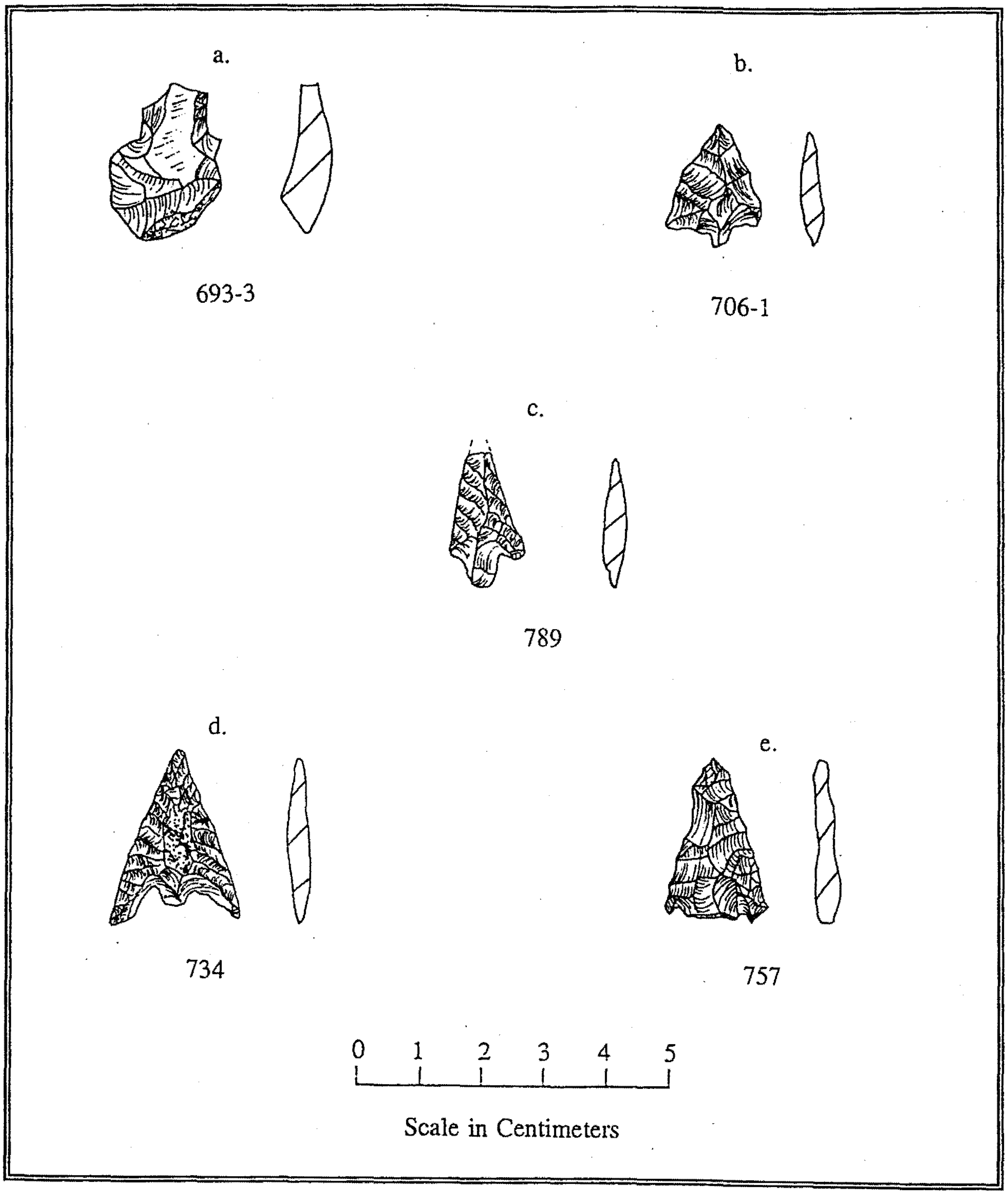


Figure 9: Squaw Creek Contracting Stem Projectile Points

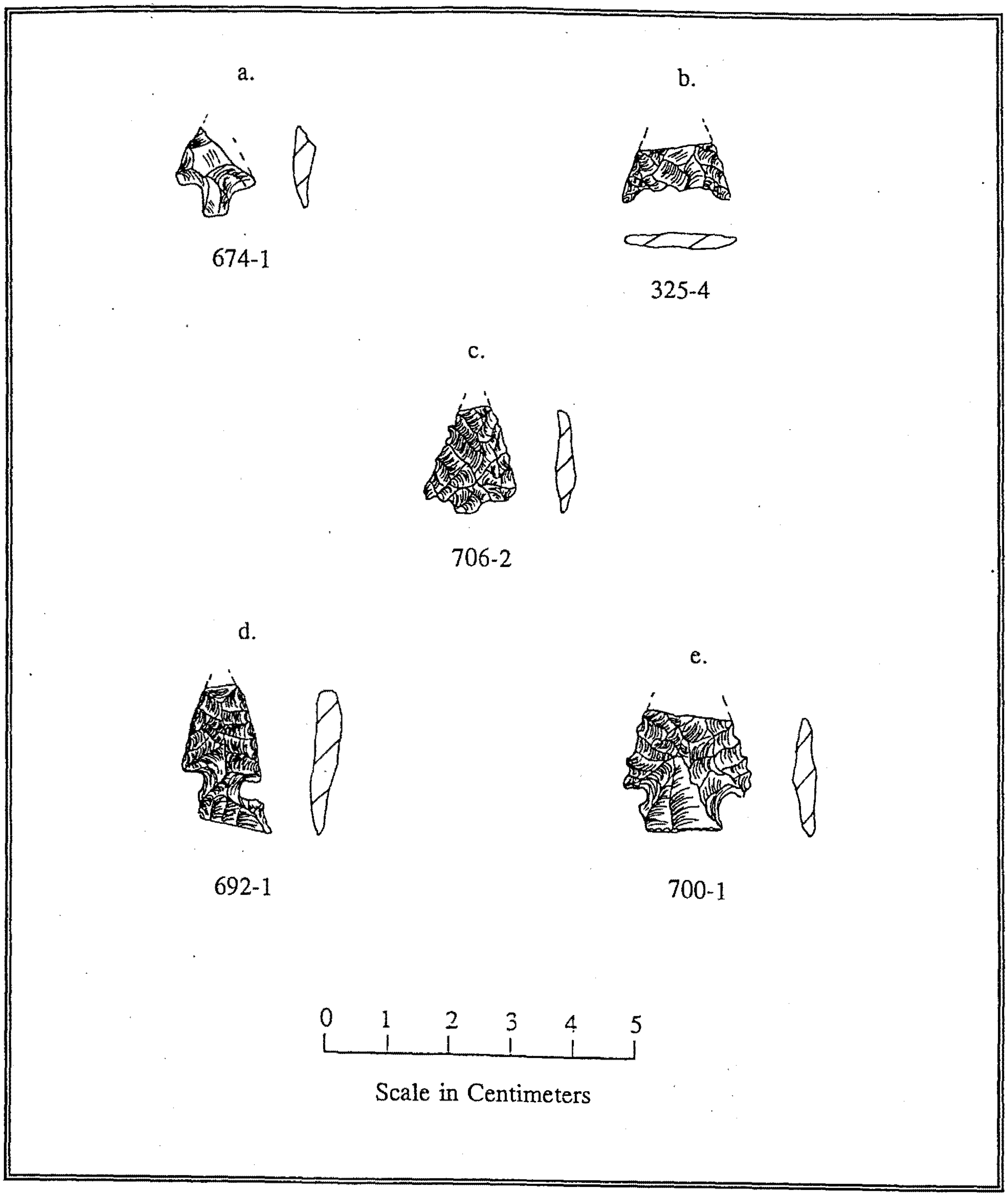


Figure 10: Gunther Barbed, Desert Side-Notched, and Misc. Corner-Notched Projectile Points

While the "classic" Gunther form contains tangs of exaggerated length and a short, tapering stem, other varieties have been observed by various researchers (Basgall and Hildebrandt 1989; Kelly et al. 1987). On the basis of stem morphology, four subtypes, three of which are represented in the Shasta Valley collection, can be identified. These include: (1) Gunther Barbed Contracting Stem; (2) Gunther Barbed Expanding Stem; (3) Gunther Barbed Parallel (or Straight) Stem; and (4) Gunther Barbed General (Kelly et al. 1987:179). This latter category includes fragmentary specimens which lack the necessary morphological characteristics to place them in one of the other three categories.

As noted by Kelly et al. (1987:178), Gunther Barbed series projectile points have been regarded as effective time markers of late prehistoric (ca. A.D. 300 to A.D. 1850) contexts in northern California. One hypothesis has the Gunther Series points introduced into California from the Basin-Plateau region to the north and northeast as a result of the entry of Penutian speaking peoples into the region (Whistler 1977). However, this hypothesis may be in dispute since recent work conducted by Richard Levy (personal communication 1996) suggests that the Penutians came to California from the Great Basin around 4000 to 5000 years ago. Although it is generally accepted that Gunther Series points are late period time-markers, there is some uncertainty as to their entry into northern California. Baumhoff (1985) has suggested a beginning date of approximately A.D. 650 for the northern extent of their range. However, recent evidence suggests that the series may have been introduced into the northern Sierra Nevada and northern California areas as early as ca. A.D. 300 (Hughes 1983; Nilsson et al. 1989). For the purposes of this report, a time span of A.D. 300 to historic times has been adopted.

Eight complete and/or nearly complete specimens, comprising 22 percent of the Shasta Valley collection, have morphological similarities to Gunther series projectile points (674-1, 678-2, 325-4, 706-1, 706-2, 830, 789, 734, 757). All eight specimens are small to medium in size, triangular in shape, and seven of the eight specimens possess shoulders which are either slightly barbed or equal to the stem length. The blades on all eight specimens possess serrations which are shallow and regularly spaced. On the basis of stem morphology, three of the eight recovered specimens can be categorized within the Gunther Barbed Contracting Stem subtype (674-1, 830, 706-1) while three of the specimens can be classified as Gunther Barbed General subtype (706-2, 325-4, 757). One of the specimens (734) would fit into the "classic" Gunther form as originally noted by Treganza on the basis of its exaggerated tangs. The remaining specimen (674-1) can be included within the Gunther Barbed Parallel Sided-Stem subtype on the basis of its morphological characteristics. Obsidian hydration rim readings obtained on three of the specimens are 2.6 microns (706-2), 3.1 (325-4), and 3.8 microns (674-1).

<u>*8. Desert Side-Notched Series* Obsidian (1); (Figure 10d)</u>

Desert Side-Notched projectile points were originally defined by Baumhoff (1957:10) to describe a small, triangular arrow point that possessed small side notches. This series was further characterized by Baumhoff and Byrne (1959) to include four distinct subtypes: (1)

General - possessing a wide range of morphologies, non-descript notching, and concave bases; (2) Sierra - possessing deeply indented basal notches; (3) Delta - possessing V-shaped basal concavities; and (4) Redding - possessing bell-shaped bases and comma shaped notches.

The Desert Side-Notched series is a common style found in late prehistoric and historic times over a wide ranging region of the more arid portions of the western North America from Mexico to the northern Plains. It has been suggested that this series appeared sometime after A.D. 1100 to 1200 and continued into the historic era where they were manufactured by Great Basin ethnographic groups (Heizer and Hester 1978). Baumhoff and Byrne (1959) have discussed the temporal utility and distribution of three of the four subtypes and have proposed the following sequence for their introduction into northern California. They postulate that the General subtype arrived in the northern Sierra Nevada region by A.D. 1500, and the northern Sacramento Valley by A.D. 1600. The Sierra subtype also arrived in the northern Sierra Nevada region by A.D. 1500, and subsequently into northeastern California by A.D. 1600. The Redding subtype, which is more geographically restricted, did not arrive into the northern Sacramento Valley until A.D. 1700.

One obsidian specimen (692-1), comprising 2.7 percent of the collection, was recovered from Shasta Valley. The specimen is small and triangular in shape with side notches along the lower margins of the blade. On the basis of its blade morphology, which is slightly concave, it has been categorized as a General subtype. This specimen was fashioned from GG obsidian and possesses an obsidian hydration rim reading of 3.1 microns.

9. Miscellaneous Corner-Notched Points Obsidian (3); (Figures 10e and 11a)

Three incomplete corner-notched points (700-1, 678-2, 700-3) were recovered from the Shasta Valley. All three specimens are large to medium in size and triangular in outline. Two of the three specimens possess straight lateral blade margins that are serrated. Specimen 700-1 (Figure 10e) possesses some general resemblance to Elko Corner-Notched points and has an obsidian hydration rim reading of 5.0 microns. Despite the general resemblances, however, this specimen cannot be confidently placed into this existing typology because of its fragmentary condition. Specimen 678-2 (Figure 11a) represents the mid-portion of what was once an originally much larger specimen. The specimen is large and triangular in outline and has slightly convex lateral blade margins. An obsidian hydration rim reading of 5.5 microns was obtained on this specimen. The remaining specimen (700-3) represents the basal element of a larger piece. It has a straight base and there are slight indentations above the basal elements which are low on the blade. Due to its fragmentary condition, it cannot be confidently placed into any existing typology. These specimens represent 8.0 percent of the collection.

10. Miscellaneous Side-Notched Points Obsidian (8);(Figure 11b-11c and 12a-12b)

This group is comprised of six large to medium sized (325-1, 663-2, 700-2, 703-3, 673-1, 697-1) and two small (325-2, 668-2) sized, side-notched points whose fragmentary conditions

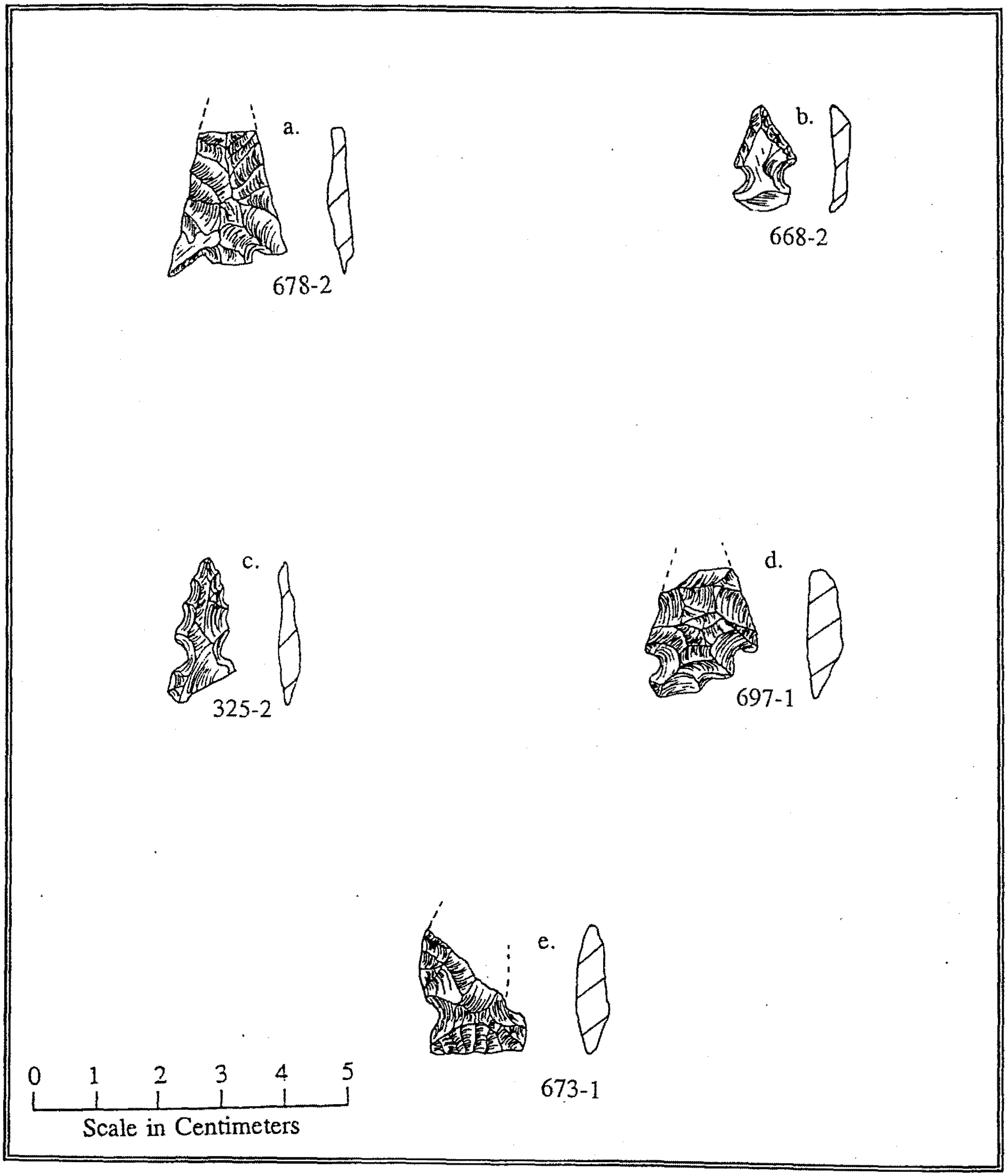
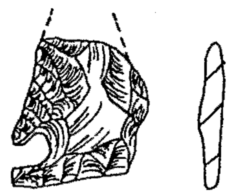


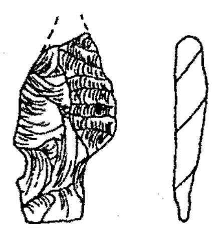
Figure 11: Misc. Corner-Notched and Side-Notched Projectile Points

a.

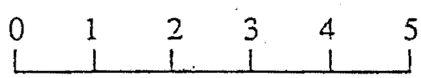


325-1

b.



703-3



Scale in Centimeters

Figure 12: Misc. Side-Notched Projectile Points

do not easily allow their placement into other types such as Northern Side-Notched (Gruhn 1961), Desert Side-Notched (Baumhoff and Byrne 1959), Clikapudi Side-Notched (Basgall and Hildebrandt 1989), and/or Siskiyou Side-Notched series (Mack 1982). Due to their fragmentary condition, they have been placed within the general category of Side-Notched points. These specimens represent 22 percent of the total projectile point assemblage collected from Shasta Valley. The two smaller specimens (325-2, 668-2) represent fragments which appear to have been reworked from what was originally a much larger specimen into smaller side-notched points. Obsidian hydration rim readings also support this contention, as they range from 5.2 to 7.4 microns, respectively. The remaining six specimens are incomplete and lack their distal portions. The lateral blade margins, when present, range from straight to convex to slightly concave and the stems vary from straight to slightly concave.

Of the four specimens submitted for obsidian studies, two were fashioned from obsidian deriving from the GG geochemical group (673-1, 703-3), while two were fashioned of GF/LIW/RS obsidian (325-1, 697-1). Obsidian hydration rim readings obtained on these same specimens were unreadable in one case due to a diffuse front (673-1) and in the remaining three cases were 5.1 (697-1), 6.0 (325-1), and 6.8 (703-3) microns.

11. Unidentifiable Point Fragments Obsidian (5)

Five fragmentary obsidian projectile point specimens were recovered during the investigations within Shasta Valley. Specimens 679-2 and 331-la consist of the distal tips of originally much larger pieces. Specimens 680-hAl, 695-1, and 688-1 represent mid-section portions. Unfortunately, none of these specimens can be confidently assigned to a specific type due to their fragmentary condition.

Projectile Point Discussion

Of the 42 projectile points that were recovered during the Shasta Valley inventory project, approximately 70 percent could be confidently assigned to specific types on the basis of morphological characteristics. The remaining side- and corner-notched point types from Shasta Valley are too fragmentary and/or do not have clear counterparts that have been securely dated. Furthermore, the re-working of points was most likely a contributor to the morphological variability which is seen.

Since all the projectile points were recovered from surface contexts, little can be said regarding the specific occupational history of the study area beyond the fact that at least this portion of Shasta Valley appears to have been utilized over a long temporal range. Aside from a questionable biface that remotely resembles a stemmed point, recovered projectile points include types that range from Early Archaic times to contact. Following the chronological sequence developed by Elston (1986) for the western Great Basin, the Early Archaic is considered to span the time period from approximately 5000 B.C. to 2000 B.C. while the Middle Archaic spans the period of time between 2000 B.C. to A.D. 500. The Late

Archaic is thought to date from A.D. 500 until the historic era, A.D. 1850s. Some scholars place the latest prehistoric times into an Emergent period or provide another designation.

Because of known collecting in the region, it is difficult to judge the overall representation by reported numbers of projectile point types. Spacing during survey also no doubt limited total recovery of all surface projectile points in the parcels. However, based on obsidian hydration rim readings from both projectile points and debitage, the diversity of types represented in this zone appears nearly complete. Approximately 8 percent (n=3) of the points recovered appear to date from 5000 B.C. to 1000 B.C. and may have been associated with the Early Archaic. The remainder, and bulk of the assemblage, contains specimens which fall between the range of 2000 B.C. to A.D. 500 (n=13; 59.3 percent), and from A.D. 500 to historic times (n=10; 32.7 percent). Based on these data, it appears that the Shasta Valley area was occupied most intensively during the Middle to Late Archaic, with occupation occurring, albeit at a lesser intensity, during the Early Archaic. We temper this assessment with a realization that erosional/depositional factors over time would probably lead to the obscuration of older sites and isolates and variation in projectile-related behavior may apply.

Biface Analysis

Bifaces, as described here, encompass those specimens which exhibit flake removal from both dorsal and ventral surfaces with the exclusion of projectile points and drills. Techniques for the manufacture of bifaces included both percussion and/or pressure flaking. Generally, bifaces have been regarded as a catch-all category which includes deliberately shaped bifacial tools that do not fit well into other identifiable flaked stone tool categories, such as projectile points, drills, or knives (Nilsson 1985a). However, the relatively high-energy investment in a bifacial tool indicates that it is not to be discarded quickly and that its shape is important to its role (Kelly 1988:718). Consequently, it is as a direct result of such issues as those presented above that some researchers have noted that the presence of bifaces in tool assemblages in archaeological sites has given rise to a variety of interpretative problems (Dreyer and Kowta 1986:83; see also Kelly 1988).

As concluded by Kelly (1988:719), bifaces can be manufactured to play one or more of three different organizational roles in a hunter-gatherer lithic technology.

