HISTORICAL RESOURCES SIGNIFICANCE EVALUATIONS FOR ARCHAEOLOGICAL SITES WITHIN THE CASTLEROCK PROJECT AREA, CITY OF SAN DIEGO

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Submitted to:

Hugh Hewitt
Hewitt and O'Neil
19900 MacArthur Blvd., Suite 1050
Irvine, California 92612

Prepared by:

ASM AFFILIATES, INC.
2034 Corte Del Nogal
Carlsbad, California 92011

Susan M. Hector, Ph.D.
Senior Archaeologist

Catherine A. Wright
Associate Archaeologist

with a section on lithic artifact analysis by:
Mark S. Becker, Ph.D., Senior Archaeologist

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Keywords: SDI-4353, SDI-4354, SDI-10054, SDI-14288, SDI-16904, Sparse Lithic Scatter, La Mesa USGS Topographic Quadrangle

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NATIONAL ARCHAEOLOGICAL DATABASE INFORMATION

Authors: Susan M. Hector and Catherine A. Wright
ASM Affiliates, Inc.
543 Encinitas Boulevard, Suite 114
Encinitas, California 92024

Date: May 2006

Title: Historical Resources Significance Evaluations for Archaeological Sites within the Castlerock Project Area, City of San Diego

Submitted by: ASM Affiliates, Inc.
543 Encinitas Boulevard, Suite 114
Encinitas, California 92024

Submitted to: Hugh Hewitt
Hewitt and O'Neil
19900 MacArthur Boulevard, Suite 1050
Irvine, CA 92612

Map: La Mesa 7.5' USGS Topographic Quadrangle
Township 15S, Range 1W, unsectioned rancho land (El Cajon)

Acreage: 183.8

Keywords: SDI-4353, SDI-4354, SDI-10054, SDI-14288, SDI-16904, Sparse Lithic Scatter, La Mesa USGS Topographic Quadrangle

MANAGEMENT SUMMARY

As a result of an archaeological survey of the Castlerock project area, five prehistoric archaeological sites were identified; four of these had been previously recorded. Four of the sites are within the area of the project proposed for development. Excavation of shovel test pits (as defined in the Sparse Lithic Scatter protocols of the Office of Historic Preservation) and collection of surface artifacts resulted in the conclusion that the sites are not significant under CEQA or the Historical Resources Guidelines of the City of San Diego. No further work is recommended at these sites, and no mitigation measures are necessary. The fourth site, SDI-10054, is within an open space area, the City's MHPA; excavation of test units to provide an index sample of this site may be necessary as a mitigation measure if impacts to sensitive biological resources can be avoided.

1. INTRODUCTION

On October 2, 2003, an archaeological survey of the Castlerock project area was conducted by Susan M. Hector, Ph.D. and Catherine A. Wright of ASM Affiliates, Inc. The Castlerock project area is located west of Sycamore Canyon in the eastern part of the City of San Diego, and includes low, cobble-covered ridges and steeper hillsides and slopes (Figures 1 and 2). The area surveyed is shown in Figure 2. Portions of the property will be in open space, with no development proposed. The total acreage of the project and the area surveyed is 183.8 acres. Of this, 102.8 acres will be disturbed for project development; the remainder will be in open space.

As a result of the survey, five archaeological sites were identified within the Castlerock project area. One of these, SDI-10,054, will be within the open space area, in the City's MHPA. The other four are within the area proposed for development, and were evaluated for significance under CEQA and the Historical Resources Guidelines of the City of San Diego (as amended on April 30, 2001).

The Castlerock VTM covers a total of 183.8 acres. Development would include 359 single family homes on individual and common lots, and 120-multi-family units, manufactured slopes, and internal streets. A north-south pedestrian trail will provide a connection to a regional trail system. Approximately 102.8 acres of the site would be disturbed by grading. The remainder would be conveyed to the City of San Diego as permanent open space.

The project is in the East Elliott area of the City of San Diego, east of Miramar Air Station (MCAS Miramar). The East Elliott area was previously part of Camp Elliott, a Marine Corps training facility active during the 1940s through the 1960s. The area was used for training and as an artillery range. Many of the archaeological sites recorded on MCAS Miramar are similar to those identified on the Castlerock property; the sites consist of cobbles of quartzite or quartz that were broken to form flakes and cores. Natural breakage of cobbles also occurs in the East Elliott area through weathering or heavy equipment use. Careful lithic artifact analysis is needed to distinguish between natural and cultural modifications to these materials. A major objective of this study was to establish a clear difference between naturally broken cobbles and artifacts.

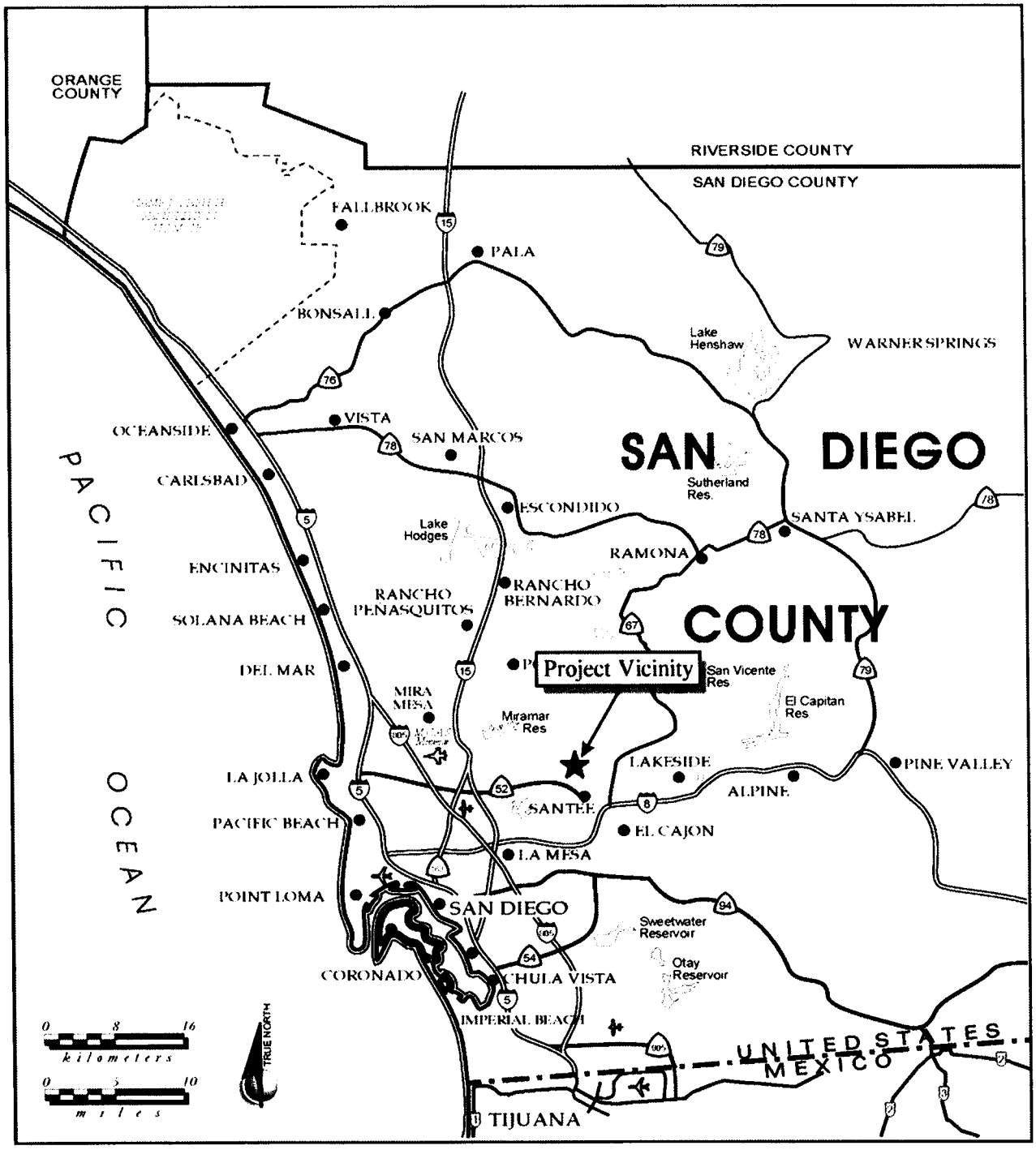

Figure 1. Project vicinity map.

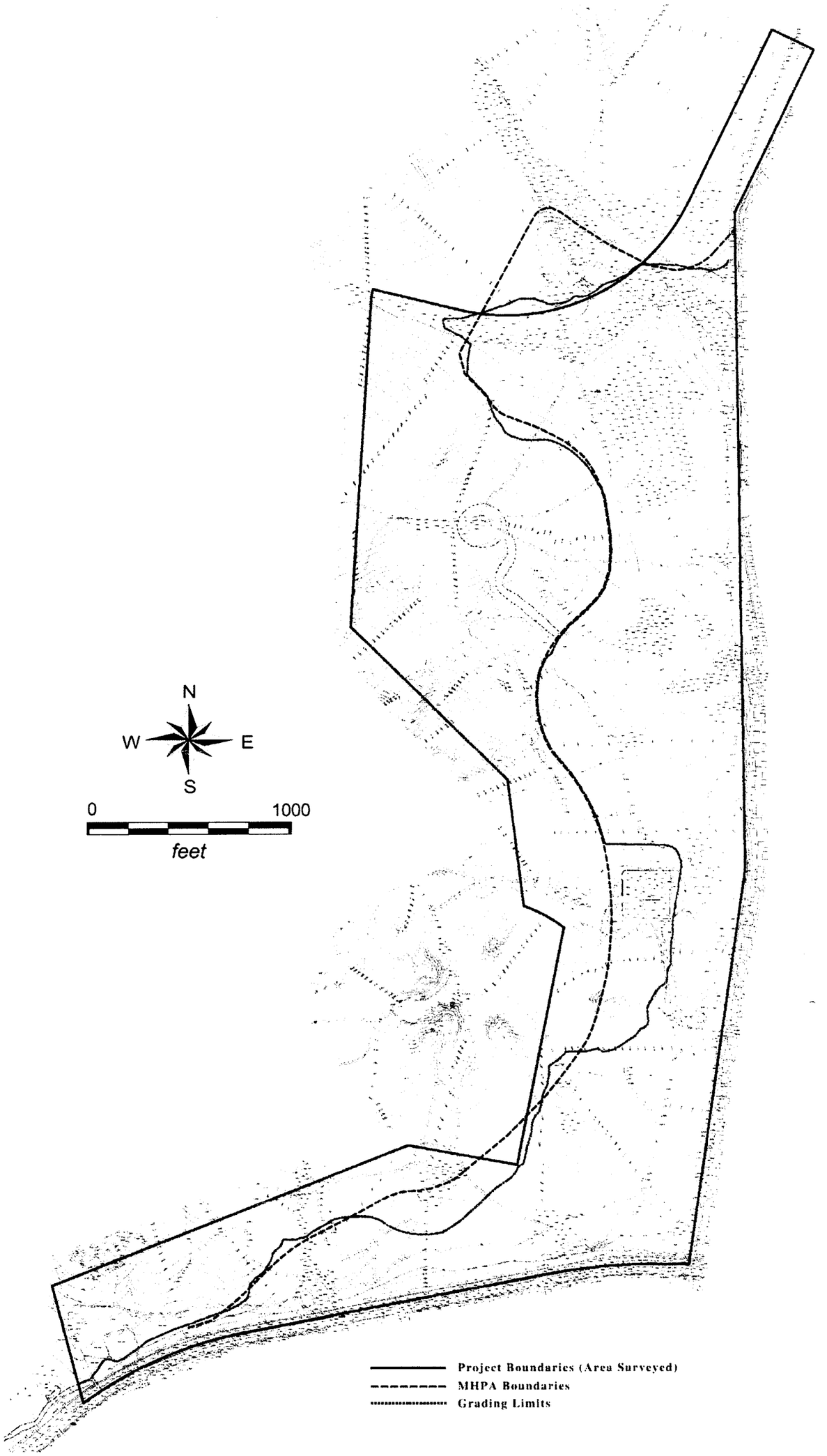

Figure 2. Project location map.

2. BACKGROUND RESEARCH

NATURAL SETTING

The project area is situated east of Fortuna Mountain, in a region of steep ridges and foothills. There are two major canyons in this area: West Sycamore and Sycamore. These canyons empty into the San Diego River, located south of the project area. Elevations in the project area range from 400-700 ft. above sea level. The topographic relief in the project area is severe due to the steepness of these eastern ridges and slopes. The ridges and slopes consist of deposits of the Poway Group of conglomerates, primarily Stadium Conglomerate (Kennedy and Peterson 1975). Stadium Conglomerate consists of nonmarine cobbles and yellowish coarse-grained sandstone. Fossils may occur within this formation. The canyon bottoms are filled with recently deposited (Quaternary) alluvium. None of the geological formations within the project area provided high-quality stone material for prehistoric Native American tool production.

The soils present within the project area are mainly Redding-Olivenhain association (USDA 1973). These are well-drained cobble and gravel loams over a hardpan. The steeper elevations grade from a loam to a clay soil that may be full of cobbles. The presence of hardpan and cobble alluvium under these thin soils made farming in this area problematic.

The area receives an average of ten inches of rainfall per year (Close 1970). Most of the rainfall comes during the winter months, indicating a Mediterranean dry summer climate. Summer days are hot, with highs well over 95 degrees Fahrenheit in July and August. However, frost is not uncommon in the eastern region during the winter months.

Vegetation communities within the project area include chamise chaparral, a native plant community featuring a dense association of chamise. This shrub with small leaves is notable for its appearance as a thick, dark green blanket over the hills of eastern San Diego County.

Some of the nearby canyons contain riparian woodland vegetation, including sycamore, willow, and live oak trees. Although all of the plant communities mentioned above provided sustenance and materials for prehistoric Native Americans, the riparian woodland community was especially rich in food resources.

Overall, the environment of the project area was not conducive to high density, long-term prehistoric settlement. Water and plant resources were limited or restricted to the broader seasonal drainage west of the project area; this drainage area has been developed into a residential community. Stone material for tool production was poor in quality. Steep, cobbled slopes and high, dry ridge tops created a forbidding landscape for occupation compared with the nearby San Diego River valley.

The existing land use of the property is as vacant land. Residences are adjacent to the eastern boundary of the property, and there is a small SDG&E facility (8 acres) adjacent to the west side of the property.

CULTURAL BACKGROUND

Paleo-Indian Period

The earliest generally-accepted archaeological culture in the San Diego region is the San Dieguito Complex. This complex is often assigned to the Paleo-Indian Stage, dating to at least 9,000 years ago, and was initially defined in an area centering on the San Dieguito River Valley, north of San Diego (Rogers 1929). It would appear to be contemporary with, or slightly later than, the more broadly known Fluted Point Tradition of the high plains, and the Western Pluvial Lakes Tradition of the western desert's ancient dry lakes.

Characteristics of the San Dieguito Complex include a variety of scrapers, choppers, bifaces, large projectile points, and crescentics; a scarcity or absence of milling implements; and a preference for fine-grained metavolcanic rock over metaquartzite. These groups had a nomadic lifestyle, with an emphasis on hunting (Davis et al. 1969; Moriarty 1969; Rogers 1929, 1966; Warren 1966, 1967).

Major research questions related to the Paleo-Indian period in the southern California region include:

- Confirmation of the presence of the Fluted Point Tradition in San Diego County (Davis and Shutler 1969);
- Better chronological definition of the San Dieguito Complex;
- Determination of whether the San Dieguito assemblages do in fact reflect an early occupation rather than the remains from a specialized activity set belonging to an Archaic-period culture;
- Clarification of the relationship of the San Dieguito Complex to later cultures;
- Determination of the subsistence and settlement systems which were associated with the San Dieguito Complex; and
- Clarification of the relationship of the San Dieguito Complex to similar sites in other parts of the country.

No San Dieguito Complex sites have been explicitly identified in or near the project area. However, there are many sites in the East Elliott and Miramar region that consist of non-diagnostic scatters of flaked stone and fractured cobbles. These sites may represent Paleo-Indian use of the area.

Archaic Period

Between about 8,500 to 7,500 years ago until approximately 1,500 years ago, an Archaic culture lived throughout much of southern California. Whether this culture replaced the San Dieguito culture or evolved out of it is unknown. Archaic period archaeological sites have been

variously labeled Milling Stone Horizon, La Jolla Complex, Encinitas Tradition, Campbell Tradition and Pauma Complex within San Diego County (Cardenas 1986; Davis 1976; Harding 1951; Ike et al. 1979; Kaldenberg 1982; Moriarty et al. 1959; Rogers 1929, 1945; Shumway et al. 1961; True 1958, 1980; Wallace 1955; Warren 1964, 1968).