1. Large bifaces may be used as cores as well as tools. Since each flake from a biface has a high edge-to-weight ratio (Goodyear 1979), more usable flake edges can be produced from a biface than from a percussion core of similar weight.

2. Bifaces can serve as long use-life tools, in which a tool's bifacialness is necessary to its anticipated role, which is to be resharpenable and usable for its function even if broken.

3. Finally, bifaces can be manufactured for use as a shaped, or functioned-specific tool which is part of a reliable technology, for example as a knife or blade.

Kelly (1988:731) has suggested that use of a biface in each of these roles is related to a combination of raw-material distribution and a group's mobility strategy. Therefore, the use of bifacial implements in different roles has implications for the distributions of and associations among different classes of the remains of biface manufacture and use at a prehistoric site (Kelly 1988:731).

A total of 33 bifaces was recovered from Shasta Valley. The provenience and selected attribute data for bifaces are presented in Table 5. Although the majority of the specimens recovered are fragmentary in nature and the assemblage is small, it is still possible to discuss certain observations concerning the biface assemblage. Approximately 88 percent of the bifaces are fashioned from obsidian, with the remainder being composed of cryptocrystalline silicates. The predominance of obsidian bifaces, a pattern well-noted within this region, only serves to underscore the multiple use-life of these artifacts for both flake and tool production.

The bifaces discussed below were placed into one of five categories according to the following criteria developed by Nilsson (1988:31) : 1) amount of remnant cortex; 2) thickness of cross-section; 3) degree of edge sinuation; 4) degree of outline symmetry; 5) application of pressure retouch; 6) extent of flaking; and 7) hafting. The collection of bifaces from Shasta Valley is dominated by late stage biface reduction for obsidian and early stage for cryptocrystalline silicates. When examined in conjunction with the debitage assemblage, these data suggest that obsidian bifaces arrived at the site in a nearly final form, while cryptocrystalline bifaces were being manufactured on site from local materials.

1. Bifaces - Stage 1 Obsidian (1); Cryptocrystalline (3); (Figure 13a)

A total of four bifaces, one of obsidian and three of cryptocrystalline silicate, typify this "roughout" category. All four specimens are thick in cross-section and have sinuous edges. There is retention of cortex on all three of the cryptocrystalline specimens, while the obsidian specimen appears to have originated from a flake blank. Stage 1 bifaces represent approximately 12 percent of the total assemblage recovered from Shasta Valley.

2. Bifaces - Stage 2 Obsidian (2); (Figures 13b-c)

This category contains those specimens which appear to represent the initial shaping of the artifact. Both specimens are fashioned from obsidian and the flaking patterns are oblique in orientation. The specimens are roughly symmetrical in outline with the appearance of tip and basal elements. There is no evidence of pressure flaking on these specimens. Stage 2 bifaces represent approximately 6 percent of the total assemblage from Shasta Valley.

Table 5. Selected Attribute and Provenience Data of Bifaces.

Accession Number	Material	Wt. (gm)	L (cm)	W (cm)	T (cm)	Stage
681-2b	OBS	1.3	3.2	1.1	.4	4
703-4	OBS	.9	3.1	.7	.5	5
242-5	OBS	1.6	3.4	2.1	.8	1
242-4	CCS	2.1	4.3	2.3	2.1	1
692-3	OBS	2.7	3.0	1.8	.6	2
693-4	OBS	1.0	1.6	1.5	.4	5
693-2	OBS	2.2	2.35	1.4	.5	4
697-6	CCS	23.6	5.6	2.8	1.4	1
662-2	OBS	5.0	3.2	2.4	.7	5
678-4	OBS	4.7	3.7	2.0	.7	4
665-1	OBS	6.4	3.25	2.5	.9	1
665-2	OBS	.6	-	-	-	UNID
679-4	OBS	2.2	2.25	2.65	.45	3
679-1	OBS	.8	1.4	1.65	.3	5
680-8	OBS	1.95	1.4	1.65	.8	5
680-10B	CCS	.5	1.1	1.0	.5	5
680-3	OBS	.8	2.25	1.25	.4	5
328-6	OBS	.6	1.0	1.8	.3	5
696-5	OBS	6.0	3.35	2.0	1.1	2
696-3	OBS	1.5	2.25	2.0	.8	3
696-4	OBS	2.7	2.0	1.8	.6	5
705-8	OBS	.75	2.0	1.6	.25	5
786	OBS	4.9	4.2	1.9	1.3	5
756	OBS	2.7	2.6	1.6	.7	5
700-5	OBS	2.7	2.7	2.6	.35	4
692-2	OBS	5.5	3.5	2.0	.8	3

Table 5. Continued.

Accession Number	Material	Wt. (gm)	L (cm)	W (cm)	T (cm)	Stage
680-4	OBS	-	3.2	1.6	.6	5
680-1	OBS	-	3.5	1.3	.6	5
805	OBS	2.6	3.2	2.1	.5	5
758	OBS	1.6	2.7	1.6	.4	4
831	OBS	1.0	1.2	1.4	.5	5
749	OBS	6.7	5.1	2.1	.7	5
834	OBS	.7	1.7	1.3	.4	5

KEY

OBS - obsidian
CCS - cryptocrystalline silicates
Wt. - weight in grams
L - length in centimeters
W - width in centimeters
T - thickness in centimeters

3. Bifaces - Stage 3 Obsidian (3); (Figures 14a-c)

Three obsidian bifaces (9 percent) from the Shasta Valley collection exhibit a focus on thinning and shaping. The margins of two out of the three specimens are generally straight and excurvate. The flake scars on all three specimens are broad, expanding and are diagonally patterned. As noted by Nilsson (1988), Stage 3 bifaces are considered to be a preform in the blank-preform-product continuum. An obsidian hydration rim reading of 5.6 microns was obtained on specimen 692-2.

4. Bifaces - Stage 4 Obsidian (5); (Figures 15a-d)

Partially reduced by pressure flaking, a total of five obsidian specimens are included within this category. All five specimens are symmetrical in shaped and generally leaf-shaped in outline. Pressure flaking, concerned with producing regular, straight edges, is evident on all five specimens. Stage 4 bifaces represent 15 percent of the total assemblage recovered from Shasta Valley. An obsidian hydration rim reading of 3.1 microns was obtained on specimen 681-2a.

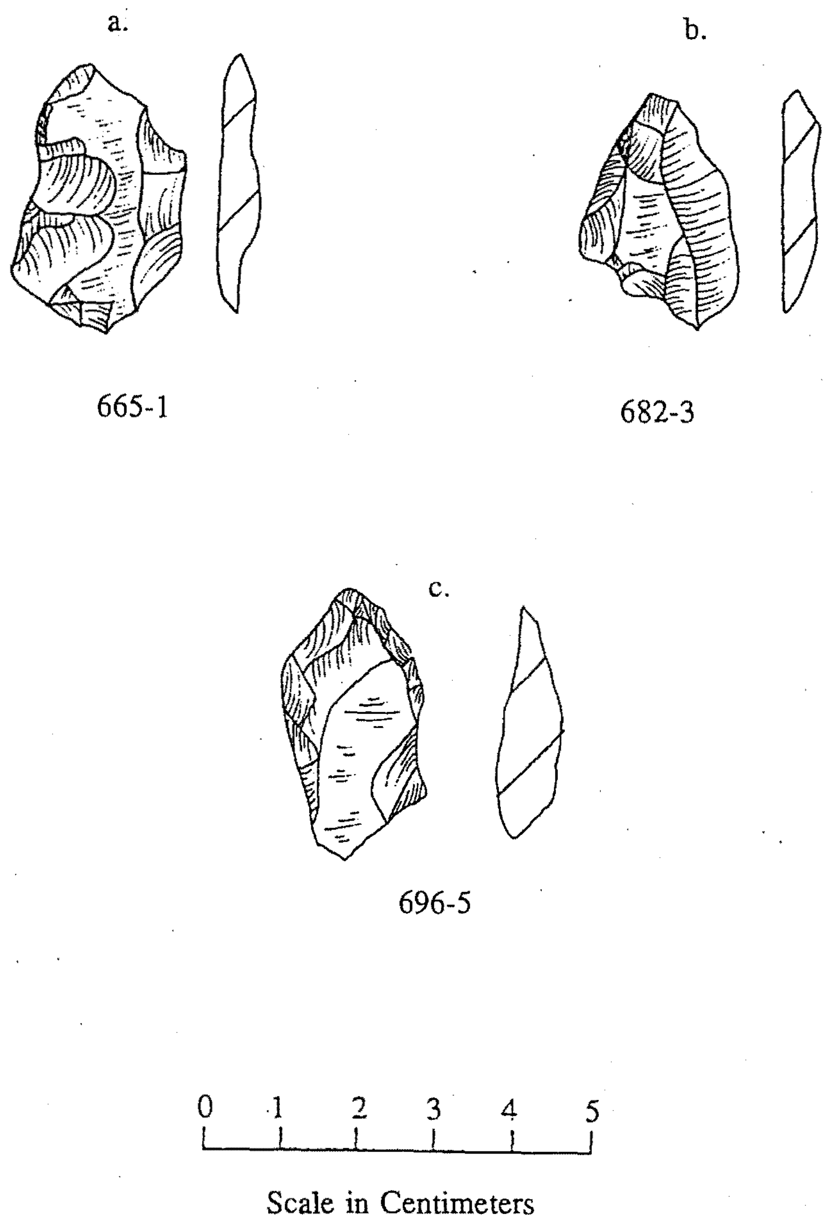


Figure 13: Stage 3 Bifaces

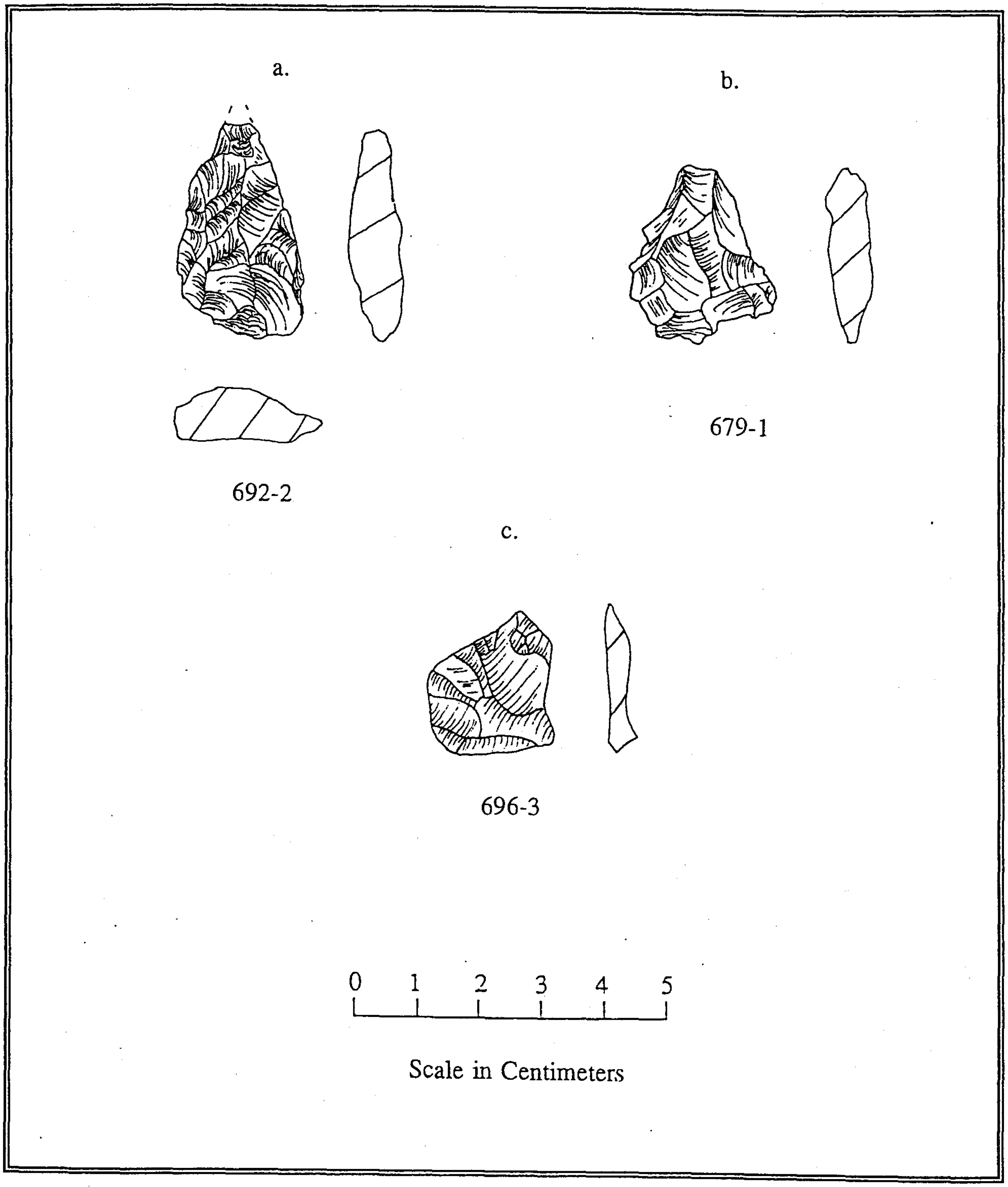


Figure 14: Stage 3 Bifaces

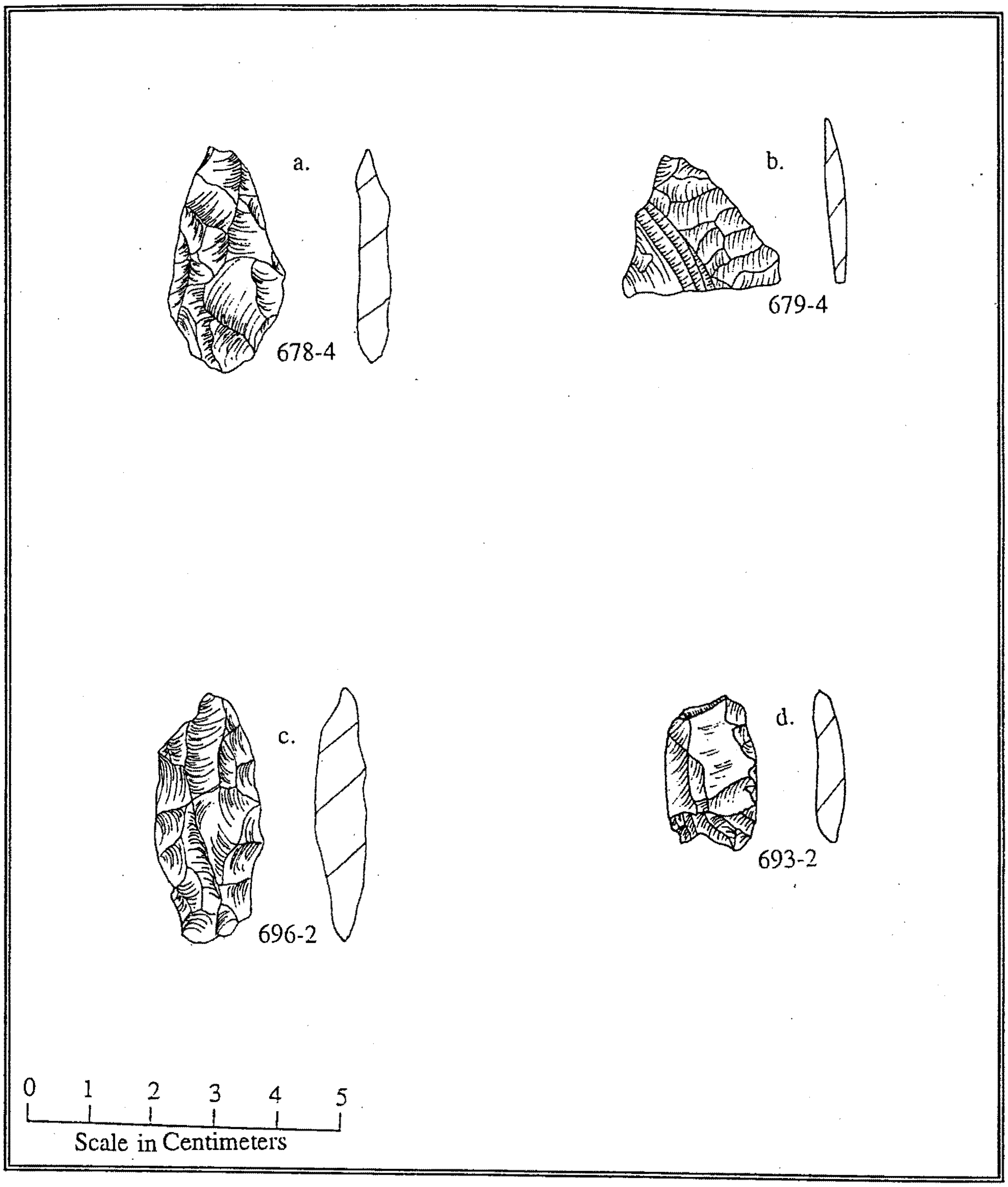


Figure 15: Stage 4 Bifaces

5. Bifaces - Stage 5 Obsidian (17); Cryptocrystalline (1); (Figure 16a-h)

The largest group of Shasta Valley bifaces (n=18) consists of specimens which are categorized as Stage 5 bifaces. These specimens represent 55 percent of the total assemblage recovered from Shasta Valley. Extensive pressure flaking resulting from final shaping is evident on all five specimens which appear to represent final or near final forms. Obsidian hydration rim readings are 3.8 (680-10b), 2.8 (680-4), and 2.6 microns (680-1).

Biface Discussion

Obsidian bifaces are evident throughout the entire biface reduction trajectory as categorized by Nilsson (1988). Based on the paucity of obsidian cores, coupled with the near absence of primary core reduction obsidian debitage exhibiting cortex, it appears that the obsidian bifaces were arriving in the valley in pre-reduced forms being transported into Shasta Valley directly from the quarry and/or some intermediate location. The collection as a whole is dominated by end or final stage reduction techniques. Bifaces of cryptocrystalline silicates, although few in number (n=4, 12 percent), are found in early and late stage forms. Based on these data, it appears that obsidian was preferred over the local materials for biface production/reduction. As noted below, the debitage analysis supports biface reduction activities at a number of sites.

Lithic Technology and Obsidian Studies

Recent studies (Goodyear 1979; Kelly 1983; Shackley 1986, 1987) have demonstrated that an assessment of patterning in debitage may reveal activities related to site function and logistic use that are not apparent through observation of formal tool types. Flaked stone passes through a reduction sequence from unmodified material to finished artifacts. During this reduction sequence, debitage is produced that possesses distinctive characteristics indicative of the stage of reduction and/or the nature of the intended product. In addition to flake characteristics, size is generally considered to be an attribute important to the understanding of variability in the lithic waste materials. Primary core reduction and flake manufacture will tend to produce a higher frequency of large waste materials as greater force is usually applied during this stage than in later, subsequent stages of tool manufacturing (Dreyer and Kowta 1986). The primary reduction of cores is typically carried out by means of hard hammer percussion techniques, whereas soft hammer percussion techniques are employed in the subsequent thinning and reduction of large flakes and bifaces, resulting in the production of small waste materials.

In addition to the size difference of waste materials, the frequency of debitage containing cortex can be used to differentiate between primary core reduction and final tool manufacture (Dreyer and Kowta 1986). It has been suggested that a preponderance of original cortical material on the debitage suggests primary reduction and possibly proximity to sources, whereas a general lack of cortical material on flakes may suggest extensive and intensive

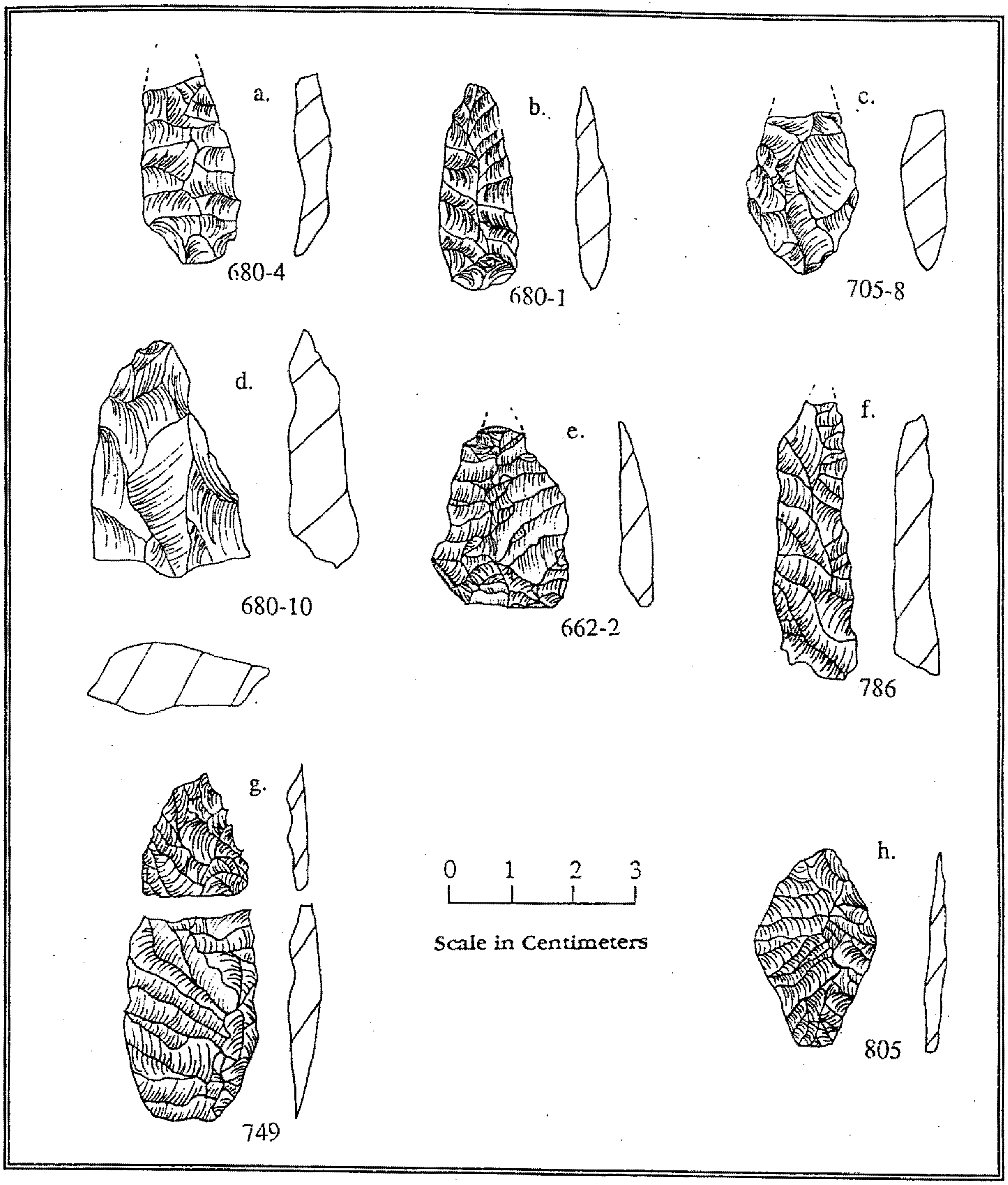


Figure 16: Stage 5 Bifaces

reduction and production or rejuvenation of tools (Shackley 1987:45). However, it has been argued (Sullivan and Rozen 1985; Skinner, Fagan and Ainsworth 1989) that the proportion of debitage with cortex in an assemblage can be affected by other factors, such as raw material type, core size and shape, physical characteristics of raw material, stylistic and/or functional approaches, and regional procurement and reduction systems. Nevertheless, a general tendency would still exist to produce larger amounts of debitage with cortex in the initial stages of core reduction and primary flake production than in later reduction sequences.

There are other variables that also may affect the size of waste materials produced, such as the initial size and shape of cores; however, it may be generally inferred that assemblages containing large quantities of small pressure flakes indicate later phases of tool production and rejuvenation, whereas larger quantities of large waste materials indicate the primary reduction of cores and/or manufacture of flake blanks or tools. Therefore, areas or sites containing high percentages of waste materials with cortex should represent primary core reduction stations, whereas areas with high percentages of waste flakes without cortex should represent secondary reduction and tool manufacturing stations.

All debitage recovered from the investigation, totaling 1265 individual items, was subjected to a detailed technological analysis. The initial stage of lithic analysis consisted of sorting the debitage by size and material type within each unit. Four size classes were established for this initial lab procedure: large - greater than 12.7 mm; medium - between 12.7 and 6.7 mm; small - between 6.7 mm and 3.3 mm; and micro - smaller than 3.3 mm. The second phase of lithic analysis involved the sorting of debitage material into one of the fifteen technological or morphological categories defined in Hamusek et. al. (1996). Of the 1265 pieces of obsidian debitage recovered from the investigation, 773 items could be confidently assigned; the remaining 492 specimens represented unidentified flake fragments. This trend was generally across the board. Thus, the following discussion is based primarily upon data generated from 61 percent of the sample (at eighteen of the sites field observations were made of debitage types).

Analysis of the data presented in Table 6 indicates that while the expression of flaked stone technology may vary slightly between the different sites, debitage occurs within each of the prehistoric site deposits and includes local cryptocrystalline silicates and chalcedony as well as exotic materials such as obsidian. Although basalt occurs in this foothill/mountain region in flows, plugs and as stream float, "artifact-quality" basalt was not found during the inventory in surveyed parcels. Since we were not able to examine the quality of regional basalts to compare with basalts found at documented sites it is unknown at this point in time whether the basalt debitage and artifacts was derived from local or more regional source material. Obsidian is the most dominant lithic material found at both residential as well as lithic scatter sites. Of all debitage analyzed, obsidian comprises 59 percent of the lithics, while 28 percent consisted of cryptocrystalline silicates. Locally occurring chalcedony and basalt were also evident, albeit in lesser amounts (6 percent and 7 percent respectively).

Table 6: Summary of Lithic Analysis Results from Shasta Valley Inventory.

Site #	Site type	Early Biface	Middle Biface	Late Biface	Final tool	Initial Core	Late Core	Material Types
700	TC	+	+	+	+	+	-	E/L
706	OCC	+	+	+	+	+	-	E/L
711	OCC	-	+	+	+	-	-	E
668	OCC	+	+	+	+	+	-	E
680	OCC	+	+	+	+	+	+	E/L
690	TC	+	+	-	-	-	-	E
692	TC	+	+	+	+	-	-	E/L
673	LS	+	+	+	+	+	-	E
674	LS	+	+	-	+	+	-	E/L
675	LS	-	-	+	+	+	-	E/L
679	LS	-	+	+	-	+	-	E/L
242	LS	+	+	-	-	-	+	L
325	LS	-	+	+	+	-	-	E
326	LS	+	+	+	+	-	-	E
328	LS	+	+	+	+	+	-	E/L
329	LS	+	+	+	+	-	-	E
330	LS	+	+	+	-	+	-	E/L
331	LS	-	-	+	+	-	-	E
663	LS	-	-	-	+	-	-	E
664	LS	-	-	-	+	-	-	E
665	LS	-	+	+	+	-	-	E
666	LS	-	+	+	+	-	-	E
667	LS	-	-	-	+	-	-	E
669	LS	+	+	+	+	+	-	E

Table 6: Continued.

Site #	Site type	Early Biface	Middle Biface	Late Biface	Final tool	Initial Core	Late Core	Material Type
693	LS	+	+	+	+	+	-	E/L
695	LS	+	+	-	-	+	-	E/L
696	LS	+	+	+	+	+	-	E/L
692	LS	+	+	+	-	+	-	E/L
698	LS	+	-	-	-	+	-	E/L
699	LS	+	+	+	+	+	-	E/L
702	LS	+	+	-	-	+	+	E/L
703	LS	+	+	+	+	-	+	E/L
705	LS	-	+	+	+	+	-	E/L
709	LS	-	-	-	-	+	-	L
681	LS	+	+	+	+	+	-	E/L
682	LS	+	-	-	-	+	-	L
685	LS	-	-	-	-	+	-	L
686	LS	+	+	+	+	+	-	L
687	LS	-	+	+	+	-	-	E
688	LS	-	-	+	+	-	-	E
671	LS	-	-	-	-	+	-	L

KEY

Early Biface - Early stage biface reduction
Middle Biface - Middle stage biface reduction
Late Biface - Late stage biface reduction
Final tool - Refurbishing and/or shaping and sharpening
Initial Core - Primary and/or initial core reduction
Late Core - Late stage core reduction
E - Exotic toolstone materials include obsidian and basalt
L - Local toolstone materials include chalcedony and cryptocrystalline silicates

LS - Lithic Scatter
OCC - Long term residential
TC - Short term residential

Although various stages of lithic reduction/production sequence are represented at the sites (e.g., core reduction, biface thinning, pressure flaking), it appears that the intensity of these activities is somewhat material dependent. Local toolstones were employed principally for initial and/or primary core reduction and early stage biface thinning and occur less frequently as late stage biface thinning or pressure flakes. Few formed artifacts were found composed of non-obsidian materials. There is a weak tendency for more lithic scatter sites to have a greater emphasis on core reduction techniques than that found in residential sites, but this tendency is not statistically relevant. Clearly, both categories of sites reflect the relative abundance of local non-obsidian toolstone suitable for conchoidal fracture within a few kilometers or so.

In contrast, obsidian debitage occurs as biface thinning flakes, whether it be early, middle or late stage types. Within both residential as well as lithic scatter sites there was a greater emphasis on mid-to late- stage biface manufacture and/or reduction with obsidian materials than with locally occurring chalcedony and cryptocrystalline silicates. Moreover, the predominance of obsidian pressure and notching flakes provides further evidence that the final stages of projectile point manufacturing or, perhaps, retooling was undertaken at approximately 71 percent (n=30) of the sites examined. These data suggest that thinning, resharpening and/or reshaping of bifaces were important activities at nearly all of the sites.

Late stage core reduction activities are only minimally represented at several of the sites examined (n=4, 9.5 percent) where they are found to occur on all material types. The absence of bipolar elements from all raw material types in the Shasta Valley collection is notable because of their presence in site assemblages from the surrounding region (Nilsson 1991). Since bipolar technology is generally regarded as an indicator that the raw material was being utilized intensively, the absence of this technology from the Shasta Valley collection suggests that there was no need to maximize tool stone. The use of relatively large imported flake blanks for further reduction is evident at 17 percent of the sites examined (n=6) suggesting that this technology was occurring.

These patterns of lithic reduction sequences are substantiated among the flaked stone tools. Local materials are found primarily among cores and Stage 1-2 bifaces, while obsidian tools consist overwhelmingly of Stage 3-5 bifaces, edge-modified pieces, and projectile points. Although present, the presence of early stages of lithic reduction or flaked stone tool manufacture from obsidian materials are only represented in limited amounts.

The data indicate that local toolstone materials were being reduced from previously unaltered pieces of parent material such as botryoidal chalcedony crust and cryptocrystalline silicate nodules and, perhaps, basalt cobbles. Obsidian was arriving in the study area in a preformed state as bifacial blanks or large flakes which required only the removal of percussion thinning or pressure flakes for modification. In addition to the reduction of preformed pieces, there is evidence for the reuse or reworking of older obsidian artifacts in the Shasta Valley lithic collection which suggests that scavenging of toolstone from other sites may have served a role in the lithic reduction technological sequence. These data derive from the interpretation of hydration studies as the presence of multiple hydration rim readings on several of the specimens submitted for hydration analysis is present. Our analysis is not fine-tuned enough in terms of dated assemblages to reveal chronological differences in reduction strategies. However, we suspect these various lithic reduction strategies have a long duration.

Obsidian Characterization and Hydration Analyses

One goal of this investigation was to compare the source provenance of obsidian found within Shasta Valley sites with the glass from other nearby sites. In order to achieve this goal, energy dispersive x-ray fluorescence (XRF) analysis was performed at the Obsidian Studies Laboratory of BioSystems Analysis, Inc. on thirty specimens from selected sites. These specimens included both debitage and formed tools.

The obsidian from Shasta Valley is dominated by obsidian which derives from geochemical sources within the Medicine Lake Highlands. Of the thirty specimens subjected to XRF analysis, the data indicate that approximately 97 percent, or all but one, have spectral signatures consistent with those assigned to the Grasshopper Flat/Lost Iron Wells/Red Switchback geochemical source group or the composite group designated as the Grasshopper Group (Grasshopper Flat/Lost Iron Wells/Red Switchback and East Medicine Lake). The remaining specimen (three percent) derives from the Railroad Grade geochemical source, also located within the Medicine Lake Highlands.

Based upon recent research, Craig Skinner (personal communication 1996) has created the Grasshopper Group subtype in order to cover the overlapping ranges of Zr values which exists between Grasshopper Flat/Lost Iron Wells/Red Switchback and East Medicine Lake geochemical source groups. Skinner has observed that when you figure in the analytical uncertainties, it is not possible to distinguish between GF/LIW/RS and EML groups at a 95% confidence level. Based on the analysis of a large sample of geological specimens from all constituent's source localities, Skinner has utilized the data to set the Zr source identity boundaries for these geochemical groups.

In addition to XRF analyses, visual sourcing of the entire debitage collection was undertaken by the senior author. Hughes (1983) describes the obsidian originating from these sources as being milky gray and banded (Grasshopper Flat); gray and black, some with streaks and broad bands (Lost Iron Wells); and/or red and black obsidians (Red Switchback). When examined through translucent light, obsidians from these sources tend to be translucent to semi-translucent and have a pinkish-brown cast. However, it appears that the visual characteristics of obsidian from these source locales may be even greater than previously known since XRF analysis of debitage selected for analysis suggests a greater range of translucency and colors than previously thought. Of the debitage examined, the majority appeared to have originated from the Grasshopper Group geochemical source.

Although the sample size is small, from these data we can posit some preliminary inferences regarding lithic procurement patterns. Based on data obtained as a result of the east Shasta

Valley investigations, there is an overwhelming predominance of obsidian from the nearest obsidian sources located approximately 35 miles distance to the east in the Medicine Lake Highlands. This reliance on obsidian from the nearest source is a procurement pattern which is also witnessed at other regional sites (Mack 1995; Nilsson 1991; see also Hamusek 1993) and is not inconsistent with the Distance - Decay Model developed by Renfrew (1977).

Based upon previous work conducted by Hughes (1983, 1986), it was also hypothesized that there would be a differential preference for obsidian sources over time. Hughes (1983:264-265) noted that in northeastern California, early period sites exhibited obsidian from the nearest sources, while during middle periods the obsidian was from more distant sources, with a return to closer sources during the later period. The data recovered from the Shasta Valley investigation, however, failed to reveal any preferential differences over time or among utilitarian versus possible socio-ceremonial items (e.g., finely made bifaces) for the various obsidian sources. These data suggest that obsidian from the Medicine Lake Highlands was the preferred glass for all artifact classes regardless of the time period involved. To the contrary, within the Klamath River Canyon just to the north, a probable corridor of travel, greater source variation is apparent, varying also with time (Joanne Mack, personal communication 1996).

In an effort to evaluate stratigraphic integrity at the sites and provide data regarding diachronic change and chronology, an additional 37 specimens were submitted for hydration band measurement to Biosystems Analysis, Inc. (total submitted n=67; see Appendices in Haumusek et al. for 1996 obsidian characterization and hydration results).

A review of the hydration data for the site reveals some intriguing patterns. First, the hydration rim readings for specimens analyzed range from a low of no visible band (nvb) to 9.7 microns on a piece of debitage recovered from the surface. Approximately 15 percent (n=10) of the specimens analyzed either did not reveal a visible hydration band or the hydration band was unreadable for various reasons.

The overall mean was 4.82 microns with the overall standard deviation 1.52 microns. As shown in Figure 17, a band of readings of the range of these data shows two distinct hydration clusters. Sampling problems aside, the earliest cluster occurs at 4.5 to 6.5 microns and then a later one occurs at 2.5 to 3.5 microns. These data tentatively suggest that there have been two periods of intensive occupation or pulses of human activity that occurred within Shasta Valley, with the first, or earliest one, starting at 6.5 microns and reaching a peak of activity at 5.0 microns before declining. The second, or most recent pulse, appears to have begun at 4.0 microns at which point there was a steady increase until a peak of activity was again reached at 3.0 microns. Moreover, this second, most recent peak appears to have been of lesser intensity than the earlier peak.

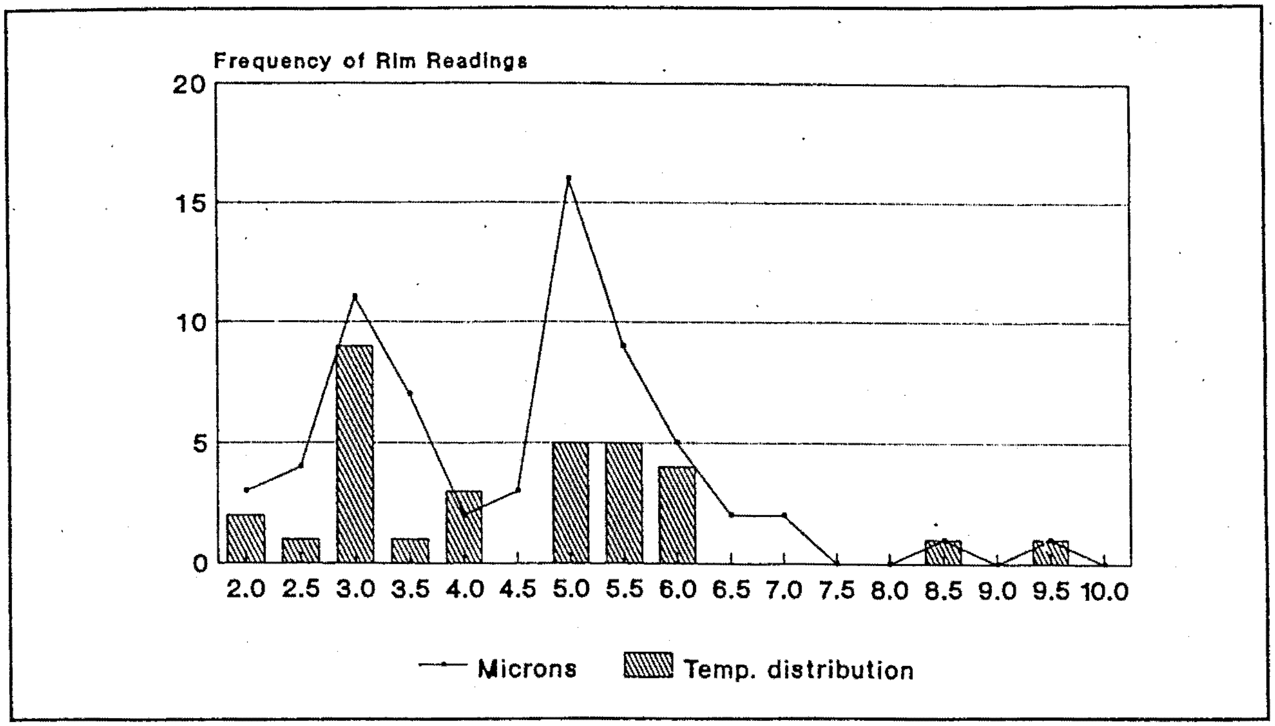


Figure 17: Obsidian Hydration Readings for Shasta Valley

Hydration rate studies of GF/LIW/RS geochemical source remain on-going. Realizing that a myriad of factors, not the least of which is temperature, can influence the rate of hydration, a determination of the chronological sequence of Shasta Valley's prehistoric occupation was attempted based on hydration rim readings. Utilizing the hydration rate formula for GF/LIW/RS obsidian developed by Nilsson, Hull and Bevill (1996) for the Shasta Valley region, it appears that the projectile point date ranges for the samples studied are generally consistent with temporal data presented by Basgall and Hildebrandt (Nilsson et al 1996:80). Table 12 provides the obsidian age estimates for the projectile points recovered from the Shasta Valley project based on the Nilsson-Hull-Bevill formula.

Table 7: Obsidian Age Estimates for Shasta Valley Points Based on Hull's Formula (in Nilsson et. al. 1996)

Point Type	Hydration (Microns)	Age Estimate (YRS B.P.)
McKee Uniface	3.6	1634
McKee Uniface	6.4	4102
McKee Uniface	6.5	4205
Clikapudi Side Notched	2.3	798
Clikapudi Side Notched	5.2	2943
Clikapudi Side Notched	5.4	3126
Siskiyou Side Notched	5.3	3034
Gunther Barbed	2.6	971
Gunther Barbed	3.1	1286
Gunther Barbed	3.8	1781
Desert Side Notched	3.1	1286
Lg. Corner Notched	5.5	3219
Mdm. Corner Notched	5.0	2764
Lg. Side Notched	6.0	3700
Mdm. Side Notched	6.8	4520
Mdm. Side Notched	5.1	2853
Reworked Side Notched	5.2	2943
Reworked Side Notched	7.4	5175

Historical Archaeological Remains

Of the fifteen sites in the study area with only historical remains, all but two can be directly related to early homesteading and/or livestock management activities (Table 7: Historical Site Characteristics). Three of these sites (CA-030-677, -689, -707), in addition to two of the sites also possessing prehistoric remains (CA-030-338 and -708), show some evidence of repeated historic era occupation in the form of foundations, possible privy pits, dams, and/or trash scatters associated with the consumption and processing of foodstuffs. Moreover, the lack of more substantial physical remains at CA-030-677 and CA-030-707 attest to the short term occupation or ephemeral nature which occurred at some of these early camps.

Glass, ceramic, and metal artifacts were all recorded in varying numbers. Animal remains were absent from all site assemblages and other more perishable historical items such as rubber and leather were observed at only one site (e.g., sun hardened rubber at CA-030-707). The majority of the recorded artifacts represent activities associated with stock management/ranching and/or domestic related activities (e.g. food preparation and consumption), such as dishes, glassware, and food containers. In all cases, the artifacts that were observed appeared to be associated with Euroamerican occupation. Based upon the types of artifacts noted it appears that these sites date from the mid-late 1870s to early 1900s.

The present integrity of these sites with short term residential remains is judged to be fair. All five sites have been disturbed to some degree. Historically, all of the sites once possessing structures were most likely subjected to eventual dismantling and scavenging of materials, resulting in the scant physical remains that are evident today. Moreover, recent activities associated with recreation vehicle use and modern-day cattle drives have further affected the integrity of this site type.

Of the nine historic sites which consist of rock features, seven are classified as rock wall/fences (CA-030-694, -670, -661, -704, -717, -716, -870) while two are classified as rock corrals (CA-030-701 and -869). The rock wall/fences extend anywhere from 200 yards to over two miles distance across the landscape and are generally poorly constructed of naturally occurring basalt and andesitic boulders and cobbles. The walls are sinuous in shape and follow the general topography of ridgetops or are situated on the inflection between a ridgetop's edge and its adjacent intermittent stream courses. The walls/fences average 2 feet to 4 feet in height and are about 2 feet wide and are non-mortared and non-dressed. In all instances the natural configuration of larger rock outcrops were utilized in the construction as natural wall segments to prevent access. The presence of split juniper poles and two-strand barbed wire incorporated in the wall/fence construction of several segments suggests that these features were used primarily for stock management.