The Archaic Period lasted over 6,000 years. Although various chronological and cultural subdivisions within the period have been proposed, none have received satisfacatory confirmation or general acceptance. The hallmarks of the La Jolla culture, a well-known coastal manifestation of the Archaic Period, are extensive exploitation of littoral resources, stone-on-stone milling, relatively crude cobble-based flaked stone tool technology, and inhumations. Inland Archaic sites feature extensive stone-on-stone milling, Elko-series projectile points, shallow midden deposits, and site locations on low hills or knolls.

Important research topics focused on this period include:

- Whether the cultural complex is a distinct culture or part of a continuum from Paleo-Indian cultures;
- Determination of whether coastal La Jolla sites represent permanent occupation areas or seasonal camps;
- The relationship between coastal and inland Archaic sites;
- The scope and character of Archaic-period long-range exchange systems;
- The role of natural changes or culturally-induced stresses in altering subsistence strategies over the long Archaic period; and
- The termination of the Archaic period as a cultural transformation, an ethnic replacement, or an occupational abandonment in western San Diego county.

Without the presence of diagnostic artifacts, sites from this period are difficult to identify with certainty. Caltrans (Corum and Crotteau 1985) excavated a series of small sites in the Shepherd Canyon/Fortuna Mountain area, and determined that the activities represented in the sites included milling, resource extraction, and stone tool production. However, no diagnostic artifacts were found. These sites may date to the Archaic period, but one of the sites contained two Late Prehistoric projectile points.

Site CA-SDI-12,254, located in Sycamore Canyon, was a sparse scatter of flaked stone artifacts; this type of site is difficult to date to a particular time period (Gross et al. 1992). The site may have been an Archaic tool production location, associated with a base camp elsewhere.

Two Archaic Period sites were excavated along the San Diego River in Mission Gorge near the corporate boundary between the cities of San Diego and Santee. Site CA-SDI-10,148 consisted of an intensive milling and plant food processing location (Kyle 1995). Six hearths, ground stone artifacts, and living floors, as well as flaked stone tools, were found at the site. Radiocarbon dates placed the site within the later part of the Archaic Period. Site CA-SDI-9,243, located in the same area as CA-SDI-10,148, had an Archaic occupation and a Late Prehistoric component in the upper levels of the site (Cooley 1995).

Archaic sites were also identified in Mission Trails Regional Park, west of the project area (Hanna 1978). All of these were stone tool production sites. A series of similar sites was tested at the west end of Miramar (Smith 1994). Although none of these sites contained diagnostic artifacts or datable materials, they represent use of the area over a long period of time to obtain and process stone for tool manufacturing.

Late Prehistoric Period

About 1,500 years ago, cultural evidence of the Kumeyaay-Diegueño people began to enter the archaeological record of southern San Diego County (Moriarty 1966; Warren 1968). This culture group lived in the county at the time of European contact, and still live in the region. The relationship between this cultural complex and the Archaic cultures is unclear. Other terms used for the Late Prehistoric culture include the Yuman Complex, Cuyamaca Complex, Hakataya Tradition, and the Patayan Tradition (May 1978; Rogers 1945; Schroeder 1979; True 1970; Waters 1982). Traits that have been used to identify Late Prehistoric sites include ceramics, small Cottonwood Triangular and Desert Side-notched projectile points, obsidian from the Obsidian Butte source in Imperial County, human cremation, and use of the mortar and pestle.

Explanatory models applied to Late Prehistoric sites have drawn heavily on the ethnographic record. Important research topics for Late Prehistoric sites include:

- Refining the chronology for the beginning of the culture;
- Examining the affects of environmental changes which were occurring in the eastern deserts;
- Clarifying patterns of inter- and intra-regional exchange;
- Examining the pre-contact horticultural practices of the culture; and
- Evaluating settlement patterns using ethnographic information.

Late Prehistoric sites can exhibit complex patterns of artifacts and features. Hector (1984) focused on the Late Prehistoric period to examine the use of special activity areas within large sites typical of this phase. At issue was whether activities such as tool making, pottery manufacturing, and dining were conducted in specific areas within the site, or whether each family unit re-created these activity areas throughout the site. Her findings indicated that no specialized areas existed within Late Prehistoric sites, and that tools made during this period served a variety of functions.

Late Prehistoric sites appear to be less common than Archaic sites in the coastal plains subregion of western San Diego County (Christenson 1990:134-134; Robbins-Wade and Gross 1990). These sites tend to be located on low alluvial terraces or at the mouths of coastal lagoons and drainages. Of particular interest is the observation that sites located in the mountains of eastern San Diego County appear to be nearly exclusively associated with the Late Prehistoric Period. This suggests that resource exploitation practices may have broadened and expanded during the Late Prehistoric, due to population pressure or advances in technology.

Late Prehistoric sites near the project area have been found along the San Diego River. Several late period sites were excavated in Santee by Caltrans (Corum 1986). Site CA-SDI-5,053 contained small, triangular projectile points, ceramics, and obsidian. Obsidian hydration dating indicated a period of occupation from A.D. 760 to A.D. 1600. An occupied rock shelter was also excavated at this site. Site CA-SDI-8,594, is also located along the San Diego River in Santee, and features several bedrock milling areas, as well as ceramics. A portion of CA-SDI-9,242 was also tested, although most of this site has been destroyed by construction of Mission Gorge Road.

Several of the sites recorded within Mission Trails Regional Park date to the Late Prehistoric Period (Hanna 1978). These sites are located along Mission Gorge and in the drainage running next to Mesa Road. The Mesa Road site complex is of interest because late period sites in side canyons are unusual. However, this particular drainage is spring-fed, and a tourmaline source is located adjacent to the site. These unusual resources probably led to the occupation of this marginal area.

It is unlikely that any of the drainages within the project area ever contained enough water to support a large, Late Prehistoric village site. The reach of Quail Canyon within the project area provided only intermittent water as a seasonal creek. Use of the area during the Late Prehistoric Period was limited to hunting and other resource extraction activities.

PREVIOUS RESEARCH

ASM conducted a record search of the Castlerock project area at the South Coastal Information Center in San Diego County on September 26, 2003 (Confidential Appendix A). The search encompassed a one-mile radius of the project area and identified thirty-eight cultural resources within that radius. All of the resources identified by the records search are prehistoric sites, the majority of which are temporary habitation sites and lithic scatters. A prehistoric site is defined as an archaeological site that dates to the period before European settlement of the area (prior to 1769, the founding of the San Diego Mission). Of these resources, four previously recorded sites are located within or adjacent to the project area. Sites within the project area include:

CA-SDI-4353

This site was recorded as a bedrock milling feature located approximately 4,000 ft. from the northern end along the eastern edge of the project area. M.J. Hatley of RECON recorded this site in 1975 as a Late Prehistoric milling station. It is located along the western edge of Sycamore Canyon. The feature includes four milling slicks on a 10 x 10 m granite boulder outcrop. No National Register status is provided on the site record.

CA-SDI-4354

This site was recorded as a lithic scatter by M.J. Hatley (Hatley and Kaldenberg 1976) and updated by Gallegos and Associates in 1996. The site contains three cores and eight pieces of

quartzite and metavolcanic debitage. The site is located along the western edge of Sycamore Canyon, approximately 3500 ft. south of the northern end and along the eastern side of the current project area. Gallegos and Associates described the site as, "...an open air lithic artifact scatter representing quarrying activity in the form cobble core tradition." (Schroth et al. 1996).

CA-SDI-10,054

This was recorded as an extensive lithic scatter located north of Mast Blvd. between State Route 52 and Medina Drive. The site was originally recorded by Hedges in 1978 as comprising 4 loci containing rock art, debitage, milling stations, and stone tools. Gallegos and Associates updated the site record in 1996. No rock art could be relocated during the update. No National Register status was provided on the site record.

CA-SDI-14,288

This site was recorded as a bedrock milling feature with associated ground stone artifacts located approximately 1,500 ft. south of the northern end and 75 ft. west of the eastern edge of the project area. The site was originally recorded by Gary Fink in 1975 as SDM-W-634, generally located at the mouth of Quail Canyon, and consisting of a milling station with grinding basins. In 1996, a bedrock outcrop located in the vicinity was recorded as SDI-14,288 by Gallegos and Associates (Schroth, Perry, and Tift 1996). The site was identified as two slicks and two ground stone artifacts. Associated midden and other artifacts originally noted by Fink could not be verified by Gallegos and Associates due to poor ground visibility. Table 1 summarizes the results of the record search.

Thirty-nine cultural resource surveys have taken place within or near the project area. Of these, five have crossed the current project area. These include: Carrico 1977 (positive); Cupples and Tolles 1974 (positive); Hector 1988 (positive); and City of San Diego 1990 (positive). Most of the surveys conducted within one mile of the project are located east and south of the Castlerock project area.

The record search included a historic map search. In addition, the 1928 aerial photographs on file at the County of San Diego were consulted to identify any potential sites associated with the historic period (post-1769). No structures or features were identified within the project area.

Table 1. Summary of Record Search Results

Site Number	Site Type	Approximate Location	Date Recorded/ Updated	Recorder's Name	National Register Status
SDI-203	Temporary habitation with historic artifacts	1 mile southwest of southern end of project area	1993	Affinis	
SDI-204	Habitation with rock shelters	3500 ft. south	n.d.	Rogers, updated by Treganza	
SDI-205	Lithic scatter (?)	5000 ft. south	1992	Gallegos	
SDI-4353	Bedrock milling	Within project area	1975	Recon	
SDI-4354	Lithic scatter	Within project area	1996	Gallegos	
SDI-4355	Rock shelter with quartzite tools and flakes	5000 ft. north in West Sycamore Canyon	1995	Ogden	
SDI-5050	Temporary habitation	4500 ft. southeast	1979	Pettus	
SDI-5689	Bedrock milling	5000 ft. southwest	1978	Hanna	
SDI-5981	2 artifacts	3500 ft. northeast	n.d.	Carrico	
SDI-5982	Lithic scatter	2000 ft. east of northern end	n.d.	Carrico	
SDI-5984	Lithic scatter	5000 ft. east	n.d.	Carrico	
SDI-5985	Lithic scatter	4250 ft. east	n.d.	Carrico	
SDI-8594A	Habitation site	4750 ft. south of southern edge	1992	Gallegos	6Y (determined ineligible)
SDI-9242	Lithic scatter	4000 ft. south of southern edge	1982	Noah	6y (determined ineligible)
SDI-9243	Temporary habitation	4500 ft. south of southern edge	1992	Cooley and Mitchell	2S2 (eligible)
SDI-10052	Bedrock milling	200 ft. south of southern edge	1974	Cupples	
SDI-10053	Lithic scatter	750 ft. south of southern edge	1974	Cupples	
SDI-10054	Artifact scatter	Falls within current project area at southwestern end in open space	1996	Gallegos	
SDI-10148	Temporary habitation	4500 ft. south of southeastern edge	1986	Corum	6Y (determined ineligible)
SDI-11057	Temporary habitation with bedrock milling	4000 ft. southwest of southwestern edge	1993	Gallegos	
SDI-11459	Artifact scatter	5000 ft. southwest of southwestern edge	1989	Mooney and Associates	
SDI-11606	Temporary habitation with bedrock milling	4500 ft. southwest of southwestern edge	1993	Gallegos	
SDI-11607	Temporary habitation	5000 ft. southwest of southwestern edge	1990	ERC Environmental	
SDI-13342	Lithic scatter	4250 ft. north of northern end	1993	Ogden	
SDI-13592	Lithic scatter	500 ft. west of southwestern end	1994	Smith	
SDI-13593	Lithic scatter	500 ft. west of southwestern end	1994	Smith	
SDI-13813	Temporary habitation	4250 ft. north of northern end	1994	Ogden	
SDI-14288	Bedrock milling	Falls within current project area	1996	Gallegos	
SDI-I140	Isolate	3500 ft. east of eastern edge	1984	RBR Associates	
SDI-I207	Isolate	3000 ft. southwest of southwestern end	1988	Corum	

Site Number	Site Type	Approximate Location	Date Recorded/ Updated	Recorder's Name	National Register Status
SDI-I210	Isolate	100 ft. south of southern end	1989	Affinis	
SDI-I211	Isolate	Falls within project area	1989	Affinis	
SDI-I262	Isolate	3750 ft. north of northern end	1990	ERC Environmental	
SDI-I713	Isolate	5750 ft. north of northern end	1993	Ogden	
P-37-016207	Isolate	2500 ft. west of northwestern edge	1997	Gallegos	
P-37-16208	Isolate	3500 ft. west of northwestern edge	1997	Gallegos	
P-37-16209	Isolate	200 ft. west of western edge	1997	Gallegos	
P-37-16210	Isolate	3800 ft. west of western edge	1997	Gallegos	
P-37-16213	Isolate	5000 ft. west of western edge	1997	Gallegos	

3. RESEARCH METHODS

Five archaeological sites have been recorded within the project area: SDI-4353, SDI-4354, SDI-10,054, SDI-14,288, and SDI-16,904. Four of the sites were previously recorded, and one was identified during the ASM survey of the property in October, 2003 as shown on Figure 3. A complete archaeological survey was conducted within the Castlerock project area in October 2003. Ground visibility was excellent due to the recent fires; in areas that had not burned, low vegetation covered the land, providing good visibility. Previously recorded sites, as indicated in the records search, were inspected. Site forms and updates were completed, and are included in Confidential Appendix B.

HISTORIC RESOURCES IN THE PROPOSED OPEN SPACE AREAS (MHPA)

SDI-10,054

This site, also recorded at the San Diego Museum of Man as SDM-W-1759, was recorded by Ken Hedges in 1978 and updated by Gallegos and Associates in 1996. The site was recorded as an artifact scatter of over 200 flakes, cores, manos, and cores. Three milling features were noted on the site form. On his 1978 site form, Hedges noted that badly faded rock art is located on the site. There is no map showing the exact location of the rock art, and it could not be found during the 2003 ASM survey. Hiking and bicycle trails run across the site area, and have caused disturbance and erosion. A concentration of midden and artifacts approximately 2,000 square meters in size was noted along Mast Boulevard during the 2003 ASM survey, in an area containing Coastal Sage Scrub vegetation. Isolated artifacts were observed in other areas of the site, but no other artifact or midden concentrations were noted. The site is located outside the development area and will be in open space. The City of San Diego's Historical Resources Guidelines require indexing of the subsurface component of a site that will be preserved in open space. For a site less than 6,000 square meters in size, two 1-x-1 m test units would be required. This information is then used to prepare a preservation plan, as required by CEQA. This report recommends that two test units be excavated at the site as part of the completion of mitigation requirements for the project, if this can be accomplished without causing impacts to sensitive biological resources. By delaying the index excavation, any impacts to the Multi-Habitat Planning Area (MHPA) can be avoided pending full identification of biological mitigation measures and management plans.

HISTORIC RESOURCES IN THE PROPOSED DEVELOPMENT AREA

The other four recorded sites are located within the area proposed for development. These sites were evaluated for significance under CEQA and the City of San Diego guidelines. Subsurface investigations were conducted at three of the sites; no cultural materials were found in the

recorded location of the fourth site, as explained in the paragraphs below. The City of San Diego's Historical Resources Guidelines require the excavation of test units to determine site significance. However, after discussion with the City of San Diego concerning testing at sites like those found within the Castlerock area, it was agreed that shovel test units are appropriate to use for lithic scatters and milling features, following the State of California's protocols for sparse lithic scatters. This approach also avoided impacts to vegetation in the site areas that could have occurred though the excavation of test units. Shovel test pits were located in areas of the sites where cultural materials were identified. The test pits were excavated to a depth of 40 cm. This depth was adequate to determine the absence of any midden or cultural deposits since no artifacts or cultural materials were found (typically, two sterile levels are excavated beyond the point where cultural materials are found unless there is a reason to suspect a buried deposit). The field work was conducted under the supervision of R.A. (Skip) Paradine, Jr., of InfoPro. Mr. Paradine conducted unexploded ordnance (UXO) sweeps of the site areas prior to any subsurface investigations. No ordnance was found in or near the areas tested. The work effort to evaluate the significance of the sites described below.

SDI-4353

This prehistoric site was recorded in 1975 by M.J. Hatley as a milling site. The site consists of four milling surfaces on a granite boulder. The site was recorded as part of a survey conducted for the Carlton Hills Substation (Hatley and Kaldenberg 1976). It was recorded as four slicks located on one 2 x 2 m boulder within a cluster of boulders. Although no artifacts were mentioned in the report, a surface collection was recommended. ASM conducted an excavation of four shovel test pits (STPs) around the base of the boulder to make sure that there is no cultural deposit present, and to collect any artifacts found at the site.