Table 7: Historic Site Characteristics

BLM #	Site Type	Prim. Landform	Second. Landform	Elevation	Area	Depth	Vegetation	Hydro. Type	Hydro. Distance	Hydro. Period	Hearths	Foundations	Dumps	Trash	Water Convey.	Machinery	Walls	Fences	Trails	Roads	Other	Site Integrity	Era	Remarks
661	RW	3	1	1050	-	-	D	A	1	2	-	-	-	-	-	-	+	-	-	-	-	F	1870s-1880s	Stock management
670	RW	1	3	1000	-	-	D	A	2	2	-	-	-	-	-	-	+	-	-	-	-	G	-	
677	TS	4	20	823	3238	0	D	A	0	2	-	-	+	+	-	-	-	-	-	-	-	G	-	
689	HC	2	21	1180	5887	0	D	A	1	2	+	+	+	+	+	-	+	-	+	-	+	F	1870s-1900s	Late prehistoric evidence/stock management
694	RW	1	2	1050	-	-	D	A	1	2	-	-	-	-	-	-	+	-	-	-	-	P	-	
701	RW	1	3	1535	173	0	D	A	0	2	-	-	-	+	-	-	+	-	-	-	+	F	-	Circular rock alignment - stock management?
704	RW	1	3	1580	-	-	D	A	1	2	-	-	-	-	-	-	+	-	-	-	-	F	-	
707	HC	2	3	1180	15543	0	D	A	1	2	-	-	+	+	-	+	+	-	-	-	+	G	1908	Engraved rock - stock management
710	Trail	1	2	-	-	-	D	A	0	2	-	-	-	+	-	-	-	+	+	-	-	F	1860s +	Haught Brothers Cattle Trail/Road
716	RW	1	2	1188	-	-	D	A	3	2	-	-	-	-	-	-	+	-	-	-	-	G	-	
717	RW	2	15	1150	-	-	D	A	0	2	-	-	-	-	-	-	+	-	-	-	+	G	-	Corral type feature assoc. w/wall
869	RW	1	15	1402	-	-	D	A	0	2	-	-	-	-	-	-	+	-	-	-	-	G	-	
870	RW	1	3	1200	-	-	D	A	1	2	-	-	-	-	-	-	+	-	-	-	-	G	-	
873	Trail	1	2	-	-	-	D	A	-	2	-	-	-	+	-	-	+	+	+	+	-	G	1820s +/-	Yreka Trail/South Emigrant Trail
879	Trail	2	20	-	-	-	D	A	0	2	-	-	-	+	-	-	-	-	+	+	-	P	1850s +	Pitts River Road

Codes

Site Types

TS - Trash scatter
HC - Historic camp
RW - Rock wall

Primary Landform

1 - Mountain
2 - Foothill
4 - Valley

Secondary Landform

3 - Ridge top
4 - Ridge slope
6 - Hill top
7 - Hill slope
8 - Bench
9 - Saddle/pass
15- Drainage bottom
18- Other
20- Flat
21- Streamside bench/terrace

Depth

In centimeters

Vegetation

C - Oak Woodland
D - Juniper/Sage Woodland
E - Mixed Conifers

Hydro. Type

A - Stream
B - Spring

Hydro. Distance

0 - greater than 250 meters
1 - 0 - 50 meters
2 - 51 - 100 meters
3 - 101 - 250 meters

Hydro. Period

1 - Permanent
2 - Intermittent

Debitage Density

L - Low
M - Moderate
H - High

Site Integrity

F - Fair
G - Good
P - Poor

The remaining two historical sites possessing rock features also appear to be directly related to early stock management activities where they may have functioned as corrals. The presence of amethyst glass lamp chimney fragments near one of the features at CA-030-701 suggests a date of the late 1800s to early 1900s for its occupation/use. The present integrity of these nine stock-related sites ranges from fair to good.

Although there is no direct historical information regarding this site type, there are numerous accounts of stone fences being located in Shasta Valley and the surrounding regions (Van Camp 1984). It has been suggested that the stone fence or rock wall was the preferred fence type since "it was next to impossible to dig a posthole in the rocky soil" of the area (Van Camp 1984:111). Moreover, even if the wooden post was secured and the holes were dug, barbed wire was expensive and in short supply during this time period, and the first types tended to cut up livestock and still not control them (Van Camp 1984:111). Hence, it appears that ranchers turned to a readily available and cheap source of materials - the abundant natural volcanic rocks that occur throughout the region, especially within the hilly country.

As noted within the historic context section, there appears to have been several sources of cheap labor for the construction of fences. One of these sources appears to have been the less successful gold miners who were in the northern portions of the valley in great numbers during the late 1800's. Burton (cf. Van Camp 1984:111), suggests that rather than spend the harsh winter months in the mountains, these miners would come down to the valley, and in exchange for their labors would receive meals and a place to sleep from the local ranchers.

> Another source of labor, according to Norman Fiock of the Montague area, were the Portuguese sheepherders who built rock fences in the Sheep Rock area to pass the time while attending their flocks. While Dave Deter was establishing the present Davis Ranch around 1860, he used groups of ten or twelve Portuguese farmhands to build stone fences. Also during the same time, two other Portuguese, August Louie, and Joe Rose, are known to have been involved in fence building. "We worked at the Coonrod Ranch in 1860 or 1861 building many rock and rail fences. The going wage for building rock fences was 25 cents a rod; we build up to four rods a day." A rod is 16 1/2 feet. This works out to be 50 cents each for a day of hard fence building! (Van Camp 1984:111).

Based on extensive research and interviews conducted with local ranchers by Van Camp (1984), it appears that the rock walls/fences within the study area conform to his following hypotheses.

> 1. The rock fences were constructed by the original property settlers between 1855 and 1870 with most of the work being performed by Portuguese laborers.

2. The fences/walls were constructed out of necessity with the available supplies at hand - rock.

3. The fences/walls generally did not follow a straight course and were often not directly associated with property boundaries lines. Rather, they were sinuous in nature in order to incorporate natural rock features into their construction and to reduce the work load involved in carrying rocks to the fence site.

4. The design of the fences was not based on any particular cultural heritage.

5. The main purpose of the fences/walls was to clear the land in the valley bottom and to control the rancher's livestock on the range.

The remaining three historical sites consisted of portions of historical cattle (CA-030-710) and emigrant/freight trails (CA-030-878, -879). CA-030-710 is known locally as the Haight Brothers Road/Cattle Trail as well as Martin's Cattle Trail. This linear site consists of the remains of a well-used, impacted dirt trail containing little or no vegetation growth due to its continual use as a working cattle trail. The trail was originally developed by Charles Haight in the 1860s as a route to lead his cattle from Shasta Valley, where the cattle were wintered, to their summer range at Tennant, and later Grass Lake. The trail later became known as Martin's Trail when Brice Martin and his family began transporting cattle to these same summer grounds, a practice still on-going.

The trail bed throughout the BLM parcels averages 16 feet to 17 feet in width, is over three miles in length and possesses a 6 feet to 12 inch deep trough. Although there are varying accounts, it appears that the trail may have experienced some blading with a Fresno at some time in the historic past. Although the trail is fairly cleared of rocks, it is more primitive along its western portions. Portions of the central section of the trail (especially within Sections 1 and 6) are currently being used as an off-road recreation vehicle route. The integrity of this trail is considered to be poor to fair.

CA-030-879 contains the remains of an historic emigrant/freight road. This road, known as the Pitts River Road or Yreka-Fall City Road, served as a major transportation route for early settlers between the gold fields of Siskiyou County and the Pit River area in Shasta and Lassen counties. The width of the trail averages 11 feet and the roadbed within the Harry Cash Road BLM parcel is partially defined by small basalt boulders along either edge. A few isolated historical artifacts such as one wire nail and several ale bottle fragments were noted in direct association with the trail. The trail as known extends approximately 300 meters through one of the study area's parcels.

The trail route was only assessed in the one small BLM parcel. Within this parcel the trail itself for most of its length has been severely impacted as a result of past agricultural activities associated with land clearing. Thus, this portion is considered to no longer retain any significant physical and environmental integrity due to the impact of developments. Overall, its present integrity is judged to be very poor. It is considered to be a Class 4 - Impacted Original Trail based on criteria established by Oregon-California Trail Association (OCTA). However, one short segment of 300 feet appears relatively unaltered and is characterized by a roadbed lined on each side with cobbles. There are no signs of recent use. This short segment can be considered a Class I trail. This trail dates from the 1850s into the 1880s.

CA-030-878 represents that portion of the historical era Yreka Trail which extends through the study area. This trail was alternatively known as the Yreka Road, the Siskiyou Trail, the South Emigrant Trail, and portions of the [redacted] form the Lockhart Road and eastern branch of the Old California Trail. It served as a major transportation route for wagon trains heading for the gold fields of Siskiyou County during the 1850s to early 1860s. Those portions of the trail which pass through USFS lands have been recor[redacted] designation of FS 05-05-57-032. [redacted]

As noted by John Hitchcock on a Forest Service site record for a portion of this trail, the trail was likely originally created by Native American groups in the region. Its first documented historic use appears to have been in 1825 by trappers and traders associated with the Hudson Bay Company. The portion of the trail which passes near the southwest base of Sheep Rock near Barnum Springs is mentioned in the journal of John Work. Apparently Work passed along the trail in this area between September 7 and 8, 1833 (Maloney 1945).

Following the use of the trail by these early trappers and traders in the late summer of 1851, two Shasta Valley homesteaders utilized the trail's route when Samuel Smith and Ben Wright with their posse pursued a band of Modoc Indians from Shasta Valley to the Klamath Lakes area in an attempt to recover stolen livestock. Smith, Wright and company followed the trail's route from Shasta Valley east to the Lower Klamath Lake/Tule Lake area and then returned along the same route to re-enter Shasta Valley.

The first recorded use of the trail for emigrants was in August of 1852, when Sheriff McDermot escorted the Morrison Wagon Train from the Black Rock Desert in Nevada, along the Applegate Trail to the southeast edge of the Lower Klamath Lake. It was at this spot that the train then branched south to Yreka along the same route that Smith and Wright had used the summer before. For the next eight to ten years the trail was used by emigrants until the Nobles Trail was established. The Nobles Trail allowed settlers to avoid the frequent raids made on the trains by the Modoc Indians living around Tule Lake/Lower Klamath Lake. With the conclusion of the Modoc War, the Yreka Trail was once again utilized by freighters until 1904.

The entire length of the trail is 73 miles and it averages between 9 to 12 feet in width. For much of the trail's length, the old roadbed is evident, and in places, it is still used by off-road recreation vehicles and cattle drivers. In other places the trail appears basically undisturbed since its abandonment and is judged to be pristine. In these areas there is clear physical evidence of the original trail in the form of depressions, ruts, swales and/or tracks which often are eroded and/or visible only intermittently. The roadbed throughout portions of Sections 18 is often aligned by cobbles and boulders. There appears to be several parallel segments in a few places for short stretches in which it appears that the tracks are much wider than the width of a single wagon. It is hypothesized that this is a result of the emigrants moving their wagons over to a parallel track or by fanning out on the open sagebrush covered plains in order to avoid heavy dust and/or deep, loose sand.

Although portions of the trail through the study area may be classified as either Class 1, 2, 3 or 4, the majority is judged to be Class 2 - Used Original Trail (see Site Record Map in Hamusek et al. [1996] for class designations of various trail segments). While the original trail has been used by motor vehicles in many places, it still retains its original character and natural environment. It has not been bladed, graded or otherwise improved and typically remains as a two-track route traversing the original wagon trail. [redacted]

CHAPTER 7

INTERPRETATIONS OF INVENTORY RESULTS

The principal goals of the investigations were complementary, to (1) recover sufficient cultural resource inventory data on the potential land exchange parcels in order to fulfill the Bureau's legal requirements with respect to significant cultural resources; and (2) to assess the cultural and scientific research potential that the resources in question still possess which would provide data of significance to broaden the knowledge and understanding of the prehistoric and historical occupation and use of the area. This project was designed to comply with federal policy which requires that a cultural resource inventory be undertaken prior to any action which may potentially affect significant cultural properties, pursuant to Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 170), and procedures of the Advisory Council on Historic Preservation (36 CFR 800) as manifested through BLM's Programmatic Agreement with the Council and State Historic Preservation Officer.

In response to these goals, several research domains were developed in order to guide the investigations undertaken. In this chapter we will examine the extent to which these goals and questions were realized. However, before dealing with the archaeological value of the sites, it would be useful to address the question of their physical integrity in, albeit, a general manner.

Site Assessments

Site Integrity

The significance of any archaeological site rests upon its remnant integrity and its potential importance to contributing knowledge of the prehistory and history of California. Integrity refers to the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period. The National Register criteria specify that integrity is a quality which applies to historic and prehistoric resources in seven ways: location, design, setting, materials, workmanship, feeling, and association at the time of the investigation.

Of the fifty-one sites with prehistoric components recorded during the inventory, all but four are considered to possess a fair to good degree of integrity. Independent of natural processes that may disturb the deposits, each of the sites has been impacted to various degrees as a result of past agricultural activities, tree cutting, and cattle grazing. While most of the aboriginal sites in the study area appear stratigraphically or surficially intact, some sites appear more intact than others, suggesting greater significance. More specifically, the residential sites known as CA-030-668, CA-030-680 and CA-030-706 appear to possess a greater degree of integrity and complexity of content than the more ephemeral lithic scatters. Moreover, while all fifty-one sites appear to retain some degree of integrity in regards to location, setting, and feeling, due to post-depositional processes which have occurred at all of the sites, the spatial relationships between the original materials at least on and near the surface, appears to have been greatly altered.

None of the forty lithic scatter sites possess an intact and/or substantial subsurface deposit. The subsurface testing performed at these sites did not recover any macrofossil or faunal remains and cultural items were not recovered beyond the 10 cm level depth. A layer of bedrock and/or B horizon soil was found at the majority of the sites between the 10 to 20 cm level. The only exception to these results were those sites which appear to be associated with either long-term and/or short-term occupation. These include CA-SHA-266, CA-030-668, CA-030-680, CA-030-706, and CA-030-711 (see Chapter 8).

Prehistoric Research Objectives

In order to evaluate the significance of each site in relation to the criteria presented above, four research issues were generated to serve as the contextual framework from which site significance would be assessed. The potential of each site to provide information that would directly address these problems domains is assessed for each research issue.

Research Issue #1: Culture history/chronology - the identification of prehistoric cultural lifeways and resultant diachronic changes in these lifeways that may have occurred over time in Shasta Valley.

As noted by Thomas (1981), perhaps one of the most difficult tasks facing archaeologists today is attempting to link the archaeologically visible correlates with human behavior. It should be clear from details presented in the preceding sections that certain discrepancies exist over the delineation of ethnographic territorial boundaries, and it is possible that this portion of Shasta Valley functioned as a peripheral zone in which the exploitable resources were shared by both the Shasta as well as the Modoc during at least the later prehistoric periods. This hypothesis is, in part, supported by the general impression conveyed in past literature which states that both social and spatial boundaries among hunter-gatherers are extremely flexible with regard to membership and geographic extent (Lee and DeVore 1969:7).

Based on the data obtained as a result of these investigations, it appears that the remains and features from the Shasta Valley sites have limited potential to provide information which would directly address this problem domain. While it is true that the archaeological record does support existing ethnographic and historic records in regards to the use of the region by aboriginal peoples, at the present time none of the sites contains any evidence of changes in social organization or territorial patterns that may be attributable to the movement of different populations throughout the area. Moreover, the existing archaeological record does not contain sufficient data to address issues related to population replacement by differing groups. Items normally associated with trade, such as shell beads, were not found within any of the site assemblages. At the present time, the limited amount of material present appears to support a model of continuity rather than cultural displacement since the site deposits and artifact assemblages are similar in nature and context to each other as well as other nearby site assemblages. Such a conclusion is in accord with the premise that "Hokans" were in place for a long time in this area (see Whistler 1977).

Analysis of the projectile points recovered during the inventory coupled with obsidian hydration results suggest that at least this portion of Shasta Valley appears to have been utilized over a long temporal range. Aside from a questionable biface that remotely resembles a stemmed point, recovered projectile points include types that range from early Archaic times to contact. As shown in Figure 18, approximately eight percent (n=3) of the points recovered appear to date from 5000 B.C. to 1000 B.C. and may have been associated with the Early Archaic. The remainder, and bulk of the assemblage, contains specimens which fall between the range of 2000 B.C. to A.D. 500 (n=13; 59.3 percent), and from A.D. 500 to historic times (n=10; 32.7 percent) as based on hydration rims and cross-dating. Based on these data, it appears that the eastern portion of Shasta Valley and its adjacent mountains and foothills was occupied, or at least used most intensively during the Middle to Late Archaic, with occupation or at least use occurring, albeit at a lesser intensity, during the Early Archaic.

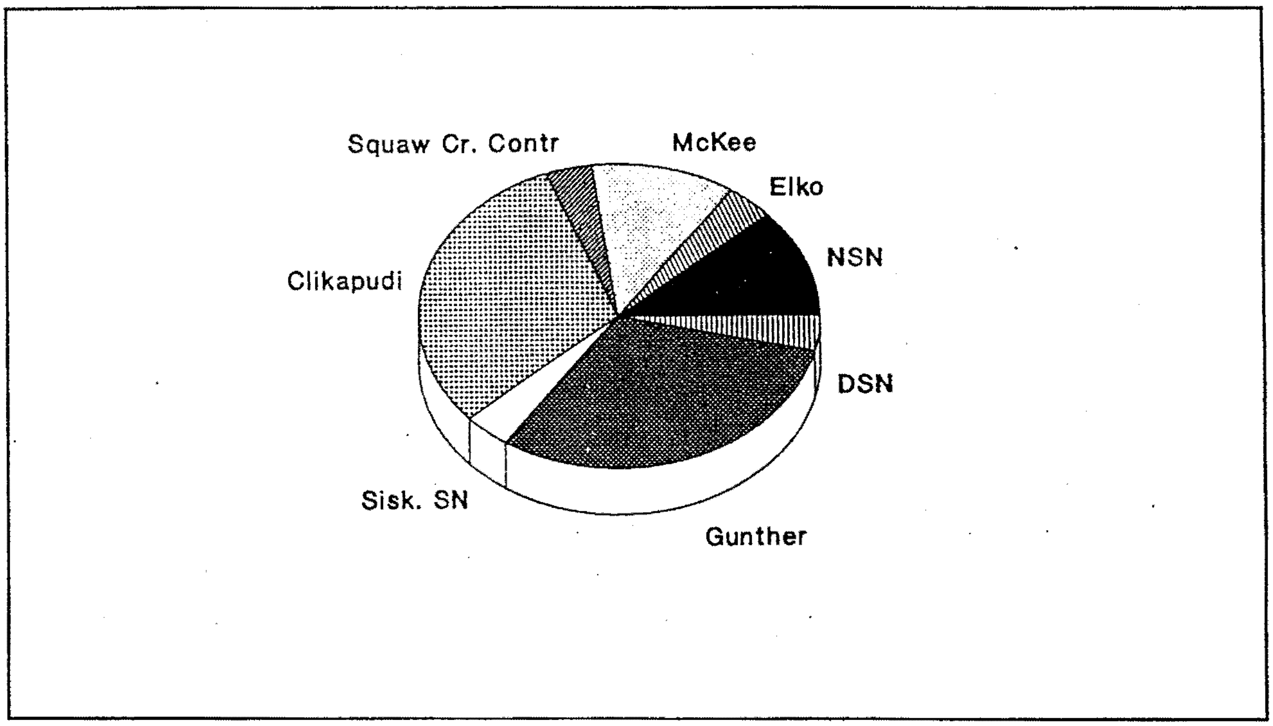


Figure 18: Frequency of Projectile Types from Shasta Valley

Obsidian hydration data also suggest that at least two periods of occupation/use or pulses of human activity were present in this portion of Shasta Valley. These pulses, we feel, are a crude measure of land-use intensity. As shown in Figure 19, the first, or earliest pulse starts at 6.5 microns where it reaches a peak of activity at 5.0 microns before declining. The second, or most recent pulse appears to have begun at 4.0 microns at which point there was a steady increase until a peak of activity was again reached at 3.0 microns. Moreover, this second, most recent peak appears to have been of lesser intensity than the earlier peak. Questions can be raised about sample representativeness, but we feel that the broad reach of our survey and collection strategy, approaching randomness, allows for an artifact collection and assessment that adequately, if only generally, reflects use history here.

These data correlate well with the chronology developed from the analysis of projectile points as well as with other regional cultural patterns. As shown in Figures 19 and 20, a regional comparison with hydration rim data on GF/LIW/RS obsidian obtained by Gilreath et al. (1995) indicates that, while there are some similarities with chronological sequences based on hydration rim readings discussed by other researchers, there are differences nonetheless. As shown in Figure 19, compared with sites in Butte Valley and Shasta Valley proper, our data correspond roughly with the hydration data from these areas. One major exception is the peak of activity occurring at the 6.5 micron level in Butte Valley. Another difference we see is that down on the Shasta Valley floor there appears to have been a greater intensity of land-use here starting around 2.5 microns which appears to correlate with Late Archaic times. We recognize that earlier occupation (5-6-7 microns) also occurred at the Louie Site along the Shasta River (Elena Nilsson, personal communication 1996). In comparison with hydration readings from sites in the Oregon southern Cascades and the Klamath Basin, there is also a pulse of activity occurring at 5.0 microns. However, the peak we see at 3.0 microns appears somewhat later in time (2.5) in the Klamath/Oregon regions (Figure 20), if we assume similar rates of hydration.

Perhaps the best fit of hydration data with temporal distribution occurs with information obtained by Hildebrandt and others for the PGT Pipeline Project in the Modoc Plateau region (Hildebrandt et al. 1995:3-19). Hildebrandt et al. (1995) plotted the mean age estimate of chronologically discrete analytical units on a graph in order to measure the level of land-use intensity over time. These values were then plotted on a 500 year interval graph in order to provide a rough measure of land-use intensity over time (Hildebrandt et al. 1995:3-19). As shown in Figure 17, our Shasta Valley hydration data fit in very well with that obtained for the Modoc Plateau if the two graphs were to be compared. The chronological distribution noted by Hildebrandt and his colleagues (1995) shows up in the Shasta Valley hydration data as a substantial increase when moving from early to mid-Holocene times, followed by two separate peak densities in the Middle Period between 4500 and 2000 B.P. Thereafter, we start to see a decline or less intensity of land-use of the upland region based on the hydration rim data.

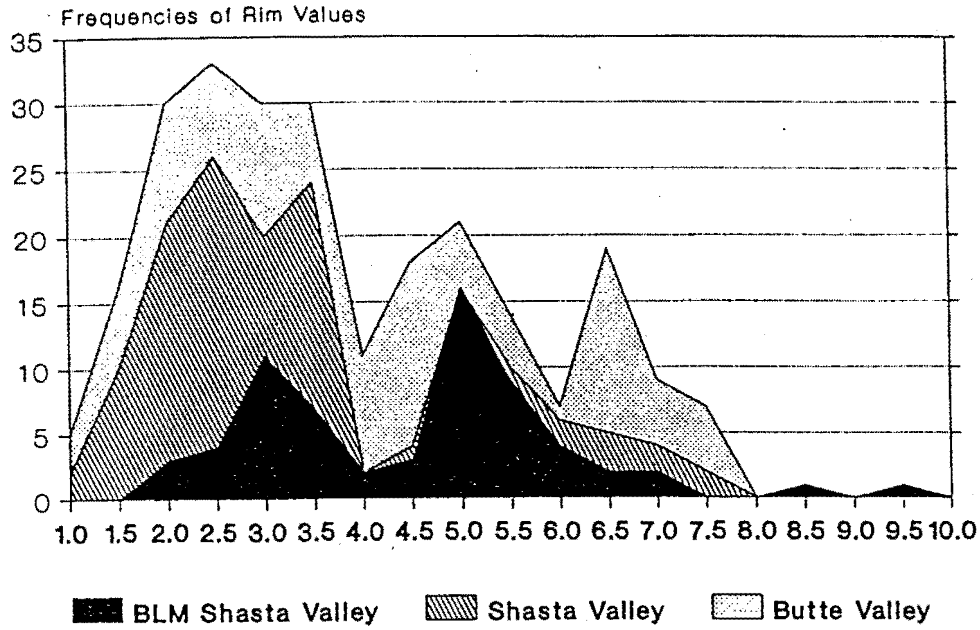


Figure 19: Obsidian Hydration Rim Values; Comparison with Gilreath et al. 1995.

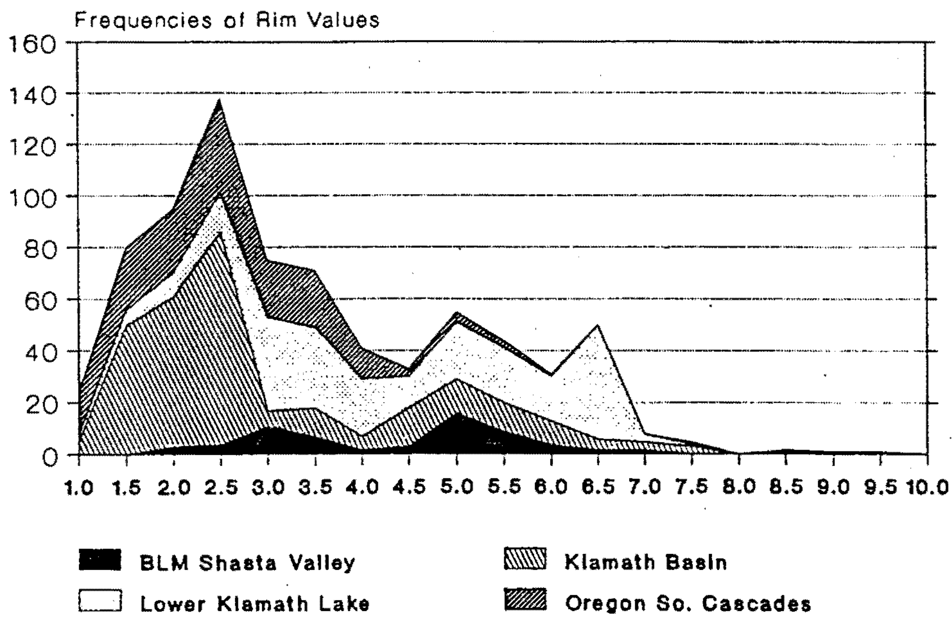


Figure 20: Obsidian Hydration Rim Values Comparison with Gilreath et. al. 1995.

These data suggest that the supposed lack of time depth in the Shasta Valley sequence noted by Nilsson (1991) may reflect a sampling bias. Based on data collected as a result of this study, the actual time depth of occupation for at least the eastern portion of Shasta Valley appears to extend back to the early periods of the Middle Archaic continuing up to the historic era. Evidence of Early Holocene use is sparse, primarily coming from large hydration bands on obsidian debitage attributed to hunting groups and their tool maintenance or production of projectile points.

Research Issue 2: Settlement pattern, population aggregations and subsistence strategies: The identification of various settlement/activity site types and the relationship between site type/isolate and resource procurement activities and demography.

The domain of settlement pattern analysis includes the spatial distribution of archaeological sites across regions and the spatial dimensions of inferred human activities (Rossignol and Wandsnider 1992:61). The relationship between settlement system and archaeological settlement pattern is problematic for several reasons. First, many archaeologists assume that the often complex components of archaeological sites can be interpreted by direct analogy with ethnographically derived, and idealized, settlement systems (Rossignol and Wandsnider 1992:62). Second, and perhaps most importantly, the relationship between the artifact diversity components and their inferred functional types, as well as the relationship between archaeological settlement size and inferred settlement type are, at the present time, poorly understood (Dewar and McBride 1992). Finally, the temporal complexity of sites is often lost in the attempt to associate sites with synchronic models of land use (Rossignol and Wandsnider 1992).

In terms of understanding the role in which the study area served in aboriginal ecosystems, the area may have been attractive to groups centered in such diverse settings as the central Cascades, Modoc Plateau, and Klamath Basin. Since subsistence strategies associated with each of these areas was likely to have been distinct, it is equally likely that the various groups that visited the region had functionally different reasons for exploiting the resources within the area. However, an alternative scenario is also possible in that the upland strategies may have been quite similar and the archaeological traces from different cultures (e.g., tool kits), may of necessity have been quite similar.

Since the study area encompasses a wide range of elevations, it was hypothesized that both midden/village sites and seasonal camps or task specific workstations were present in the study area, representing the entire yearly cycle of the Shasta and/or Modoc or earlier people's transhumance. This observation, for the most part, appears true. Although the archaeological sites that were located within the study area seem to represent a somewhat restricted range of past human activities, all of the site types encountered fall within the predicted range which was based on the available information. Thus, it appears that the information potential for the archaeological sites encountered as a result of this study may be judged high in regards to this problem domain.

As noted earlier, the most frequently occurring site type encountered within the study area was the lithic scatter. Of the fifty-one prehistoric sites recorded, thirty-nine, or 78 percent, consist of lithic scatters only. These sites occur in a variety of geomorphological contexts and were generally found without any other cultural materials in close association. They were characterized by as few as 20 flakes to as many as 1000 or more specimens, including projectile points, core tools, and bifaces. The density of debitage encountered at each of these sites was, in general, quite low. The majority of the lithic scatters encountered was classified as sparse, oftentimes highly dispersed and low-density surface scatters which extended across the landscape. None of the lithic scatter sites encountered revealed any indications of having a subsurface deposit.

In contrast to these task-specific type sites, there are the residential sites which appear to possess some indication of long term or repeated use of residential-oriented visits. Residential bases are situated at the valley-foothill interface, or further out into the valley at locations of permanent water for at least the last several thousand years. Moreover, milling of foods seems to have been confined to residential bases that also contained a full complement of other stone tool categories. We do, however, acknowledge the fact that some lithic scatters may have served as residential sites and conversely some occupation sites may have served in part as tool making locales. We also acknowledge that a few milling tools were found in a foothill setting at what are basically lithic scatter-like sites on the western side of Sheep Rock. Less than 15 milling tools were found altogether in the study area.

With vegetation zones being relatively uniform over the study area, hydrology, slope and topography appear to have entered into the selection of settlement localities more strongly. Since settlement decisions are subject to a variety of constraints, the actual location of a particular site will reflect these constraints as well as the strategic goal of minimizing distance to resources (Dreyer 1984:70). One of the abiotic constraints relevant to the study area was probably water. Given the long, dry summers that characterize the climate of this area, the availability of water would most likely have constrained settlement decisions. It was not surprising, therefore, that there was a correlation between the type of site and its proximity to water. When the residential sites are factored separately from the lithic scatters and presumed hunting blinds, the data reveal that 80 percent of the residential sites encountered during this inventory are located within 50 meters of a permanent water source. This is in contrast to lithic scatter sites where less than half (42.5 percent) are located within 50 meters of any type of water source. Of the forty lithic scatter sites recorded, 100 percent were associated with seasonal or ephemeral water sources which suggests that these sites were most likely utilized on a very temporary basis. These data reflect the fact that cultural selectivity and patterning were taking place during aboriginal times, influenced in large part by environmental factors.

Based on data gathered as a result of this investigation it appears that logistically-oriented forays were taking place from base camps into the surrounding hills. We can only assume that these groups were focused on the exploitation of large game animals such as elk, deer, bear, and mountain sheep during the fall and winter months. We also surmise, but have no substantial archaeological evidence other than site proximity, that shallow lithosol exposures with an abundance of geophytes (tubers and bulbs) were also exploited, most likely by women. Unlike the large game, however, these resources would most likely have been gathered during the late spring and early summer months. It is likely that irrespective of hunting or foraging orientation, both of these task-oriented groups may have had very temporary camps evidenced only by flaked stone remains.

The variety of lithic scatters and their composition may be a reflection of family groups in some cases, or male-dominated work sites. Other lithic scatters clearly are the byproduct of prospecting and reducing chalcedony and cryptocrystalline silicate materials exposed in the rocky volcanic hillside in small boulder and cobble forms. While many lithic scatters and isolates were located, these sites generally did not contain dense, broad exposures of flaked stone. Subsurface testing and geomorphology clearly show these to be surface manifestations. Considering the long period of foothill use and site losses due to erosional-depositional processes, we are of the opinion that large populations were not using these foothills, but that they were limited to parties each year with broad-ranging hunting and foraging practices.

Research Issue #3: Lithic technology patterns - the identification of technological aspects and topological considerations associated with flaked stone tool manufacture at each site, and the comparison between observed patterns at these sites individually and by group with those of surrounding sites in the region.

The identification of technological and typological processes associated with flaked stone tool manufacture and the comparison with observed patterns at sites on a regional level is viewed as a major research domain for most prehistoric studies undertaken today. Following the introduction of Binford's (1980) concepts regarding residential and logistical mobility strategies, a number of investigators (Bamforth 1986, 1991; Basgall 1989; Goodyear 1979; Gould and Saggers 1985; Kelly 1983, 1985, 1988; Shackley 1986, 1987, Shott 1986; Torrence 1983, 1989) have attempted to demonstrate that lithic technology and procurement in hunter-gatherer contexts can be viewed as a reflection of mobility and settlement choices made by prehistoric peoples.

Mobility strategies may be defined as the annual pattern of movement over the landscape pursued by hunter-gatherers, while "seasonal rounds" refers to the particular resources and locations exploited by a group of hunter-gatherers (Kelly 1983, 1985). Mobility strategies are important therefore in understanding how resources are procured (Shackley 1990:19). Mobility strategy studies may be viewed as just one facet of a growing body of middle-range theory that deals specifically with forager subsistence economics (Shackley 1985:2). The value of hunter-gatherer mobility strategy theory is that is seeks to explain the variability within the archaeological record rather than simply creating another set of generalizations about hunter-gatherer behavior (Thomas 1983:11).

To briefly summarize Binford's (1980) model, logistical mobility refers to the movement of organized task groups from a residential location to procure and/or process a variety of specific resources. A logistical strategy implies storage of processed resources and generally increased time spent at a particular residential base. The groups that practice this form of mobility are often referred to as "collectors."

In contrast, "foragers" are highly mobile groups who make relatively frequent residential moves in order to "map onto" a region's resource locations and relocate the group closer to the desired item. Because of the frequent residential moves associated with this type of strategy, foragers do not generally store foods. Instead, they procure and process the resource for immediate or nearly immediate consumption (Kelly 1985).

Through an assessment of patterning in debitage, activities related to site function and logistic use may be revealed that are not apparent through observation of formal tool types (Basgall 1989; Goodyear 1979; Kelly 1985; Kelly et al. 1987; Shackley 1986, 1987; Shott 1986). Taken a step further, this view would hold that changes in settlement patterns, whatever the cause, will likely be accompanied by predictable shifts in the kinds and proportions of various debitage morphological types that comprise these assemblages. In other words, adjustments in regional tool kits may be used to evaluate broader changes in land use.

As noted by various researchers (Bamforth 1986, 1991; Basgall 1993; Delacorte and McGuire 1993; Elston 1982, 1986; Gilreath and Hildebrandt 1993; Kelly 1985a; Shott 1986), a specific group of tools and their associated technological organization appears to characterize more regularized, logistically well-organized settlement systems. Delacorte et al. (1994) suggest that flaked stone technologies, in these cases exhibit a profound shift toward the use of large, often standardized bifaces. While flake tools, cores and other implements encountered in non-intensive type systems persist, they represent a less important element in most collections. These changes suggest that bifaces formed the nucleus of most logistically organized tool kits, where they would provide both the versatility and durability that would be needed during their logistical forays (Basgall 1989; Delacorte and McGuire 1993; Delacorte et al. 1994; Gilreath and Hildebrandt 1993).

The logistical tool kit described above is contrasted by that noted for residentially oriented groups. Throughout the Desert West, the early to middle Holocene period tool kits are distinguished by an assortment of well-made domed or conical scrapers/planes that essentially disappear in later times (Delacorte and Hildebrandt 1994:47). There is also evidence for curation of most artifacts, especially those made of high-quality toolstone materials such as obsidian. Thus, it appears that the flaked stone tool tradition of highly mobile groups would revolve around a generalized-use percussion flake tool/core technology that could be fashioned from readily available materials. This pattern is mirrored with the ground stone milling equipment in these assemblages, since little benefit would be gained by manufacturing more formal tools that were left at sites that might rarely be revisited (Delacorte and Hildebrandt 1994:47).

The artifact assemblage at all fifty-one prehistoric sites is nearly identical, consisting predominantly of flaked stone tool by-products in the form of obsidian debitage. Local stone was employed principally for initial and/or primary core reduction and early stage biface thinning and with less frequent evidence of late stage biface thinning or pressure flaking. In contrast, obsidian debitage occurs as biface thinning flakes, whether it be early, middle or late stage types. Within both residential as well as lithic scatter sites there was a greater emphasis on mid- to late-stage biface manufacture and/or reduction with obsidian materials than with locally occurring chalcedony and cryptocrystalline silicates. Moreover, the predominance of obsidian pressure and notching flakes provides further evidence that the final stages of projectile point manufacturing or, perhaps retooling, was undertaken at a majority of the sites examined. These data suggest that thinning, resharpening and/or reshaping of bifaces were important activities at nearly all of the sites.

Late stage core reduction activities are only minimally represented at several of the sites examined where they are found to occur on all material types. The absence of bipolar elements from all raw material types in the Shasta Valley collection is notable because of their presence in site assemblages from the surrounding region (Nilsson 1985a:195). Since bipolar technology is generally regarded as an indicator that the raw material was being utilized intensively, the absence of this technology from the eastern Shasta Valley collection suggests that there was no need to maximize tool stone.

These patterns of lithic reduction sequences are substantiated among the flaked stone tools. Local materials are found primarily among cores and Stage 1-2 bifaces, while obsidian tools consist overwhelmingly of Stage 3-5 bifaces, edge-modified pieces, and projectile points. The presence of early stages of lithic reduction or flaked stone tool manufacture from obsidian materials are only represented in limited amounts.

These data indicate that local toolstone materials were being reduced from previously unaltered pieces of parent material such as botryoidal chalcedony crust and cryptocrystalline silicate nodules and perhaps basalt cobbles. Obsidian was arriving in the study area in a preformed state as bifacial blanks or large flakes which required only the removal of percussion thinning or pressure flakes for modification. In addition to the reduction of preformed pieces, there is some limited evidence for the reuse or reworking of older obsidian artifacts in the lithic collection which suggests that scavenging of toolstone from other sites may have served a role in the lithic reduction technological sequence.

Based on the flaked stone tool analysis, it appears that the data presented here would support a logistical rather than residentially-organized settlement system. We do, however, acknowledge that Binford's original model would rarely present itself in the archaeological record as an "all or nothing" scenario. Rather, we envision a continuum in which the various residential patterns and resultant archaeological assemblages may be blurred around the edges making it difficult to determine on this broad of a scale.

Research Issue #4: Lithic procurement ranges and exchange networks - the identification of prehistoric obsidian procurement ranges and lithic procurement strategies of the aboriginal inhabitants of Shasta Valley.

Although patterns of obsidian dispersion can be partially accounted for by prehistoric exchange systems operating within a fairly elaborate socio-ceremonial system, ethnographic data and archaeological work conducted by Binford (1979), Shackley (1985, 1986, 1990) and others (Kelly 1983, 1985b; Meltzer 1984) suggest that among many hunter-gatherer populations the majority of the lithic raw materials enters into the system embedded within the subsistence procurement schedule. Thus, characterizing the lithic raw materials within an archaeological assemblage and determining their source may be a potential indicator of at least a portion of the territory exploited through the annual cycle or seasonal rounds (Shackley 1985).

Viewed in this manner, obsidian source profiles often relate more directly to aspects of residential mobility and group provisioning strategies than to specialized collection forays or formalized socio-ceremonial exchange relationships (Basgall 1989). It is perhaps in this domain that the eastern Shasta Valley sites have the greatest potential to provide information which would significantly add to the regional data base. The dominant lithic material noted at nearly all the sites for flaked stone tools, as well as debitage, was obsidian. It is possible that a range of obsidian from different geochemical source groups would be indicative of the use of the eastern Shasta Valley area by different aboriginal populations. Thus, the information potential is judged to be high for each site with regards to this problem domain.

Our results indicated that the obsidian from eastern Shasta Valley is overwhelmingly dominated by glass which derives from geochemical sources within the Medicine Lake Highlands. Of the 30 specimens subjected to XRF analysis, the data indicate that approximately 97 percent, or all but one, have spectral signatures consistent with those assigned to the GF/LIW/RS geochemical source group, or the composite group designated as the Grasshopper Group. The remaining specimen derives from the Railroad Grade geochemical source which is also located within the Medicine Lake Highlands.

In regards to obsidian procurement patterns, these data indicate that there was a reliance on obsidian from the nearest source. The Medicine Lake Highlands is located approximately 35 airmiles to the east of the study area. Based upon work conducted by others within the Klamath River Basin and northern Shasta Valley, this reliance on obsidian from the nearest source is not unexpected and is not inconsistent with the distance-decay model developed by Renfrew (1977).

However, what was somewhat unexpected was the fact that obsidian from the Medicine Lake Highlands was the preferred glass for all artifact classes regardless of the time period involved. In other words, the data we recovered failed to reveal any preferential differences over time, or among utilitarian versus possible socio-ceremonial items (e.g., finely made bifaces) in regards to obsidian sources. To the contrary, within the Klamath River Canyon just to the north, a probable corridor of travel, greater source variation is apparent, varying also with time (Joanne Mack, personal communication 1996).

Unfortunately, the data we recovered failed to reveal any significant differences in the frequencies of tool stone types in relation to obsidian usage except in a very general manner. While it is true that the majority of projectile points and late stage bifaces recovered during the inventory were fashioned from obsidian, the results are not fine-grained enough to discuss issues related to tool stone preference. However, the results do indicate that the use of obsidian for flaked stone tools has a long history within this portion of the valley. Obsidian hydration rim readings, although few in number, suggest that obsidian arrived into the eastern valley sometime during the Early Archaic and its presence as a dominant toolstone source continued up to the historic era.

Historical Research Objectives

For the historic segment of this project, our research was directed toward an understanding of the manner in which historical sites and features integrated with, and were representative of, the historic cultural context as presented earlier. Thus, the purpose of this inquiry was to focus on three main areas of historical land use patterns as identified during archival research: exploration and transportation systems, settlement/homesteading, and livestock management.

From the standpoint of observable archaeological remains, the post-contact history in the study area mainly involves the remnants of California farming/ranching activity. Of the fifteen sites encountered within the study area, all but two are clearly related to early homesteading and/or livestock management activities.

Despite the well-documented use of this area during the historic era, surface artifacts associated with the historic period were few in number, and when observed, often fragmentary. Glass, ceramic, and metal artifacts were recorded in varying numbers. Animal remains were absent from all site assemblages and other more perishable items such as rubber and leather were observed at only one site. The majority of the recorded artifacts represent activities associated with stock management/ranching and or domestic life and appear to be associated with Euroamerican occupation. Based on the type of artifacts observed, it is quite likely that artifacts recovered from these sites would yield minimal additional information about the social and ethnic make-up of the settlers/workers who occupied the study area.

Approximately 20 percent of the historical sites within the study area yielded evidence of long-term and/or repeated historic occupation in the form of foundations, possible privy pits, dams, and/or trash scatters associated with the consumption and processing of foodstuffs. The lack of more substantial physical remains or well-developed dumps attest to the short term or ephemeral nature of these sites. However, it should be noted that modern, as well as historic land-use has modified the landscape resulting in damage to many of the historical resources. Recent activities associated with recreational vehicles, ranching, and logging have resulted in negative impacts to the sites as well. It is equally likely that the historical sites which possessed evidence of more substantial remains (e.g., foundations at CA-030-689) were most likely subjected to dismantling and scavenging of materials, resulting in the scant physical remains that are evidenced today. Moreover, evidence of livestock use is commonly seen throughout the study area. Undoubtedly, all of these activities have caused considerable damage to cultural resources. However, the role played by earlier residents in the re-use and salvage of older materials should not be summarily dismissed.

Although the majority of the land situated on the valley floor was used for agricultural and/or ranching purposes, the lands along the foothills and crossing over the mountains to the east included several historic period trails which were used to lead cattle and sheep to their summer range. One of these trails, the Haight Brothers Cattle Trail/Road, passes directly through the study area. This trail led herds over the north side of Sheep Rock to the summer range at Tennant and Grass Lake. Although this trail may have had some improvements done to it with a Fresno by Charles Haight in the mid- to late-1800s, it has apparently always functioned as a cattle trail.

In addition to cattle, sheep raising was a major activity in the valley during the late 1800s and early 1900s. The summer range of these bands was the summit of the Cascade Mountains from Mt. Shasta to the Klamath River in the vicinity of Klamath Hot Springs while the winter range was in Shasta Valley. It was at the base of Sheep Rock, near O'Neil Flat on private land that Bob Martin in the 1920s had a sheep camp there known as "Rat Camp."

Based on extensive interviews conducted with area ranchers by Van Camp (1984), as well as archival research undertaken for this study, it appears that the rock walls/fences within the study area were constructed by the original Euroamerican settlers between 1855 and 1870. The fences/walls were constructed out of necessity with the available supplies at hand - rock - with most of the work being performed by out of work miners or Portuguese laborers. The design of the fences were not based on any particular cultural heritage and their main purpose was to clear the land in the valley bottom for agricultural purposes and to control the rancher's livestock on the range. Moreover, it appears that the walls/fences were constructed in a sinuous manner in order to reduce the work load involved in carrying rocks to the fence site.