SDI-4354

Also recorded in 1975 by Jay Hatley, this site is a scatter of lithic artifacts on the ground surface. Hatley's site information was updated by Gallegos and Associates in 1996, who also observed artifacts on the surface. ASM recommended that the surface artifacts be mapped and recorded, then collected. Four STPs were excavated at the site to determine if a cultural deposit was associated with the lithic artifact scatter.

SDI-14,288

This site was originally recorded as SDM-W-634 by Gary Fink in 1975 as a milling station containing two basins and scattered midden deposits, including a metate fragment (Schroth et al. 1996:4-34). Gallegos and Associates revisited the site area in 1996, and recorded site SDI-14,288 as a bedrock milling feature with two slicks, and two mano fragments. The report (Schroth et al. 1996) stated that heavy vegetation cover prevented a complete inspection of the area; no midden was observed. The ASM survey attempted to relocate this site. The bedrock outcrop was identified, as clearly shown in a sketch provided in the Schroth et al. (1996) report; the poison oak bush present in 1996 is still there. However, no slick surfaces were evident on the outcrop; smooth patches were present, but these did not appear to be extensive enough to warrant assignment as slicks. No basins, as identified by Fink, were found. Ground

visibility during the ASM survey, in contrast to 1996, was excellent due to the October 2003 fire. The entire area around the bedrock outrcrops is open, and very little vegetation exists. No midden areas or artifacts were observed. The entire outcrop is on a slope of 45 degrees, over an intermittent drainage. Soils surrounding the bedrock are light tan with quartzite cobbles, some of which have been broken by erosion and weathering. Despite extensive searching of the recorded area and bedrock outcrops, no cultural materials or possible artifacts were observed. Therefore, no STPs were recommended for excavation at the site area; the steepness of the slope, the absence of artifacts, absence of midden soil, and the absence of milling features indicated that there was no reason to conduct further investigations.

SDI-16,904

This site was recorded by ASM archaeologists Hector and Wright during the October, 2003, survey. It was recorded as a surface scatter of lithic artifacts along the same low hill slope as SDI-4354, and it is in the same geological setting. ASM completed a DPR 523 site record form for this cultural resource (Confidential Appendix B). Although the quantity and quality of cultural materials noted during the survey were both low, ASM recommended that the surface artifacts be mapped and collected, and that four STPs be excavated at the site. This recommendation was made because of the similarity of the site area to that of SDI-4354.

All cultural materials recovered from test excavations and surface collections were analyzed to determine significance under City of San Diego and CEQA guidelines. The complete analysis included lithic tool analysis, lithic flake/debitage analysis, and other studies as appropriate. The objectives of the analysis for significance were to identify site function (for example, a resource processing location, a temporary camp site, a seasonal camp, or a village site), the age of the site, its cultural affiliation, and its place within the regional settlement system.

4. RESULTS

SUMMARY OF THE RESULTS OF TEST EXCAVATIONS

Testing for site significance consisted of the excavation of STPs measuring 30 x 30 cm., surface artifact mapping, and surface artifact collection as recommended and noted above. This size was selected for the shovel test pits because of the limited surface evidence for archaeological materials. If there had been any evidence for cultural deposits or artifacts on the surface, an increased size for the STPs would have been justified. In addition, the archaeologists were attempting to minimize impacts to vegetation within the project area by disturbing as little of the ground surface as possible. Figures 3 and 4 (see Confidential Appendix C) show the locations of sites tested on the property, the STPs, and surface collected materials. Site significance testing was accomplished on March 3, 2004, by Dr. Susan Hector, Drew Pallette, and Catherine Wright. Skip Paradine conducted UXO surveillance during the field work. No vegetation was disturbed or destroyed during the excavations at the sites. The STPs were located in open areas only and their size was reduced to minimize impacts.

SDI-4353

This site was recorded as four milling surfaces on a bedrock outcrop. Four STPs were excavated around the base of the outcrop, to a depth of 40 cm. No artifacts were found near the outrcrop, and no cultural materials were recovered from the STPs. A search of the area was conducted, and no artifacts were collected.

SDI-4354

Recorded as a scatter of lithic artifacts, the site is located in an area that has been disturbed by construction of a fire break. The four STPs excavated were located beyond the limits of the fire break. The STPs were excavated to a depth of 40 cm. No cultural materials were recovered from the STPs. A surface collection of materials described on the site form and update was conducted.

SDI-16,904

Possible mano fragments and flakes were identified at this site area during the ASM survey of October 2003. Because of the similarity of these materials to those found at other sites recorded in and near the project area, this area was recorded as a site, pending further analysis. Materials were collected from the surface of the site for further analysis in the laboratory. These materials were similar to those described at site SDI-4354. Four STPs were excavated in the site area to a depth of 40 cm. No cultural materials were identified in the STPs.

ANALYSIS OF FLAKED STONE ARTIFACTS FROM SDI-4354 AND SDI-16,904 *By Mark S. Becker, Ph.D.)*

Artifacts at sites recorded in the East Elliott area are challenging to analyze because the rock naturally weathers and breaks in patterns that mimic artifacts. Many are made of quartzite or other coarse material, and do not exhibit the classic attributes of flaked stone tools. A number of sites have been recorded in the East Elliott area that contain only broken cobbles and isolated cobbles identified as ground stone artifacts. Given this issue, a detailed analysis of the materials collected at the project area sites was conducted.

This discussion of the flaked stone analysis is divided into three basic artifact categories: cores, tools, and debitage. Cores are defined as nuclei or masses of stone (see Cotterell and Kamminga 1987) used to produce stone tools. Cores generally show the negative impressions from multiple flake removals and have edges that are often unsuitable for tool use other than as battering and abrading stones.

Tools are pieces of flaked stone that show intentional modification of an edge (retouched tools) intended for use through contact with another material, or unmodified artifacts that show evidence of having been used for some task (utilized flakes). Hence, artifacts defined as tools were not necessarily used for some task. In some cases, it is possible that an artifact may serve as a core in one part of its use-life, and then may become a tool in a later part of its use-life. A large biface, for example, may act as a highly portable source of flakes during the early part of its use-life, but with greater refinement, it becomes a projectile point (Kelly 1988; Yohe 1998, 2003). However, this widely used idea may not be accurate, as most bifaces produced flakes not necessarily suitable for tool use; that is, most bifacial thinning flakes have edges that are too thin to be useful tools, and most bifaces are not large enough to produce highly useful flake tools (Bamforth and Becker 2000; Becker 2003b).

Debitage are unworked chipped stone artifacts derived from cores or the production of tools, and include flakes, blades, and debris. Flakes are essentially artifacts that exhibit a dorsal side, a ventral side, a platform, and a bulb of percussion from the impact of removal from a core or biface. The dorsal side is generally marked by scars from previous flake removals and sometimes the presence of cortex. The ventral side is the smooth side from the interior of the core and often exhibits percussion rings on the surface. The platform is a remnant of the original surface struck by a hammer or punch, while the bulb of percussion is a feature associated with the force of impact, adjacent to the platform. Another type of flake known as a blade is frequently present in very low numbers within most North American assemblages. Blades are simply a distinctive type of flake. The minimum definition for a blade is that is at least twice as long as it is wide. However, the presence of a few blades does not necessarily indicate a different technology unless they are identified as "classic" blades, distinguished by medial ridges that run the length of the artifact and removed from specially prepared cores. The non-hafted portion of a projectile point is also often referred to as a blade but this is in reference to a specific part of a projectile point rather than a technology or artifact type. Finally, there is debris, which can be either flake-like or core-like. Shatter comprises artifacts

that exhibit some flake-like traits, such as conchoidal rings and a thin cross-section, but are missing evidence for a dorsal vs. ventral side, or platform/bulb. Chunks are core-like, but do not exhibit any of the signs associated with core reduction. They are generally produced from fractured poor-quality material that breaks into angular fragments during reduction, or the application of too much force to a cobble.

RECORDING PROCEDURES FOR FLAKED STONE ARTIFACTS COLLECTED FROM THE PROJECT AREA

A single recording procedure was consistently applied to all material classes, that being material identification. Material identification refers to the type of stone that was used for the production of chipped stone artifacts. Material was identified by visual means, the range of types including quartzite and unidentified volcanic/metavolcanic.

Cores

Four potential classes of core types were searched for in this analysis. Unidirectional cores, also known as single platform cores, have a single platform from which all of the flakes derived from the core were struck. As these cores near exhaustion, they typically become conical in cross-section. Bidirectional cores have two opposed platforms and can include bifacial cores. Multiplatform cores have three or more unpatterned platforms where the relationship between the platforms is difficult to describe. Tested cobbles are cores that exhibit the removal of only 1 or 2 primary flakes, probably for the purpose of assessing the quality of the raw material for tool production.