Clearly, the most significant historic sites in the region are the Yreka Trail and, perhaps, the Pitts River Road. These trails and associated personages which developed and utilized them, constitute an integral part of the development of Shasta Valley and areas beyond. Unfortunately, the majority of the Pitts River Road which is present within the study area no longer retains any significant portion of its physical and environmental integrity due to the impact of past developments.

Although portions of the Yreka Trail through the study area may be classified as either Class 1, 2, 3 or 4, the majority is judged to be Class 2 - Used Original Trail. While the original trail has been used by motor vehicles in many places, it still retains its original character and natural environment. It has not been bladed, graded or otherwise improved and typically remains as a two-track route traversing the original wagon trail. In Section 2 there is an especially pristine segment of this trail and it crosses one of the study area's stone walls.

Moreover, the trail is well remembered by former and current residents of the area. Thus, in addition to yielding physical remains, the Yreka Trail serves as a mnemonic for oral history data gathering. For these reasons, the Yreka Trail route stands first among the historic sites that have the potential to yield information on many of the historic research domains relevant to this area, and has a powerful association with both famous historic travellers as well as development of Shasta Valley and beyond.

CHAPTER 8

CONCLUSIONS, EVALUATION OF SITE SIGNIFICANCE, AND RECOMMENDATIONS

Conclusions

Since the beginnings of human history, societies with economies based on hunting and gathering have been in existence. Effectively beginning in the 1960's research on hunters and gatherers (or foragers) has focused on the complexity of these groups. People who were originally classified in the 1960s or before as being "solitary, poor, short, nasty, brutish," and who were living constantly on the edge of starvation, became known by the 1980's as the only truly affluent culture. Over the last 10 years, however, this view is once again being challenged. For instance, Yesner notes (1994:151),

> evidence for episodic seasonal population stress is widespread among hunter-gatherers in arctic, temperate, and arid regions where resource seasonality existed. These effects were not simply limited to "simple" hunter-gatherers with low population densities in resource-poor environments; they were also found among "complex" or "affluent" hunter-gatherers, in coastal regions. Greater sedentism, larger populations, and the resulting greater intensification of local resource exploitation among such societies elevated seasonal resource imbalances to a different level; technological and settlement pattern solutions were sought, but their effect was limited.

The fact that the aboriginal groups which populated the study area did not develop agriculture indicates that these peoples continued to be affected by seasonal natural resource stress which was likely episodic in nature. Archaeological signatures of such intermediate-level stress episodes will depend on whether the response was biological or cultural in nature (Yesner 1994:154). While it is not possible to determine evidence of biological stress based on the data in hand, it may be possible to determine the amount of cultural response to episodic periods of stress. It is expected that cultural responses to episodic stress would include changes in subsistence, intensified use of marginal resources, and/or shifts in settlement patterns to include marginal resource areas. We might also expect resource-related ritual and inter and intra-group interaction (Bernbeck 1991:138).

In the analysis of sites and isolates - patterns of remnant uses across the landscape - we must remember that we are only dealing with partial, dynamic systems, a series of slices of lifeways and social relationships. Still, by looking at these various cultural remnants with an eye toward their significance from a research point of view as mandated by law and contemporary management direction, there is considerable room for interpretation and explanation, despite inherent sampling biases.

What seems most obvious is a relative conservatism of prehistoric land use, but uses over the landscape that pulsated from mid-Holocene to later times, possibly because of resource stress caused by human agents and/or climatic changes. Evidence of Early Holocene use is sparse, primarily coming from large hydration bands on obsidian debitage attributed to hunting groups and their tool maintenance or production of projectile points. Residential bases from possibly Middle Archaic and certainly Late Archaic times were situated at the valley-foothill interface, or further out into the valley at locations of permanent water. For this study locality, we have fairly good evidence that these bases were present for the last two to three thousand years at least. Native American Indian family groups were apparently taking advantage of the ecotonal aspects of eastern Shasta Valley. Of probable importance was the transitional area between valley grasslands and a varying foothill mosaic of juniper woodland, oak woodland, grasslands, sagebrush/rabbitbrush, lithosol meadows or glades, and chaparral. Possibly of less importance was the higher ecotone between this varying mosaic of vegetation and mountain mahogany/chaparral/conifers. However, the diverse effects of these vegetation patches and their variation over time and space on aboriginal land uses is uncertain.

Milling of foods seems to have been confined primarily to residential bases, including several sites that suggest seasonal and/or ephemeral use. Milling tools were not found at upper foothill or mountain sites, although we expect they occur here in some locations not surveyed. Larger residential bases were not found in surveyed foothill parcels except, perhaps, at the base of Sheep Rock, but they are known from adjoining valley or valley edge lands at SIS-267, SIS-13, and other sites reported by local ranchers, including Pluto Cave.

What is most apparent in the archaeological record is that there were apparently logistically-oriented forays from valley-edge base camps into the surrounding hills. Gambel (1991:5) has noted "high residential mobility by a core group rather that individuals working away from a base, can be predicted from general ecology and results in a regional signature of comparatively high resolution which forms a continuous scatter, albeit variable in terms of density, across the landscape." While is was probably not a black and white pattern, individual and small task groups foraged in the hills, we expect, over time. We can only assume that these forays by various work groups and individuals were focused on the local elk, deer and sheep herds that populated the region, especially during fall and winter months. Other game must certainly have been available, including rabbits and quail. We also surmise, but have no substantial archaeological evidence other than site proximity, that shallow lithosol exposures with an abundance of geophytes (tubers and bulbs) were also exploited, probably by women. Chalcedony, chert and basalt materials were found, prospected and worked by men and women. These task-oriented groups may have had very temporary camps evidenced only by flaked stone remains - irrespective of hunting or foraging orientation. Milling tools would not have been a necessity in terms of geophyte gathering and processing.

Demographically, the size and complexity of sites observed (assuming there is a sample here that approaches representativeness, as we believe) suggests relatively low population levels utilizing a broad spectrum of resources. Interestingly, two of the dietary mainstays of the Shasta, salmon and acorns, were apparently not direct factors in the use of the study area. In fact, increasing use of these food resources may have occurred elsewhere in the Shasta Valley leaving different signatures outside the study locality, such as in the milling tool kits. Such changes may be reflected in the decline in the number of recent obsidian hydration readings, sampling problems aside (e.g., if we had cut more Gunther Barbed points for hydration analyses, we suspect that more low readings would have been obtained). We also see a main pulse of use based on obsidian hydration, just following the mid-Holocene warm/dry interval, although it is not apparent what effect this interval would have had on local resources. The influence of climatic variation on plant and animal populations and resulting influences on various Native American Indian peoples near and far is generally beyond the scope of this presentation, but no doubt there were some effects. Nilsson (1988:223), for instance, has related a possible change in subsistence practices in the late prehistoric period in Shasta Valley from earlier times.

We can go so far as to hypothesize that population increases and resource intensification in other valley zones allowed more seasonal use of the Shasta/Modoc interface area by Modoc peoples. However, our data do not show this. Ethnographic evidence that indicates Sheep Rock only served as a Shasta seasonal use area also is suggestive that more intense late (and maybe earlier) prehistoric settlement and use was out in the lower valley zones, and that our sample area is a strictly seasonal exploitation zone from at least Middle Archaic times until near contact.

The issue of increased social complexity as related to resource abundance is generally beyond the reach of this study. The survey zone was probably marginal to reliable, favored, high-yield resources in terms of spatial extent, and we certainly have no evidence of complex social structures. We would look to large valley middens for such evidence. For instance, a late prehistoric infant burial from CA-SIS-332 was exposed by Nilsson (1988) that contained a diverse, elaborate artifact assemblage. These accompaniments suggest social stratification may have been occurring by this time. Certainly, the number of wealth items for an infant suggests an ascribed status among this group or sub-group.

It is evident that the apparent marginality and conservatism expressed in the prehistoric remains in this study locality is equally reflected in the historic remains. The fact that the majority of these BLM lands were never homesteaded speaks for itself. These lands were relegated to a support role for livestock raising, involving both sheep and cattle. Much of the historical record relates to this industry. We also have present early exploration and travel corridors of some importance to the economic developments within Shasta Valley.

Overall, through this management-driven study we have gained valuable insights to prehistoric and historical land uses in Shasta Valley. These insights should serve for judicious land management decisions as well as provide building blocks of knowledge regarding the regional prehistoric and history.

Significance Evaluation

This report has been directed at determining the location of potential National Register of Historic Places properties on the scattered parcels evaluated. The above discussion relates to this process. No properties were previously listed but little of the area had been inventoried. This evaluation was directed at an examination of singular sites and the possibility of larger suites of sites that might form a district. We also were concerned with landscapes that might have historic or traditional use value in light of National Register of Historic Places criteria.

Because of the above concerns, we directed an inventory scheme that would insure that all potential properties would be located. This inventory was supplemented by archival research and communication with local and old timers and Native American groups. We also developed a series of research issues for the prehistoric and historical sites, issues that help set the historic and prehistoric context of the various sites. These issues and their relationships to the sites and isolates have been previously discussed. We have also addressed the environmental setting of these sites and the relative integrity issues. It is our contention that all potential National Register of Historic Places have been located on the parcels, with the exception of an incomplete survey of the Sheep Rock parcels discussed below. This has been an inventory that is more than reasonable in terms of discovery balanced with labor and costs. Certainly not all isolates were discovered and we suspect that a few minor lithic scatters of little significance could have been missed due to spacing, terrain and vegetation constraints. Any buried or concealed sites would not have been found unless erosion had exposed a profile or we were able to see clues within small shelters and taluses. No such evidence was forthcoming during the inventory despite often intense looking.

The 150 isolates by definition are not considered eligible for the National Register of Historic Places. Even the extremely low density lithic scatters that we have classified as isolates lack any substantive scientific value due to their surficial nature and low artifact count. The remaining sites discovered during this project include 39 lithic scatters, a lithic scatter with historical camp debris, six prehistoric residential-type sites, two aboriginally-used rockshelters (both badly looted), nine rock walls, one rock wall with a rock enclosure, three historical period trails, two rock enclosure sites, two historical camps, and one historical trash scatter for a total of 66 sites.

It was clear from this inventory and site types discovered that there was the potentiality for a number of National Register sites and even a possible National Register district around Sheep Rock. Furthermore, it was determined that the historic Yreka Trail crossed a number of BLM parcels at the southern end of the project area, including the base of Sheep Rock. This trail is part of the California Trail, a trail that has been determined to be a portion of the National Historic Trails System. Since this Sheep Rock vicinity held known and potentially significant cultural resources, prior to completion of the inventory it was decided by BLM management to eliminate the three Sheep Rock parcels in Township 43N, Range 3W, all or portions of Sections 6, 8 and 18. In doing so we have eliminated the necessity in terms of this action of evaluating 11 lithic scatters, four residential sites, two occupation rockshelters, one lithic scatter/historical camp, three rock walls, portions of two historic trails, and one rock wall/rock enclosure. The remaining sites discussed below should, at least in part, be viewed in terms of their significance or lack of significance with respect to this cluster of important-appearing archaeological remains found within a relatively similar environmental setting not too distant (Figure 21).

The Area of Potential Effect (APE) for the remaining parcels includes 28 lithic scatters, six rock walls, two prehistoric occupation sites, two rock enclosure sites, one historic camp, one refuse deposit, and three historic period road segments. Each site category will be discussed accordingly below bearing in mind the previous documentation and discussion.

All of the lithic scatter sites were considered in light of the California State Office of Historic Preservation's Programmatic Approach to Sparse Lithic Scatters, officially the California Archaeological Resource Identification and Data Acquisition Program: Sparse Lithic Scatters (CARIDAP). Field judgements were made considering the CARIDAP criteria and our own regional experience and expectations based on the local geomorphological situation. Test units were placed at many of the sites except where bedrock outcropping, steep slope, pedology (lithosols), erosional profiles, evidence of colluviation, and type of flaked stone material and its placement on the site dictated otherwise. At sites not tested, these above factors strongly suggested that no subsurface remains would be found. In those sites of such a character that were tested this proved to be the case. We took a somewhat liberal approach to the definition of a sparse lithic scatter in a few cases. If a projectile point or two was present, or a presumed flaked stone tool, it was still considered a sparse lithic scatter nonetheless. The areal extent of a number of these sites also exceeds the baseline for consideration. However, in such cases the flakes were often extremely sparse and there were many areas lacking flakes within the site so actual overall size is misleading. Furthermore, slopewash, cow trampling, and colluviation in the obvious spread of flakes was also considered. In three cases a single milling tool was found near the site periphery, on the surface of what, for all intents and purposes, was a lithic scatter. These sites were also tested and, in one case, a subsurface deposit was found.

We feel that we have garnered sufficient information from our examinations of the lithic scatters of all sizes and configurations to pass judgement on their subsurface character and scientific complexity. Analyses of flake stone debris from units and surface collections were made and samples of obsidian and other flaked stone from most of the sites was secured. Obsidian studies were also conducted. Our analyses herein have garnered much scientific data from these sites. Aside from the site that revealed a subsurface deposit mentioned above (and considered a residential site in this analysis), one other site that appeared to be a sparse lithic scatter was determined to have a subsurface component and was thereafter considered a residential site as discussed below.

Based on our examination of the various lithic scatters, all without subsurface components are considered to be ineligible for inclusion in the National Register of Historic Places due to an absence of scientific complexity. Our investigations of these sites in the field, through

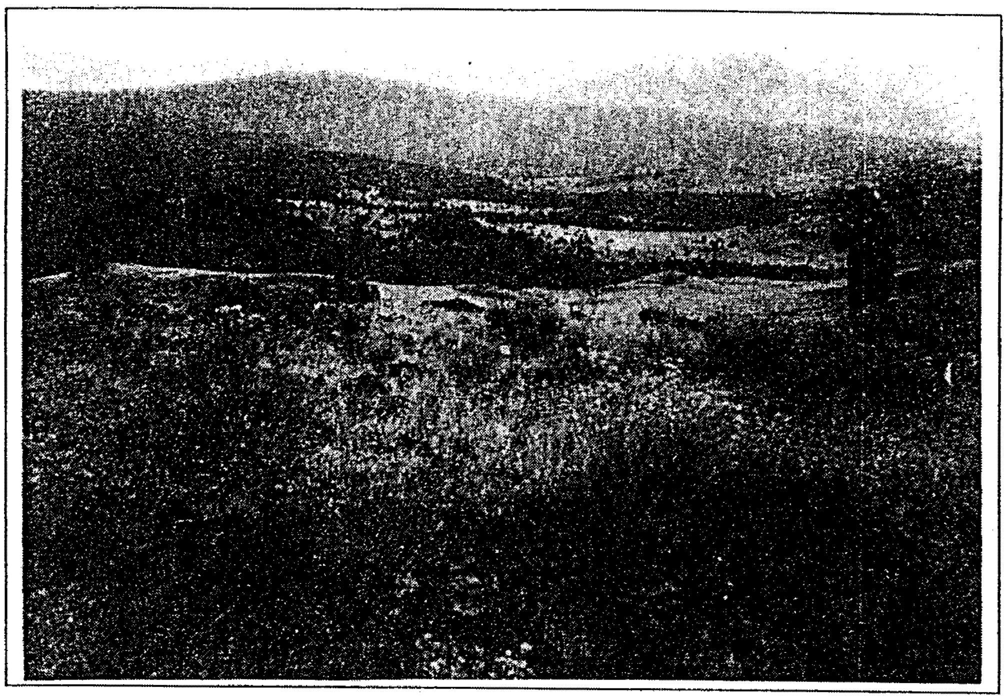
FIGURES

a. View south of Fogg Gulch Scatter (CA-SIS-1160), a chalcedony and jasper prospect and flaked stone working station. The foothill area in photo between the site and Mount Shasta in the distance was the focus of the study.

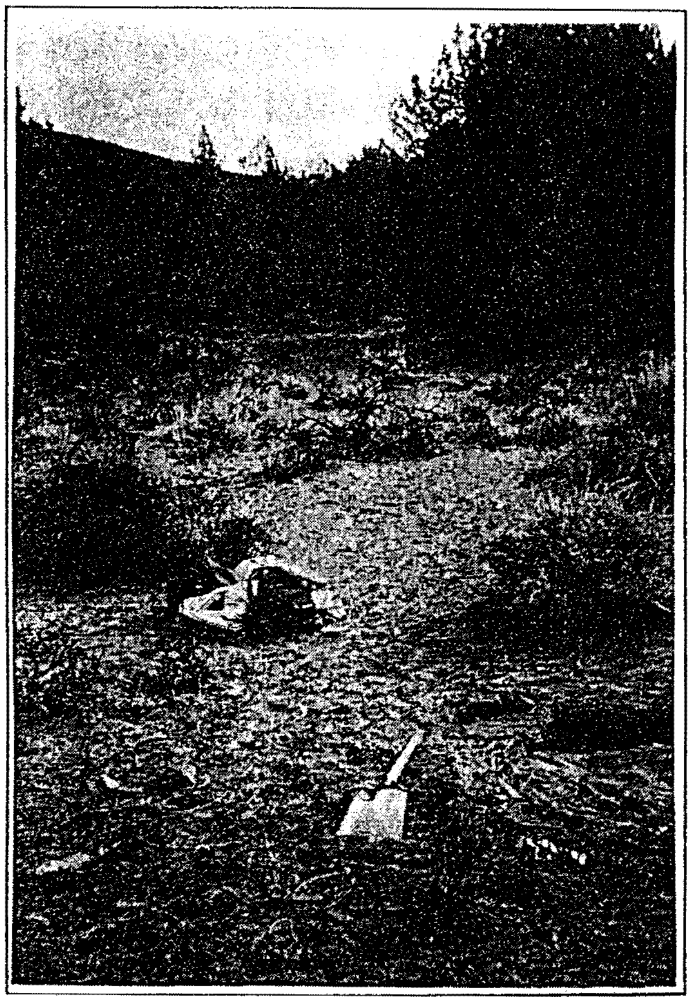
b. View east of Greenwell #4 site (CA-SIS-1274), a lithic scatter. Note small test unit in right foreground.

c. The Cow Wall Site (CA-030-661), a historical rock wall typical of those in the area that were used for livestock control.

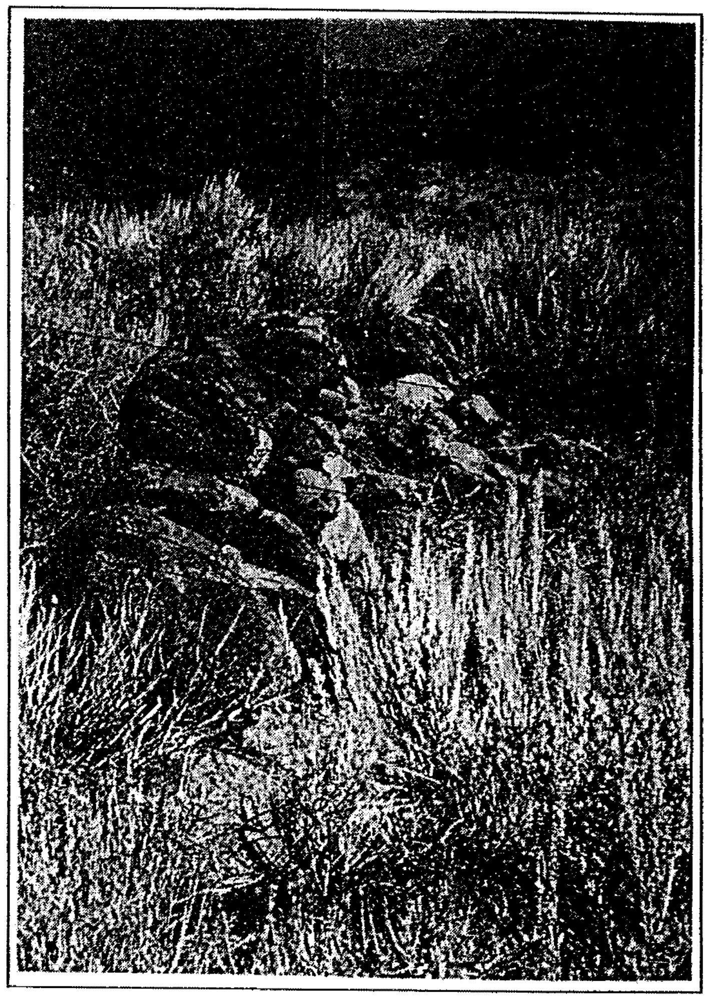
PHOTOGRAPHS



a.



b.



c.

thorough documentation and mapping, and our subsequent analysis of a sample of the contents, we feel, is sufficient to garner an understanding of the place of these sites in the various cultural systems in which they operated. We have a sample of materials from most of these sites, always when obsidian was present, from which future researchers could pursue more studies. Furthermore, disposal of these sites would probably not lead to any degradation beyond what is happening today with cattle grazing and natural processes, except perhaps in a few cases.

Prehistoric occupation or residential sites remaining within the APE include the Mossy Juniper site (CA-030-680) and Whizzing Bird site (CA-030-706). Each site contains a subsurface, albeit probably shallow, midden deposit. The extent of the midden is unknown, although undoubtedly not much larger than the extent of surface materials. However, at least in the case of Mossy Juniper, there are patches of midden present within the larger site and patches of non-midden surface artifact scatters. Because there has not been an adequate testing of the subsurface components of these sites for purposes of full evaluation within the framework of a site-specific and regional research design, we consider these sites to be potentially eligible for listing on the National Register of Historic Places due to their scientific values following 36 CFR 60.4 (d). Our management recommendations are made under this assumption.

Two sites include above-ground rock features that may have served as hunting blinds. These sites are in relatively close proximity to each other, one being a singular feature and the other containing three adjoining features. These features are in good condition and have been drawn and photographed. There are no associated artifacts except for a small piece of wood and, while lichen growth and weathering suggest some antiquity, local rancher Brice Martin, Jr. indicated to us that they were constructed by local settler descendants early in the 20th century for hunting coyotes. In any case, these are not particularly complex features, they lack scientific complexity and further research value, and they do not appear connected to other nearby sites. Such features are rather commonplace in northeastern California, although they may have served disparate functions. We do not consider these sites to possess National Register of Historic Places quality.

Another rock feature of the landscape that was documented during the inventory is the rock wall, features of varying lengths and quality of construction. Many of these features cross from public land onto private land. These features in most cases served to channel livestock, most likely sheep at first and, perhaps later, cattle, and were constructed mainly by the Portuguese in the later half of the 19th century. In some circumstances these fences have juniper inserted posts and barbed wire. In cases these features are discontinuous along a ridge often taking advantage of natural escarpments and outcrops to prevent livestock access. These features are extremely common in much of Siskiyou County and are often illustrated on recent topographic maps. They are not particularly elaborate in their construction compared to some of the wall systems in Butte County, for instance. While some of the segments recorded overall are relatively long, they are generally not complex in terms of connecting walls, gate features, and/or variation in the wall itself. Generally, there are few artifacts to be found in association. One wall in Section 2 of Township 43N, Range 4W (Figure 3) appears to be breached by the historically important Yreka Trail. Overall, these walls are not directly associated with events that have made a significant contribution to the broad patterns of our history (Criterion A); they are not associated with the lives of significant persons (Criterion B); they are not distinct architecturally (Criterion C); nor do they contain information important to history (Criterion D) that has not already been documented in the recording process. Subsequently, they do not appear to be eligible for listing on the National Register of Historic Places.

Aside from historical period trails, the remaining historical sites include the Sterchi Scatter (CA-030-677) and the Graffiti site (CA-030-707). Each of these sites appears to date to the early 1900s. The first site is a light scatter of tin cans within the Shasta Valley which was apparently dumped here by a homesteader. The second site is a stockman's camp of low integrity, probably from 1908 based on graffiti. This site has a scatter of historical refuse indicative of tobacco and liquor use, and food consumption from cans. Window glass suggests there may have been a small structure here, but no foundations were found. A stone wall, similar to those discussed above, is also present. Both of these sites are of low integrity. Neither demonstrates any promise for scientific study as most information has already been gathered in the site documentation process. These are not large sites. We do not know who was associated with the sites and they do not contribute much to our understanding of ranching and agricultural history within the valley. These are sites from nameless or "average" inhabitants of the region reflecting day-to-day activities related to ranching/homesteading. Neither site is believed to contain characteristics that would make it eligible for listing on the National Register of Historic Places when considering integrity issues and the historical context discussion previously presented.

The last group of sites to be discussed is the various historical trails. The Yreka Trail is considered part of the California Trail and has been included in The National Trails System Act. While it has not been formally nominated to the National Register of Historic Places, at least portions of this trail would comprise contributing segments (see previous discussion on this trail). We believe that the segments in Township 43N, Range 3W, Section 18 and Township 43N, Range 4W, Section 2 (Class 1-3) would be contributing segments. The portion in Township 43N, Range 4W, Section 4 we believe lacks integrity since it is difficult or impossible to define here in this parcel. This segment is not considered worthy for nomination to the National Register of Historic Places.

Within the last mentioned parcel there is a 300 foot segment of road that appears in Class 1 condition. We believe that this is the Pitts River Road or Yreka to Fall City Road dating from at least 1856 (Figure 22). It is also illustrated on the 1882 GLO plat. This is a connecting route over Military Pass and intersects with segments of the Military Pass Road that have been recently nominated to the National Register of Historic Places by the Shasta-Trinity National Forest (Julie Cassidy, personal communication 1996). However, for much of southeastern Shasta Valley these routes appear to have paralleled one another with the earlier and more significant route on the north side passing along the south edge of Sheep

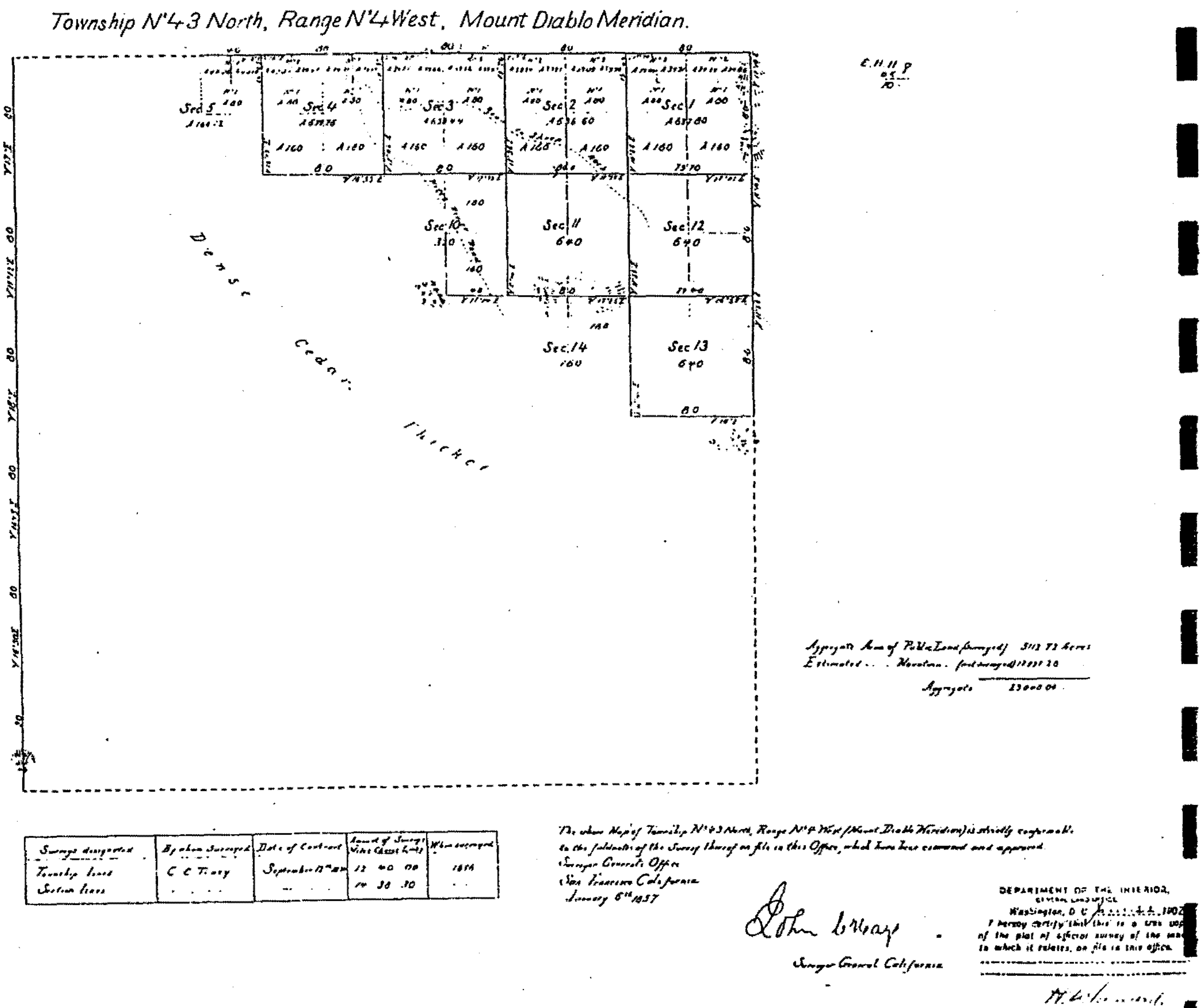


Figure 22: GLO Plat Showing Historical Trail

Rock. So little is known about this freight/travel road that was eventually subsumed by the Sacramento River Canyon route. Except for the relatively light travel between Shasta Valley and Fall River Valley and points beyond, its overall importance is difficult to judge, especially when only 300 feet of a multi-mile route is involved. Furthermore, we cannot be certain that this is the exact Pitts River or Yreka to Fall City Road. Local trail historian Richard Silva of Yreka (personal communication 1996) believes it could also be an early connecting road to Louie Road/Trail to the south. Aside from this very small segment in Section 4, vast portions of this Pitts River route are apparently obliterated in this portion of the Shasta Valley. We do not feel that this small segment, despite its relatively undisturbed condition, is sufficiently present to be considered eligible for the National Register of Historic Places because the overall route in Shasta Valley has low integrity. In any case, we have documented this segment through the site record process including taking measurements and photographs. Its interpretive value is judged to be low. The adjoining California Trail-Yreka Trail, on the other hand, has much higher significance with regards to early travel and transportation and to eventual interpretation.

The final trail for consideration is the Charlie Haight (Martin) Cattle Trail. A nearby route that runs along the Yreka Trail below Sheep Rock is the Louie/Hart/Mills Cattle Trail which we have not evaluated since this parcel was dropped from the APE. This is a trail still in use that dates back to the late 1800s. The integrity of the trail in its historic state is largely lost due to present-day off-road recreational vehicle use and blading. It served several ranches in their cattle drives and is only one of many such routes in Shasta Valley. Two other routes in this eastern valley are the above mentioned Louie/Hart/Mills Trail and the Ball Mountain Road route which took many more cows than those mentioned above from Shasta Valley to upper elevations during the summer months. The Martins and Haights are historic families in the Shasta Valley as mentioned previously, two of many pioneer valley families. The trail is not pristine, although the general route has exhibited continuous use for over 100 years. Section 2 contains an older segment that may have been bladed in early times, but it is relatively distinct and has been unused for an unknown period of time.

Cattle ranching was, and is, important to the economy of this region, but the trail and its use do not particularly contribute to broad patterns of our history (Criterion A). There is no research value to this trail beyond what has already been gleaned from recording its history and characteristics in the site record and this report. It is one of many cattle trails in the region used by several of many pioneer families. Brice Martin, Sr. does not see this trail as particularly important to the local history. It has historic interest but does not appear to be worthy of nomination to the National Register of Historic Places.

Recommendations

Based on the above evaluation, the archaeological and historical values around Sheep Rock do warrant retention in federal ownership. Nearby Section 2 contains a pristine segment of the Yreka Trail with the parcel recommended to be either retained in federal ownership (BLM or Forest Service) or else by incorporating a 100-foot-wide right-of-way placed on either side of the trail in this parcel. This right-of-way should either be retained by BLM or, better, transferred to a historic group such as the Siskiyou County Historical Society or the Oregon-California Trails Association, or both in conjunction. This parcel should not be removed from federal ownership until such a right-of-way has been implemented.

The two midden sites, one in Township 45N, Range 4W, Section 34 along Walbridge Gulch (Mossy Juniper) and the other in Township 44N, Range 4W, Section 22 (Whizzing Bird), should be safeguarded by protective restrictions on the title (e.g., deed restrictions to be conveyed from owner to owner) in terms of five acre aliquot parts with the site near the center of the aliquot part that has the restriction placed on it. As part of the deed restriction, access to California State University Chico, or Southern Oregon College for scientific research (with landowner consent) should be allowed. We feel that this would provide adequate protection as long as the new landowner agrees to do so in principle. These are recognized as good faith agreements. Anticipated future uses of the area around these sites is not expected to change from the current grazing, although the spring by the Whizzing Bird site has been developed in the past. However, any future development would be above the site boundaries.

Overall, it is our contention that this detailed inventory, analysis and evaluation of the various parcels and sites has allowed for a broad perspective on what has culturally occurred here on the landscape over time and how important or unimportant various remnants of these activities are with regard to both prehistoric and historical uses. We also recognize that one of the cornerstones of this region, Sheep Rock, has historical and spiritual values to various peoples today. This was a landmark to both Native American and Euroamerican peoples, one of the most important landmarks in Siskiyou County, if not the north State. We only hope that this work can serve a variety of needs and concerns, be they historical, religious, management oriented, educational, or otherwise.

REFERENCES CITED

Aikens, C. M.

1970 *Hogup Cave*. University of Utah Anthropological Papers 93. Salt Lake City.

1985 The Nightfire Island Lakeshore Adaptation in the Broader Context of Desert West Prehistory. In *Nightfire Island: Later Holocene Lakemarsh Adaptation on the Western Edge of the Great Basin,* by C. G. Sampson, pp. 519-528. University of Oregon Anthropological Papers 33. Eugene.

Arnold, K.

1995 The Lonesome Route. Ms. on file, Bureau of Land Management, Redding Field Office, Redding.

Bamforth, D.

1986 Technological Efficiency and Tool Curation. *American Antiquity* 51(1):38-50.

1991 Technological Organization and Hunter-Gatherer Land Use: A California Example. *American Antiquity* 56(2):216-234.

Banks, K. M.

1984 Flaked Stone Artifacts. Appendix G, In *Archaeological Investigations in the Sacramento River Canyon, Volume I: Report of Testing at Seven Aboriginal Sites* by C. M. Raven, S. K. Goldberg, M. J. Moratto, and K. M. Banks. Submitted to California Department of Transportation, Sacramento by INFOTEC Development Inc., Sonora.

Barrett, S. A.

1910 *The Material Culture of the Klamath Lake and Modoc Indians of Northeastern California and Southern Oregon.* University of California Publications in American Archaeology and Ethnology 5(4). Berkeley.

Basgall, M.

1989 Obsidian Acquisition and Use in Prehistoric Central Eastern California: A Preliminary Assessment. In *Current Directions in California Obsidian Studies*, edited by R. E. Hughes, pp. 111-126. Contributions of the University of California Archaeological Research Facility. Berkeley.

1993 *The Archaeology of Nelson Basin and Adjacent Areas, Fort Irwin, San Bernardino County, California.* Submitted to the U.S. Army Corps of Engineers, Los Angeles District Office, California.

Basgall, M., and W. Hildebrandt

1989 *Prehistory of the Sacramento River Canyon, Shasta County, California.* Center for Archaeological Research at Davis, Publication Number 9. University of California, Davis.

Baumhoff, M. A.

1957 *An Introduction to Yana Archaeology*. University of California Archaeological Survey Report 40. Berkeley.

1978 Environmental Background. In *California*, edited by R. F. Heizer, pp. 16-64. Handbook of North American Indians, vol. 8, W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

1985 North Coast Range Point Types. In *Ethnography and Prehistory of the North Coast Range, California*, edited by H. McCarthy, W. Hildebrandt, and L. Swenson, pp. 172-214. Center for Archaeological Research at Davis Publication No. 8. University of California, Davis.

Baumhoff, M. A., and J. S. Byrne

1959 Desert Side Notched Points as a Time Marker in California. *University of California Archaeological Survey Report* 48:32-65. Berkeley.

Bedwell, S. F.

1970 *Prehistory and Environment of the Pluvial Fort Rock Lake Area of South Central Oregon*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

Bernbeck, Reinhard

1991 Crises in the Foraging Mode of Production: Long-Term Cyclical Processes in Hunter-Gatherer Societies. In *Foragers in Context, Long-Term, Regional, and Historical Perspectives in Hunter-Gatherer Studies*, edited by P. T. Miracle, L. E. Fisher, and J. Brown, pp. 47-62. Michigan Discussions in Anthropology Vol. 10. Ann Arbor.

Binford, L.

1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35(3):255-273.

1980 Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.

California, State of

1982 *California Historical Landmarks* (updates to 1995). State Office of Historic Preservation, Sacramento.

Clewett, S. E.

1968 Original unpublished field notes from the Chaney Site, Siskiyou County. Ms. on file, Shasta College Archaeology Laboratory, Redding, California.

Clewett, S. E., and E. Sundahl
1982 *Clikapudi Archaeological District: 1981 Field Research.* Shasta College Archaeology Laboratory, Redding. Submitted to USDA Forest Service, Shasta-Trinity National Forest, Redding.

1983 *Archaeological Excavations at Squaw Creek, Shasta County, California.* Shasta College Archaeology Laboratory, Redding, California. Submitted to USDA Forest Service, Shasta-Trinity National Forest, Redding.

1989 A View from the South: Connections Between Southwest Oregon and Northern California. In *The Proceedings of the 1989 Symposium on the Prehistory of Southwest Oregon,* edited by N. Hannon and R. K. Olmo, pp. 37-45. Medford, Oregon.

Connolly, T. J.
1986 *Cultural Stability and Change in the Prehistory of Southwest Oregon and Northern California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

1988 A Culture-Historical Model for the Klamath Mountain Region of Southwest Oregon and Northern California. *Journal of California and Great Basin Anthropology* 10(2):246-260.

1989 Cultural Stability and Change in Southwest Oregon and Northern California: An Approach to Identifying Diagnostic Assemblage Types. In *Proceedings of the 1989 Symposium on the Prehistory of Southwest Oregon,* edited by N. Hannon and R. K. Olmo, pp. 56-62. Medford, Oregon.

Crebbin, H. R.
1988 The Rohrer Family and Ranch. *The Siskiyou Pioneer* 6(1):1-3. Yreka, California.

Cressman, L. S.
1940 Studies on Early Man in South Central Oregon. *Carnegie Institution of Washington Year Book* 39:300-306. Washington, D.C.

1942 *Archaeological Researches in the Northern Great Basin.* Carnegie Institution of Washington Publication 538. Washington, D.C.

Curtis, E. S.
1924 *The North American Indian* 8. Johnson Reprint, New York.

Delacorte, M. G., M. C. Hall, and M. E. Basgall
1994 *Report on the Evaluation of Twelve Archaeological Sites in the Southern Owens Valley, Inyo County, California.* Submitted to the California Department of Transportation, Sacramento.

Delacorte, M. G., and W. Hildebrandt
1994 *A Research Design for the Evaluation and Treatment of Archaeological Sites along the Tuscarora Gas Transmission Pipeline between Malin, Oregon and Tracy, Nevada.* Submitted to Tuscarora Gas Transmission Company, Reno, Nevada.

Delacorte, M. G., and K. R. McGuire
1993 *Report of Archaeological Test Evaluations at 23 Sites in Owens Valley, California.* Submitted to Contel of California, Inc. and the U.S. Department of the Interior, Bureau of Land Management, Riverside.

Dewar, R. E., and K. A. McBride
1992 Remnant Settlement Patterns. In *Space, Time and Archaeological Landscapes,* edited by J. Rossignol and L. Wandsnider, pp. 227-257. Plenum Press, New York.

Dillon, R.
1975 *Siskiyou Trail: The Hudson's Bay Company Route to California.* McGraw-Hill, New York.

Dixon, R. B.
1907 *The Shasta.* Bulletin of the American Museum of Natural History 17(5):381-498. New York.

Dotta, J.
1964 *The Salvage Archaeology of Sha-237, Shasta County, California.* Submitted to California State Department of Parks and Recreation, Sacramento.

Dotta J., and R. Hullinger
1964 *The Salvage Archaeology of a Wintu Fishing Station, Shasta 207, Shasta County, California.* Submitted to California Department of Parks and Recreation, Sacramento.

Dreyer, W.
1984 *Prehistoric Settlement Strategies in a Portion of the Northern Sacramento Valley, California.* Unpublished Master's thesis, Department of Anthropology, California State University, Chico.

Dreyer, W., and M. Kowta
1986 *Phase II Investigations at CA-PLU-226, Mohawk Valley, Plumas County, California.* Department of Anthropology, California State University, Chico. Submitted to the California Department of Transportation, Division of Transportation Planning, Sacramento.

Elston, R. G.
1982 Good Times, Hard Times: Prehistoric Culture Change in the Western Great Basin. In *Man and Environment in the Great Basin,* edited by D. B. Madsen and J. F. O'Connell, pp. 186-206. Society for American Archaeology Papers 2.

1986 Prehistory of the Western Area. In *Great Basin,* edited by W. L. D'Azevedo, pp. 435-465. Handbook of North American Indians, vol. 11, W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Foster, A. E.
1982 *The Salvage Excavation of a Portion of CA-SHA-501, Shasta County, California.* Submitted to City of Redding, California.

Fredrickson, D. A.
1973 *Early Cultures of the North Coast Ranges, California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

1984 The North Coastal Region. In *California Archaeology,* edited by M. J. Moratto, pp. 471-527. Academic Press, Orlando.

Gamble, C.
1991 An Introduction to the Living Spaces of Mobile Peoples. In *Ethnoarchaeological Approaches to Mobile Campsites,* edited by C. B. Gambel and W. A. Boismier, pp. 1-24. International Monographs in Prehistory, Ethnoarchaeological Series 1. Ann Arbor, Michigan.

Gates, G.
1983 *Cultural Resource Overview Modoc National Forest.* Report on file, Supervisors Office, Modoc National Forest, Alturas, California.

Gilreath, A., W. W. Bloomer, T. L. Ozbun, J. Fagan, and D. Wilson
1995 The Distribution and Use of Medicine Lake Obsidian. Paper presented at 29th Annual Meeting of the Society for California Archaeology, Eureka.

Gilreath, A. J., and W. R. Hildebrandt
1993 *Draft Final: Prehistoric Use of the Coso Volcanic Field: Data Recovery Investigation.* Submitted to the Geothermal Branch, China Lake Naval Weapons Center, China Lake, California.

Goodyear, A. C.
1979 A Hypothesis for the Use of Cryptocrystalline Raw Material Among Paleo-Indian Groups of North America. *Research Manuscript Series No. 156,* Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

Gould, R. A., and S. Saggers
1985 Lithic Procurement in Central Australia: A Closer Look at Binford's Idea of Embeddedness in Archaeology. *American Antiquity* 50(1):117-136.

Grayson, D. K.
1976 The Nightfire Island Avifauna and the Altithermal. In *Holocene Environmental Change in the Great Basin*, edited by R. Elston, pp. 74-102. Nevada Archaeological Survey Report No. 6. Reno.

Gruhn, R.
1961 *The Archaeology of Wilson Butte Cave, South Central Idaho.* Occasional Papers of the Idaho State College Museum 6. Pocatello.

Hamusek, B. J.
1993 *What X Equals: The Archaeological and Geological Distribution of "Source X" Tuscan Obsidian in Northern California.* Unpublished Master's thesis, Department of Anthropology, California State University, Chico.

Hamusek, B., E. W. Ritter, and J. A. Burcell
1996 *A Cultural Resource Survey of Eastern Shasta Valley, Siskiyou County, California.* Submitted to the Bureau of Land Management, Redding.

Hardesty, D. L., and S. Fox
1974 *Archaeological Investigations in Northern California.* Nevada Archaeological Survey Research Paper No. 4. Reno.