Tools

Tools are classified into four basic categories: bifaces, projectile points, retouched flake tools, and utilized flakes. Bifaces are chipped stone artifacts worked on two sides, exhibiting invasive flake scars around the entire or almost the entire margin with the intention of producing a functional edge. Additional bifacial tools can include drills/perforators and non-patterned bifaces. Drills/perforators are relatively long and narrow bifaces with a diamond-shaped or near circular cross-section. As for non-patterned bifaces, a simple explanation for their occurrence may be related to early stage production.

Finally, one of the most important subsets of bifaces is the projectile point, generally a diagnostic biface, with hafting attributes and a point at the opposing end. Many projectile point types possess a high degree of stylistic variability associated with seriation patterns culturally indicative of time and space. These different diagnostic features often include variables such as size, shape, flaking patterns, and technology. Projectile point types for this area can include Elko types, Cottonwood Triangular, and Desert Side-notched.

Retouched flake tools show intentional retouch to one or more edges, and this includes forms that are traditionally known as scrapers, notches, denticulates, gravers/perforators, and non-patterned flake tools. Scrapers are unifacially retouched flakes, generally with steep invasive

retouch forming a smooth continuous functional edge. Notches are generally unifacially retouched flakes recognized by a distinctly formed concavity along the tool edge. A denticulated tool consists of three or more contiguous notches, where the retouch can be either unifacial of bifacial. Gravers/perforators are flake tools where notches and other retouching produces a distinctive spur. Non-patterned flake tools often show uneven edges and non-contiguous retouch that can be unifacial, (non-invasive) bifacial, or combinations. Finally, unlike flake tools, utilized flakes have edges that were altered through use. Based on established usewear studies (see Keeley 1980; Vaughn 1985; Bamforth 1988), edge wear types were classified as either scalar, step, denticulated, battered, or abraded edges.

Use of the utilized flake category was limited to macroscopic edge wear, and a more rigorous study would require a high magnification microscope to examine edge wear damage. All edge wear was identified with a magnifying glass on only unretouched flake edges. While studies have demonstrated the difficulties in the identification of utilized flakes and the need for a rigorous methodology (e.g., Young and Bamforth 1990), the author possesses an extensive collection of experimentally-used lithic artifacts for comparison. We also recognize a problem with identifying expedient tools, as most flaked stone tool technology is relatively expedient. For example, compared to the time involved in producing the hafts for points, which could take days or weeks, most small bifaces take only 15–30 minutes to produce (Becker 1999; Keeley 1982). Functionally, large points could easily work as multipurpose tools (e.g., knives, projectiles, scrapers), and for prehistoric people, especially if on the move, this could take the place of a diverse tool kit. With the addition of cores, prehistoric people would also have access to knives (i.e., flakes) with extremely sharp edges. The adopted view for this study is that bifaces and cores often form complementary sets of tools for general prehistoric tasks, rather then divergent technologies (also see Bamforth and Becker 2000), and the data from this project are used to examine the viability of this idea.

Bifaces

In addition to typology, weight, and material, four other attributes were recorded for each biface: blank type, completeness, size, and production stage. Blank type identifies whether a biface was made on a flake, a cobble/tablet, or made from an unknown or indeterminate blank. Completeness records the following variables: complete, length missing, width missing, length/width missing, indeterminate. Size was measured with three variables: length, width, and thickness. For incomplete bifaces, this was obviously more complicated, and for biface fragments that could not be oriented, the longest dimension was designated as the axis. Production stage refers to the process of manufacturing and refining bifaces, especially those that are eventually intended to become projectile points, where the biface is commonly thought to progress through a series of stages. These stages reflect a continuum ranging from initial shaping to discard. Classifications can range from nine to five stages (Andrefsky 1998; Callahan 1974, 1979; Whittaker 1994) probably reflecting the variability of production factors including the type of point being manufactured, the shape of the raw material, the size of the artifact, and flake vs. cobble/tablet origins. For this study, we searched for four categories of production stages: early, late, ambiguous, or indeterminate.

Retouched Flake Tools

In addition to typology, weight, and material, six additional attributes were recorded for each flake tool: blank type, completeness, size, orientation of retouch, type of modification, and flake type. Blank type identifies whether a flake tool was made on a primary, secondary, or interior flake, or made from an unknown or indeterminate blank. Completeness records the same variables taken for bifaces: complete, length missing, width missing, length/width missing, indeterminate. Size was measured with three variables: length, width, and thickness. Orientation of retouch defines whether the retouch was observed on the distal/proximal ends, lateral edges, or on multiple edges. Type of modification defines how the edge was modified, such as obverse, inverse, inverse-obverse, alternating, and bifacial retouch. Obverse retouch refers to unifacial retouch on the dorsal side of a flake, while inverse retouch is located on the ventral side. Inverse-obverse retouch refers to opposite lateral edges that are flaked on different faces. Bifacial retouch implies a worked edge on two opposing faces, but with non-invasive retouch. Alternating retouch indicates that a single edge was retouched on both faces, but unlike a traditional biface, this retouch is not directly located on opposite sides. Last of all, flakes were typed as being struck from a core, a biface, or as indeterminate. A more detailed discussion on core-biface flakes can be found below in the debitage section.

Utilized Flakes

Utilized flakes were recorded in a manner almost identical to retouched flake tools, particularly for completeness, size, weight, material, and flake type. However, for obvious reasons, there was no need to record orientation of retouch or type of modification. Instead, we identified usewear types as being either scalar, step, denticulated, or abraded edges. Our edge damage conforms to Keeley's (1980:24) descriptions, where the modification is generally no larger than 5 mm. The term "denticulated edge damage" was used instead of "½ moon edge damage" referred to by Keeley (1980). Keeley (1980) also divided edge damage into different size ranges: large, 10-2 mm in width; small, 2-.5 mm in width; and micro, less than .5 mm in width. Finally, the term "abraded" was added to the analysis, meaning the edge was artificially rounded or dulled, probably from abrasion with a stone. Determining utilization damage was based on a rigorous methodology as indicated by Young and Bamforth's (1990) study, using experimentally produced and used artifacts, and existing literature (e.g., Keeley 1980:24) as a guide to examine prehistoric stone tools.

Debitage

Debitage (i.e., flakes and blades, and debris—shatter and chunks) are typically the most common artifact class at prehistoric archaeological sites, and for this reason, one of the most important elements for interpretation and comparison. Our study of the debitage focused on the manufacturing techniques used in the production of flakes, and how those flakes fit into the manufacturing sequence from initial acquisition and shaping to discard at each site or loci.

The main goal during lithic debitage analysis is to examine technology, especially bifacial vs. core technology. Another goal is to examine the relative stages of core-biface production. However, like any analysis, all carry some degree of problems.

DEBITAGE ANALYSIS AND METHODOLOGICAL PROBLEMS

One of the more interesting problems in debitage analysis concerns the ability to infer core vs. biface manufacturing techniques, especially for mixed assemblages (see Andrefsky 1998). This analysis recognizes that most flake artifacts are actually ambiguous to define, since lithic assemblages generally consist of small and/or broken flakes. However, we believe the smaller sample of larger complete artifacts constitutes an important data component of prehistoric technology, and will demonstrate that here. While there has been some important discussion on what are and how to define bifacial thinning flakes, this task is often complicated by other factors such as raw material type and size, and ambiguity in some analytic procedures (also see Andrefsky 1998; Sullivan and Rozen 1985). However, as Andrefsky (1998:118) notes, much of the ambiguity, at least for analytic procedures, can be avoided by adequately defining the various technological types.

Frison (1968:149-50) provided an early definition for bifacial thinning flakes, which are basically flakes with faceted platforms. While basically true, Bamforth (1984) points out additional complexity, where as reduction proceeds from a hypothetical, cortex-covered core to a refined biface, the nature of the platforms on the debitage also changes, becoming more and more complex. In this sense, high percentages of single vs. multiple platforms can help differentiate between core and biface technology. However, either technology, especially biface technology, can produce relatively small amounts of either platform type. Therefore, while the nature of the platforms can act as an indicator of reduction stage for bifaces, this must be cautiously evaluated whenever core technology is present. Another definition for bifacial thinning flakes is that these are artifacts with most or all of the following characteristics: curved longitudinal cross-sections, extremely acute lateral and distal edge angles, feathered flake terminations, narrow faceted striking platforms, a lip, little or no cortex, and a small flattened or diffuse bulb of force (Root 1992:83 in Andrefsky 1998:118). We also note that bifacial thinning flakes reveal additional characteristics such jagged edges, non-symmetrical shapes, and that the dorsal scarring frequently shows opposed and/or opposed 90 flaking patterns. Hence, the identification of bifacial thinning flakes is a complex amalgamation of many traits, but few flakes actually show all of these traits.