Hayden, B.
1994 Competition, Labor, and Complex Hunter-Gatherers. In *Key Issues in Hunter-Gatherer Research*, edited by E. S. Burch, Jr. and L. J. Ellanna, pp. 223-242. Berg Publishers, Oxford, England.

Heizer, R. F.
1942 Massacre Lake Cave, Tule Lake Cave and Shore Sites. In *Archaeological Researchers in the Northern Great Basin*, edited by L. S. Cressman et al., pp. 121-134. Carnegie Institution of Washington Publication 538. Washington, D.C.

Heizer, R. F., and M. A. Baumhoff
1961 *The Archaeology of Two Sites at Eastgate, Churchill County, Nevada. I Wagon Jack Shelter.* University of California Anthropological Records 20:119-149. Berkeley.

1970 Big Game Hunters in the Great Basin: A Critical Review of the Evidence. In *Papers on the Anthropology of the Western Great Basin*, pp. 1-12. University of California Archaeological Research Facility Contributions 7. Berkeley.

Heizer, R. F., and T. R. Hester
1970 *Shasta Villages and Territory.* University of California Archaeological Research Facility 9. Berkeley.

1978 *Great Basin Projectile Points: Forms and Chronology.* Ballena Press, Socorro, New Mexico.

Helfrich, D.
1949 Trail, Road, and Transportation History of Butte Valley. *The Siskiyou County Historical Society Yearbook* 2(9):1-7. Yreka, California.

Hester, T. R.
1973 *Chronological Ordering of Great Basin Prehistory.* Contributions of the University of California Archaeological Research Facility 17. Berkeley.

Hildebrandt, W. R., and J. F. Hayes
1984 *Archaeological Investigations on Pilot Ridge, Six Rivers National Forest.* Submitted to Six Rivers National Forest, Eureka, California.

Hildebrandt, W. R., R. G. Atwell, L. Clayton, P. Mikkelsen, M. J. Moratto, R. M. Pettigrew, L. A. Ross, R. F. Schalk, J. J. Sekora, and L. A. Speulda
1995 *Archaeological Investigations PGT-PG&E Pipeline Expansion Project Idaho, Washington, Oregon, and California.* Submitted to Pacific Gas Transmission Company, Portland.

Holt, C.
1946 *Shasta Ethnography.* University of California Anthropological Records 3(4):299-349. Berkeley.

Hoover, E., H. Rensch, and E. Rensch
1966 *Historic Spots in California.* Stanford University Press, Stanford.

Hughes, R. E.
1983 X-Ray Fluorescence Characterization of Obsidian. In *The Archaeology of Monitor Valley, 2: Gatecliff Shelter,* edited by D. H. Thomas, pp. 401-408. Anthropological Papers of the American Museum of Natural History 59(1). New York.

1986 *Diachronic Variability in Obsidian Procurement Patterns in Northeastern California and Southcentral Oregon.* University of California Publications in Anthropology 7. Berkeley.

Hughes, R. E., and R. L. Bettinger
1984 Obsidian and Prehistoric Sociocultural Systems in California. In *Exploring the Limits: Frontiers and Boundaries in Prehistory,* edited by S. P. De Atley and F. J. Findlow, pp. 153-172. British Archaeological Reports International Series 223. Oxford, England.

Jackson, R., M. Boynton, W. Olsen, and R. Weaver
1988 *California Archaeological Resource Identification and Data Acquisition Program: Sparse Lithic Scatters.* Office of Historic Preservation, Sacramento.

Jensen, P. M.
1977 *Test Excavations, CA-SHA-543 on East Fork Creek, Shasta County, California.* Submitted to Bureau of Land Management, Redding, California.

1980 *Archaeological Excavations at the Kett Site, CA-SHA-491, Shasta County, California.* On file, Department of Anthropology, California State University, Chico.

Jensen, P. M., and A. E. Farber
1982 *Archaeological Data Recovery Program at CA-SIS-342.* Submitted to California Department of Transportation, Redding.

Johnson, J., and E. Nilsson
1983 *Archaeological Test Excavations at the Meek Site CA-SIS-900.* Mountain Anthropological Research, Chico, California. Submitted to Siskiyou County Department of Public Works, Yreka, California.

Johnson, K. L.
1976 *Test Excavations at the Old Tower House Site (CA-SHA-192), Whiskeytown National Recreation Area, Shasta County, California.* On file, Department of Anthropology, California State University, Chico.

Johnson, K. L., and L. S. Skjelstad

1974 *The Salvage Archaeology of Site 4-SHA-177, Whiskeytown Recreation Area, Shasta County, California.* Submitted to Pacific Gas and Electric Company, San Francisco.

Johnson, L.

1969a Obsidian Hydration Rate for the Klamath Basin of California and Oregon. *Science* 165:1345-1356.

1969b *The Klamath Basin Archaeological Project.* Report on file, Museum of Natural History, University of Oregon, Eugene, Oregon.

Kelly, R. L.

1983 Hunter-Gatherer Mobility Strategies. *Journal of Anthropological Research* 39(3):277-306.

1985a *Hunter-Gatherer Mobility and Sedentism: A Great Basin Study.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Michigan, Ann Arbor, Michigan.

1985b Hunter-Gatherer Mobility and Lithic Technology. Paper presented at 50th Annual Meeting of the Society for American Archaeology, Denver.

1988 The Three Sides of a Biface. *American Antiquity* 53(4):717-734.

1992 Mobility/Sedentism: Concepts, Archaeological Measures, and Effects. *Annual Review of Anthropology* 21:43-66. Stanford.

Kelly, M. S., E. Nilsson, and J. H. Cleland

1987 *Archaeological Investigations at Lake Britton, California, Pit 3, 4, and 5 Project (License No. 233) Archaeological Site Testing - Volume 1 and 2.* Wirth Environmental Services. Submitted to Pacific Gas and Electric Company, San Francisco. Contract No. Z-16-0051-85.

Kim, C. K., and H. R. Blank

1970 *Bouguer Gravity Map of California, Weed Sheet.* California Division of Mines and Geology. Sacramento.

King, G.

1995 Late Quaternary Paleolakes of Butte Valley, Siskiyou County, California. *The California Geographer* 34:41-56.

Kroeber, A. L.
1925 *Handbook of the Indians of California.* United States Bureau of American Ethnology, Bulletin 78. Smithsonian Institution, Washington, D.C.

LaLande, J.
1983 *First Over the Siskiyous, A Commentary on Peter Skene Ogden's 1826-1827 Route of Travel Through Northern California and Southwestern Oregon.* Submitted to the Rogue River National Forest, Medford, Oregon.

1989 The Indians of Southwest Oregon: An Ethnohistorical Review. *The Proceedings of the 1989 Symposium on the Prehistory of Southwest Oregon*, edited by N. Hannon and R. K. Olmo, pp. 95-119. Medford, Oregon.

Lanning, E. B.
1963 *Archaeology of the Rose Spring Site INY-372.* University of California Publications in American Archaeology and Ethnology 49(3):237-336. Berkeley.

Layton, T. N.
1970 *High Rock Archaeology: An Interpretation of the Prehistory of the Northwestern Great Basin.* Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University.

Lee, R. B., and I. DeVore
1968 *Man the Hunter.* Aldine Publishing Company, Chicago.

Leonhardy, F. C.
1967 *The Archaeology of a Late Prehistoric Village in North-Western California.* University of Oregon, Museum of Natural History Bulletin 4. Eugene, Oregon.

Lueke, M.
1982 Place Names. *The Siskiyou Pioneer* 5(5). Yreka, California.

McGuire, K.
1985 *Test Excavations at Sheepy East I, Lower Klamath Lake, Siskiyou County, California.* Submitted to the Bureau of Reclamation, Sacramento.

Macdonald, G. A.
1966 Geology of the Cascade Range and Modoc Plateau. In *The Geology of Northern California*, edited by E. H. Bailey, pp. 63-96. California Division of Mines and Geology Bulletin 90. San Francisco.

Mack, J. M.

1982 *Archaeological Investigations of the Salt Cave Locality, Klamath River, Oregon.* University of Oregon Anthropological Papers 27. Eugene, Oregon.

1989 Archaeology of the Upper Klamath River. In *The Proceedings of the 1989 Symposium on the Prehistory of Southwest Oregon*, edited by N. Hannon and R. K. Olmo, pp. 7-9. Medford, Oregon.

1991 *Klamath River Canyon Prehistory and Ethnology.* Submitted to the Bureau of Land Management, Portland.

Maloney, A. B.

1945 *Fur Brigade to the Bonaventura, John Work's California Expedition 1832-1833 for the Hudson Bay Company.* California Historical Society, San Francisco.

Mehringer, P. J.

1985 Late-Quaternary Pollen Records from the Interior Pacific Northwest and Northern Great Basin of the United States. In *Pollen Records of Late Quaternary North American Sediments*, edited by V. A. Byrant and R. G. Holloway, pp. 167-189. American Association of Stratigraphic Palynologists, Dallas.

Meighan, C. W.

1955 *Archaeology of the North Coast Ranges, California.* University of California Archaeological Survey Report 30:1-39. Berkeley.

Meltzer, D. J.

1984 On Stone Procurement and Settlement Mobility in Eastern Fluted Point Groups. *North American Archaeologist* 6(1):1-24.

Merriam, C. H.

1926 Source of the Name Shasta. *Journal of the Washington Academy of Sciences* 16(19):522-525.

Merrill, F.

1957 Butte Valley As It Was. *The Siskiyou Pioneer* 11(9):8-11. Yreka, California.

Molter, J.

1996 Unpublished field reports regarding botanical surveys in Shasta Valley. Ms. on file with the Bureau of Land Management, Redding.

Muir, J.

1918 *Steep Trails.* Houghton Mifflin Company, Boston.

Murray, K. A.

1959 *The Modocs and Their War.* University of Oklahoma Press, Norman, Oklahoma.

Newlun, J. J., W. C. Lindsey, J. J. Jahnke, and L. A. Day

1983 *Soil Survey of Siskiyou County, California, Central Part.* United States Department of Agriculture, Soil Conservation Service, Washington, D.C.

Nicholson , A., and S. Cane

1991 Desert Camps: Analysis of Australian Aboriginal Protohistoric Campsites. In *Ethnoarchaeological Approaches to Mobile Campsites*, edited by C. S. Gamble and W. A. Boismier, pp. 263-354. International Monographs in Prehistory Ethnoarchaeological Series I, Ann Arbor, Michigan.

Nilsson, E.

1985a *Artifact Variation as a Measure of Cultural Affinity: A Study of Surface Lithic Assemblages from Shasta and Modoc Indian Territories, California.* Unpublished Master's thesis, Department of Anthropology, California State University, Los Angeles.

1985b *Archaeological Test Excavations at CA-SIS-1088, Siskiyou County, California.* Mountain Anthropological Research, Chico, California. Submitted to Siskiyou County Department of Works, Yreka, California.

1987 *Draft: Archaeological Test Excavations at CA-SIS-154, CA-SIS-1103, and CA-SIS-1105, Siskiyou County, California.* Mountain Anthropological Research, Chico, California. Submitted to Siskiyou County Department of Public Works, Yreka, California.

1988 *Archaeological Test Excavations at the Ager III Sites CA-SIS-331, CA-SIS-332, CA-SIS-1281, and CA-SIS-1282, Siskiyou County, California.* Mountain Anthropological Research, Chico, California. Submitted to Siskiyou County Department of Public Works, Yreka, California.

1991 Coming of Age: Archaeological Research within Shasta Valley, Siskiyou County, California. Paper presented at the 25th Annual Meeting of the Society for California Archaeology, Sacramento.

Nilsson E., K. M. Banks, and G. Greenway

1989 *Archaeological Data Recovery Investigations at CA-SIS-900: A Late Prehistoric Site in Shasta Valley, California.* Mountain Anthropological Research, Chico, California. Submitted to Siskiyou County Department of Public Works, Yreka, California.

Nilsson, E., K. L. Hull, and R. Bevill
1996 *Archaeological Inventory of the Proposed Orwick Land Exchange, Scott Mountain, Siskiyou County, California.* Submitted to the Bureau of Land Management, Redding.

O'Connell, J.
1970 *The Archaeology and Cultural Ecology of Surprise Valley, Northeast California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Berkeley.

Pippin, L. C., J. O. Davis, E. Budy, and R. Elston
1979 *Archaeological Investigations at the Pike's Point Site (4-LAS-537), An Analysis of Prehistoric Artifacts from Lassen National Forest, California.* Submitted to Lassen National Forest, Susanville.

Powers, S. A.
1976 *Tribes of California.* Reprinted. University of California Press, Berkeley. Originally published 1877, United States Department of the Interior, Geographical and Geological Survey of the Rocky Mountain Region, Contributions to North American Ethnology III. Washington, D.C.

Price, T. D., and J. A. Brown
1985 *Prehistoric Hunter-Gatherers, The Emergence of Cultural Complexity.* Academic Press, San Diego.

Raven, C.
1984 Northeastern California. In *California Archaeology*, edited by M. J. Moratto, pp. 431-470. Academic Press, New York.

Ray, V. F.
1963 *Primitive Pragmatists: The Modoc Indians of California.* University of Washington Press, Seattle.

Renfrew, C.
1977 Alternative Models for Exchange and Spatial Distribution. In *Exchange Systems in Prehistory*, edited by T. K. Earle and J. E. Ericson, pp. 71-89. Academic Press, New York.

Riley, J. W.
1988 The Little Town O'Tailholt. *The Siskiyou Pioneer* 6(11):91. Yreka, California.

Ritter, E.
1984 Original unpublished field notes from the Sheep Rock Shelter. Ms. on file, Bureau of Land Management, Redding Field Office, Redding.

1989 *Sheep Rock Shelter (CA-SIS-266): Archaeological Test Excavations in Shasta Valley.* Cultural Resources Report, Archaeology. Bureau of Land Management, Redding.

Rogers, R.
1996 *A Mineral Potential Determination of the Selected Federal Lands in Siskiyou County to be Used in the ALC Exchange and for Use in Any Future Land Exchanges.* Submitted to the Bureau of Land Management, Redding.

Rossignol, J., and L. Wandsnider
1992 *Space, Time, and Archaeological Landscape.* Plenum Press, New York.

Sampson, C. G.
1985 *Nightfire Island: Later Holocene Lakemarsh Adaptation on the Western Edge of the Great Basin.* University of Oregon Anthropological Papers 33. Eugene.

Shackley, M. S.
1985 Lithic Raw Material Procurement and Hunter-Gatherer Mobility Strategies in the Southwest Archaic. Paper Presented at the 50th Annual Meeting of the Society for American Archaeology, Denver.

1986 Diachronic and Spatial Variability of Obsidian Procurement in the American Southwest, A Trace Element Exploration of Southwest Obsidian Sources. Paper Presented at the 51st Annual Meeting of the Society for American Archaeology, New Orleans.

1987 *US Sprint Fiber Optic Cable Project Oroville California to Eugene Oregon: Archaeological Testing of Four Sites in California: CA-BUT-5, CA-TEH-1468, CA-SHA-1684, CA-SIS-342.* Dames and Moore, San Diego. Submitted to US Sprint.

1990 *Early Hunter-Gatherer Procurement Ranges in the Southwest: Evidence from Obsidian Geochemistry and Lithic Technology.* Unpublished Ph.D. dissertation, Department of Anthropology, Arizona State University, Tempe.

Shott, M.
1986 Technological Organization and Settlement Mobility: An Ethnographic Examination. *Journal of Anthropological Research* 42:15-51.

Silva, R.
1995 History of the Yreka Trail. Paper presented to the Siskiyou County Historical Society, Yreka.

Silver, S.
1978 Shastan Peoples. In *California,* edited by R. F. Heizer, pp. 211-224, Handbook of North American Indians, vol.8, W. C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Skinner, E. J., J. L. Fagan, and P. W. Ainsworth
1989 Lithic Landscape: Technological Constraints of Size, Shape, and Amount of Cortex. Paper presented at the 47th Plains Anthropological Conference, Sioux Falls, South Dakota.

Smith, C. E., and W. E. Weymouth
1952 *Archaeology of the Shasta Dam Area, California.* University of California Archaeological Survey Reports 18. Berkeley.

Spier, L.
1930 *Klamath Ethnography.* University of California Publications in American Archaeology and Ethnology, Vol. 30. Berkeley.

Squire, R. J.
1956 *Recent Excavations and Survey in Northeastern California.* University of California Archaeological Reports 33. Berkeley.

Squire, R. J., and G. L. Grosscup
1952 *An Archaeological Survey of the Lava Beds National Monument, California.* Report on file, Lava Beds National Monument, Tule Lake, California.

1954 *Preliminary Report of Archaeological Excavations in Lower Klamath Basin.* University of California Archaeological Survey ms. 183. Berkeley.

Stern, T.
1964 Review of "Primitive Pragmatists: The Modoc Indians of Northern California" by V. F. Ray (1963). *American Anthropologist* 66:676.

Sullivan, A. P. III, and K. C. Rozen
1985 Debitage Analysis and Archaeological Interpretation. *American Antiquity* 50(4):755-779.

Sundahl, E.
1982 *The Shasta Complex in the Redding Area, California.* Unpublished Master's thesis, Department of Anthropology, California State University, Chico.

Swartz, B. K., Jr.
1961 *Preliminary Archaeological Survey Along the Proposed Highway, Lava Beds National Monument.* Klamath County Museum, Klamath Falls, Oregon.

1964 *Archaeological Investigations at Lava Beds National Monument, California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Arizona, Tucson.

Theodoratus Cultural Research, Inc.
1981 *Native American Cultural Overview, Shasta Trinity National Forest.* Submitted to USDA Forest Service, Shasta-Trinity National Forest, Redding.

1984 *Ethnographic Inventory for Public Law 95-341 North Central California.* Report submitted to United States Department of Agriculture, Forest Service, Shasta-Trinity National Forest and Mendocino National Forest (Corning and Stonyford Ranger Districts) in cooperation with U.S. Department of Interior, Bureau of Land Management Redding Resource Area, Redding.

1985 *Mapping Project Ethnographic Inventory Shasta-Trinity National Forest, Mendocino National Forest (Corning and Stonyford Ranger Districts), Redding Resource Area, Bureau of Land Management.* Report submitted to United States Department of Agriculture, Forest Service Shasta-Trinity National Forest and Mendocino National Forest (Corning and Stonyford Ranger Districts) and the Bureau of Land Management, Redding (FS Contract #53-9A28-0-3130).

Thomas, D. H.
1981 How to Classify the Projectile Points from Monitor Valley, Nevada. *Journal of California and Great Basin Anthropology* 3:7-43.

1983 *The Archaeology of Monitor Valley: 1. Epistemology.* Anthropological Papers of the American Museum of Natural History, Vol. 58(1). New York.

Torrence, R.
1983 Time-Budgeting and Hunter-Gatherer Technology. In *Prehistoric Hunters and Gatherers in Europe*, edited by G. Bailey, pp. 11-22. Cambridge University Press, New York.

1989 Tools as Optimal Solutions. In *Time, Energy and Stone Tools*, edited by R. Torrence, pp. 1-6. Cambridge University Press, Cambridge.

Treganza, A.
1954 *Salvage Archaeology in Nimbus and Redbank Reservoir Areas, California.* University of California Archaeological Survey Reports 26. Berkeley.

1958 *Salvage Archaeology of the Trinity Reservoir Area, Northern California.* University of California Archaeological Survey Reports 43:1-38. Berkeley.

Treganza, A. E., and M. H. Heickson
1969 Salvage Archaeology in the Black Butte Reservoir Region. *San Francisco State College, Occasional Papers in Anthropology* 2:1-59. San Francisco.

Tyree, K. D.
1992 *Debitage Variation as a Measure of Adaptive Strategy: A Study of Three Lithic Assemblages from Shasta County, California.* Unpublished Master's thesis, Department of Anthropology, California State University, Chico.

U.S. Department of the Interior
1978 *Federal Register.* National Register of Historic Places, Annual Listing of Historic Properties. Washington, D.C.

Van Camp, D.
1984 Stone Fences in Shasta Valley. *The Siskiyou Pioneer* 5(7):108-113. Yreka, California.

Voegelin, E. (Wheeler)
1942 *Culture Element Distributions, XX: Northeast California.* University of California Anthropological Records 7(2):47-252. Berkeley.

Wallace, W. J., and E. S. Taylor
1952 *Excavation of SIS-13, A Rock Shelter in Siskiyou County, California.* University of California Archaeological Survey Reports 15. Berkeley.

Waters, A. C.
1981 Captain Jack's Stronghold: The Geologic Events that Created a Natural Fortress. In *Guides to Some Volcanic Terranes in Washington, Idaho, Oregon, and Northern California,* edited by D. A. Johnston and J. Donnelly-Nolan, pp. 151-155. Geological Survey Circular 838. Department of Interior, Washington, D.C.

Weide, M. L.
1974 North Warner Subsistence Network: A Prehistoric Band Territory. *Nevada Archaeological Survey Research Paper* No. 5, pp. 62-69. Reno.

Wells, Harry L.
1881 *History of Siskiyou County, California.* D. J. Stewart and Co., Oakland, California.

West, G. J.
1989 Late Pleistocene/Holocene Vegetation and Climate. In *Prehistory of the Sacramento River Canyon, Shasta County, California,* by M. E. Basgall and W. R. Hildebrandt, pp. 36-56. Center for Archaeological Research at Davis Publication Number 9. University of California, Davis.

Whistler, K. W.
1977 Wintun Prehistory: An Interpretation Based on Linguistic Reconstruction of Plant and Animal Nomenclature. Paper presented at the Third Annual Meeting of the Berkeley Linguistic Society, University of California, Berkeley.

Willey, G. R., and P. Phillips.
1958 *Method and Theory in American Archaeology.* University of Chicago Press, Chicago.

Williams, H.
1949 *Geology of the Macdoel Quadrangle.* State of California Department of Natural Resources, Division of Mines, Bulletin 151. San Francisco.

Woolfenden, W.
1970 *A Study in Historic Sites Archaeology.* Unpublished Master's thesis, Department of Anthropology, San Francisco State College, San Francisco.

Yesner, D. R.
1994 Seasonality and Resource "Stress" Among Hunter-Gatherers: Archaeological Signatures. In *Key Issues in Hunter-Gatherer Research,* edited by E. S. Burch, Jr., and L. J. Ellanna, pp. 151-168. Berg Publishers, Oxford, England.