Debitage Analysis: Definitions

Debitage types include bifacial thinning, core, bipolar, and indeterminate flakes. All are based on visual identifications and are defined below.

Bifacial thinning flakes, as the name implies, are those pieces of debitage produced during the manufacture of bifacial tools when one is attempting to reduce the artifact's thickness using direct percussion with either a hard or soft hammer (Root 1993, Whittaker 1994). Replication experiments have shown that flakes produced during thinning tend to share a number of characteristics: a relatively large number of dorsal flake scars and these flake scars often reveal a different direction of applied force from the one used to remove the flake under consideration (Andrefsky 1998; Root 1993; Whittaker 1994); usually only a small amount of cortex, if any, on the dorsal surface; multifaceted platforms that may show signs of having been removed

from a bifacially-worked edge; a lip may occasionally be present at the junction of the ventral surface and the platform (Cotterell and Kamminga 1987); curved longitudinal cross-sections (Andrefsky 1986); extremely acute lateral and distal edge angles, feathered flake terminations, narrow faceted striking platforms, small flattened or diffuse bulb of force (Andrefsky 1998); jagged edges, and non-symmetrical shapes.

Core flakes are artifacts struck from a core and, in general, show common characteristics. Core flakes are relatively thick, often show relatively little curvature in cross-section, and tend to mostly have single platforms. While not all core flakes will be useful, practical core flakes should tend to have sharp edges; that is, sturdy, non-brittle edges that are moderately straight, or at least not jagged.

Bipolar flakes are created through the use of a hammer-and-anvil technique, resulting in flakes that frequently have crushing at both the proximal and distal ends. Although they do not have opposing bulbs of force on each end of the flake, they do tend to have pronounced compression rings. When viewed end on, they often resemble an orange wedge (Crabtree 1982; Cotterell and Kamminga 1987; Root 1993).

Any piece of debitage that did not belong to one of these classes, and quite often had a mixture of traits observed for core and bifacial thinning flakes, was placed in the indeterminate class.

The final category of analysis was natural edge damage, that is, edge damage produced through trampling, post-depositional, or some other type of disturbance. Natural damage is similar to utilization damage or even retouch, but show mixtures of size and edge damage types such as edge crushing, scalar, step, or denticulated edge damage, along with a random distribution pattern (Becker 2003a; Keeley 1980; Odell and Odell-Vereecken1980; Vaughn 1985).

A DESCRIPTION OF THE MATERIALS COLLECTED FROM THE PROJECT AREA

SDI-4354

All recovered materials from SDI-4354 were classified as pseudo-artifacts (Table 2). These pseudo artifacts included core-like, retouched flake-like, and debitage-like materials. While all of the materials were made from quartzite, none had characteristics associated with true cores, tools, or debitage. The core-like materials all resemble multidirectional cores, but do not have negative flake scars and prepared platforms associated with true cores. Instead, they show randomly distributed and faceted faces, and some of the fresher breaks may be the result of plow damage. These pieces range in size from 48.1-79.6 mm. The pseudo-debitage consists of one piece that looks similar to an interior flake and one that is primary flake-like. Neither piece has strong flake characteristics such as a bulb or percussion, a platform, or percussion rings. Finally, the pseudo-retouched flake does have some characteristics of a real flake, such as a platform and a large bulb of percussion, but its ventral side exhibits characteristics normally

associated with a dorsal side, namely a flake scar not related to the platform. This piece measures 96.8 mm in length. Furthermore, the invasive denticulated edge damage is generally weakly defined, that is shallow with some stepping, and does not conform to patterns observed from intentionally produced edge modification. This piece shows additional natural denticulated edge damage on very steep non-functional edges too, while the most intensive edge damage was found on a less acute edge.

Table 2. All Recovered Material from SDI-4354

		Total	
Class	**Subclass**	***n***	**%**
Pseudo-Core	Multidirectional	4	57.1
Pseudo-Debitage	Interior	1	14.3
	Primary	1	14.3
Subtotal		2	28.6
Pseudo-Retouched Flake	Denticulate	1	14.3
Total		**7**	**100.0**

Note: all artifacts made from quartzite.

This collection gives the overall impression that this is not a true cultural site. First, none of the artifacts show actual characteristics associated with true cores, debitage, and retouched pieces. Second, all the material are made of quartzite, where there is usually a mixture of materials found at these sites. Last, there is a very high ratio of cores compared to debitage. If this was a true site, there should have been a higher ratio of debitage compared to cores.

SDI-16,904

As at the previous site, all the materials recovered from SDI-16,904 were classified as pseudo-artifacts (Table 3). The pseudo-artifacts included debitage-like and groundstone-like materials. The pseudo-debitage all look similar to primary flakes. Two are made from quartzite and four from metavolcanic/volcanic materials. As observed at SDI-4354, none from this site have typical flake characteristics such as a bulb or percussion, a platform, or percussion rings. Instead, they appear to be natural spalls or cobbles broken by plowing. They are flake-like only because they are relatively thin slivers of rock. As for the possible groundstone, none have traces of battering, grounding, or any other type of human modification. They range in size from 93.4-132.5 mm in length, and are all made from granitic materials. In general, there is no artifactual evidence that this is a true archaeological site.

Table 3. All Recovered Material from SDI-16,904

Class	**Subclass**	**Granite**		**Metavolcanic**		**Quartzite**		**Total**	
Pseudo-Debitage	Primary	0	0.00%	4	100.00%	2	100.00%	6	66.70%
Pseudo-Ground Stone	Mano	3	100.00%	0	0.00%	0	0.00%	3	33.30%
Total		**3**	**100.00%**	**4**	**100.00%**	**2**	**100.00%**	**9**	**100.00%**

IMPACT ANALYSIS AND MITIGATION RECOMMENDATIONS

Following extensive analysis and evaluation, none of the materials collected from SDI-4354 and SDI-16,904 were determined to be cultural. No artifacts were found at SDI-4353, and the milling features have been mapped and recorded on the site form. No artifacts or cultural materials were found at SDI-14,288. Updated site record forms have been completed for these sites reflecting the results of this project (see Attachment 2). The four sites located within the area proposed for development do not meet the City of San Diego Guidelines for significance under CEQA.

Site SDI-10,054 will be within an open space area, the City's MHPA. Under the City's Guidelines, an index sample of the site and a treatment plan will be needed. It is recommended that these measures be delayed until completion of the environmental review process to avoid adverse impacts to the MHPA. Once the biological inventories and evaluations are complete, the archaeological indexing program can be designed to avoid any adverse impacts to sensitive biological resources.

REFERENCES

Andrefsky, Jr., W.

1998 *Lithics: macroscopic approaches to analysis*. Cambridge University Press, Cambridge.

1986 A consideration of blade and flake curvature. *Lithic Technology* 15:49-54.

Bamforth, D.B., and M.S. Becker

2000 Core/Biface ratios, mobility, refitting, and artifact use-lives: a Paleoindian example. *Plains Anthropologist*. 45:273-290.

Bamforth, D. B.

1984 Analysis of chipped stone artifacts. In Archaeological investigations on the San Antonio Terrace, Vandenberg Air Force Base, California, in connection with M-X facilities construction. Chambers, Consultants and Planners. Submitted to U.S. Army Corps of Engineers, Los Angeles District.

1988 Investigating microwear polishes with blind tests: the Institute results in context. *Journal of Archaeological Science* 15:11-23.

Becker, M. S.

1999 *Reconstructing Prehistoric Hunter-Gatherer Mobility Patterns and the Implications for the Shift to Sedentism: a perspective from the Near East.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Colorado, Boulder.

2003a Spatial Patterning in the Upper Palaeolithic: A perspective from the Abu Noshra Sites. In *More than Meets the Eye: Studies on Upper Palaeolithic Diversity in the Near East*, edited by Nigel Gorring-Morris and Anna Belfer-Cohen. Oxbow Press, Oxford.

2003b Analysis of the Lithic Assemblage from Olancha/Cartago. In *Lacustrine Lifestyles Along Owens Lake: NRHP Evaluation of 15 Prehistoric Sites for the Olancha/Cartago Four-Lane Project, U.S. 395, Inyo County, California*. Edited by Brian Byrd and Micah Hale. Prepared for Caltrans.

Callahan, E.

1974 *Experimental Archaeology Papers, No. 3*. Department of Sociology and Anthropology, Virginia Commonwealth University, Richmond.

1979 *The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts*. Archaeology of Eastern North America 7, Eastern States Archaeological Federation, Washington, Connecticut.

Carrico, Richard L.

1977 *Archaeological Survey of the Carlton Hills Community Phase I.* Westec Services, Inc.

Cardenas, D. Sean
1986 Avocado Highlands: An Inland Late La Jolla and Preceramic Yuman Phase Site from Southern San Diego County. *San Diego State University Cultural Resource Management Center Casual Papers* 2(2): 59-84

Christenson, Lynne E.
1990 The Late Prehistoric Yuman People of San Diego County, California: Their Settlement and Subsistence Pattern. Unpublished Doctoral Dissertation, Department of Anthropology, Arizona State University.

City of San Diego
1990 *Clean Water Program for Greater San Diego Santee Basin Water Reclamation Project Draft Environmental Report*. San Diego Water Utilities Department.

Close, Daniel H.
1970 Agricultural Production. In *Climates of San Diego County: Agricultural Relationships*, edited by Daniel H. Close, Dewayne E. Gilbert, and George D. Peterson. University of California Agricultural Extension Service.

Cooley, Theodore G.
1995 Early Period Results from Data Recovery Conducted on a Portion of Stratified Prehistoric Site SDI-9243, San Diego County, California. *Proceedings of the Society for California Archaeology* 8. San Diego, California.

Corum, Joyce
1986 Extended Phase I and Phase II Archaeological Test Excavations at Sites SDI-205, 5053, 8594, 9242, and 10,148, Santee, California. California Department of Transportation, San Diego.

Corum, Joyce and Karen Crotteau
1985 Archaeological Test Excavations at sites SDI-5655, 5658, 9239, 9240, 9246, 9247, and 9913, in Shepherd Canyon, San Diego, California. California Department of Transportation, San Diego.

Cotterell, B., and J. Kamminga
1987 The formation of stone flakes. *American Antiquity* 52:675-708.

Cupples, Sue Ann, and Ruth Tolles
1974 *Mast Boulevard Archaeological Survey and Mitigation Report*. San Diego State University.

Crabtree, D.E.
1982 *An Introduction to Flintworking*. Second Edition. Occasional Papers of the Idaho Museum of Natural History, No. 28.Idaho Museum of Natural History, Pocatello, Idaho.

Davis, Emma Lou
1976 Two Dated La Jolla Burials and Their Place in California Prehistory: A Review. *Pacific Coast Archaeological Society Quarterly* 12(4).

Davis, Emma Lou and Richard Shutler, Jr.
1969 Recent Discoveries of Fluted Points in California and Nevada. *Nevada State Museum Anthropological Papers* 14: 154-169. Carson City.

Davis, Emma Lou, Clark W. Brott, and David L. Weide
1969 The Western Lithic Co-Tradition. *San Diego Museum of Man Papers* 6. San Diego.

Frison, G.C.
1968 A functional analysis of certain chipped stone tools. *American Antiquity* 33:149-155.

Gross, Timothy, Ruth C. Alter, Mary Robbins-Wade, and John L.R. Whitehouse
1992 Archaeological Data Recovery Investigations of the Sycamore Canyon Substation Site (SDI-12254), San Diego, California. Affinis, San Diego.

Hanna, David C.
1978 A Cultural Resource Study of the Murray, Cowles, and Fortuna Mountain Regional Park. RECON, San Diego.

Harding, Mabel
1951 La Jollan Culture. *El Museo* 1(1).

Hatley, Melvin Jay and Russell L. Kaldenberg
1976 Archaeological Survey Report for the Carlton Hills Substation. RECON.

Hector, Susan M.
1984 Late Prehistoric Hunter-Gatherer Activities in Southern San Diego County, California. Unpublished Doctoral Dissertation, Department of Anthropology, University of California at Los Angeles.
1988 *A Cultural Resources Survey of the Proposed East Elliott Community Planning Area*. Recon.

Ike, Darcy, Jeffrey L. Bada, Patricia M. Masters, Gail Kennedy, and John C. Vogel
1979 Aspartic Acid Racimization and Radiocarbon Dating of an Early Milling Stone Horizon Burial in California. *American Antiquity* 44.

Kaldenberg, Russell L.
1982 Rancho Park North: A San Dieguito-La Jolla Shellfish Processing Site in Coastal Southern California. *Imperial Valley College Museum Society Occasional Paper* 6. El Centro, California.

Keeley, L.H.
1980 *Experimental Determination of Stone Tool Uses*. University of Chicago Press, Chicago.
1982 Hafting and retooling: effects on the archaeological record. *American Antiquity* 47:798-809.

Kelly, R.L.
1988 The three side of a biface. *American Antiquity* 53:717-734.

Kennedy, Michael P. and Gary L. Peterson
1975 Section B: Eastern San Diego Metropolitan Area. In: Geology of the San Diego Metropolitan Area, *California Bulletin* 200. California Division of Mines and Geology.

Kyle, Carolyn
1995 A 2,000 Year Old Milling Tool Kit from SDI-10148, San Diego, California. *Proceedings of the Society for California Archaeology* 8. San Diego.

Magne, M.P., and D. Pokotylo
1981 A pilot study in bifacial lithic reduction sequences. *Lithic Technology* 10:34-47.

May, Ronald V.
1978 A Southern California Indigenous Ceramic Typology: A Contribution to Malcolm J. Rogers' Research. *Journal of the Archaeological Survey Association of Southern California* 2(2).

Moriarty, James R.
1966 Cultural Phase Divisions Suggested by Typological Change Coordianted with Stratigraphically Controlled Radiocarbon Dating at San Diego. *Anthropological Journal of Canada* 4(4).
1969 The San Dieguito Complex: Suggested Environmental and Cultural Relationships. *Anthropological Journal of Canada* 7(3).

Moriarty, James R., George Shumway, and Claude N. Warren
1959 Scripps Estate Site I (SDI-525): A Preliminary Report on an Early Site on the San Diego Coast. *Archaeological Survey Annual Report 1958-1959*. University of California at Los Angeles.

Odell, G. and F. Odell-Vereecken
1980 Verifying the reliability of lithic use-wear assessments by "blind tests": the low power approach. *Journal of Field Archaeology* 7:87-120.

Robbins-Wade, Mary and Timothy Gross
1990 Historic Properties Archival and Field Survey for the Fiesta Island Replacement Program. Affinis, El Cajon.

Rogers, Malcolm J.
1929 The Stone Art of the San Dieguito Plateau. *American Anthropologist* 31.
1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1.
1966 *Ancient Hunters of the Far West*. Union-Tribune Publishing, San Diego.

Root, M.J.
1992 The Knife River Flint Quarries: The organization of stone tool production. Ph.D. dissertation, Washington State University. University Microfilms, Ann Arbor, Michigan.
1993 Archaeological field and laboratory techniques. In Site 32DU955A: Folsom occupation of the Knife River flint primary source area, ed. by M.J. Root, pp. 33-75. Center for Northwest Anthropology Project Report, No. 22. Pullman: Washington State University.

Schroeder, A.H.
1979 Prehistory: Hakataya. In Southwest, edited by Alfonso Ortiz. *Handbook of North American Indians* 9, William C. Sturtevant, general editor. Smithsonian Institution.

Schroth, A., J. Perry, and L. Tift
1996 Site Form Update for CA-SDI-4353. Gallegos and Associates.

Schroth, Adella, Dennis R. Gallegos, Peti McHenry and Nina Harris
1996 Historical/Archaeological Survey Report for the Water Repurification Pipeline and Advanced Water Treatment Facility, City of San Diego, California. Gallegos and Associates.

Shumway, George, Carl L. Hubbs, and James R. Moriarty
1961 Scripps Estate Site, San Diego, California: A La Jolla Site Dated 5460 to 7370 Years Before Present. *Annals of the New York Academy of Sciences* 93.

Smith, Brian F.
1994 Nobel Drive I-805 Interchange and Extension Project. Technical Appendices – Volume III. Cultural Resources Technical Report. Brian F. Smith and Associates, San Diego.

Sullivan, A.P., and K.C. Rozen
1985 Debitage analysis and archaeological interpretation. *American Antiquity* 50:755-779.

True, D.L.
1958 An Early Complex in San Diego County, California. *American Antiquity* 23.
1970 Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California. *Archaeological Survey Monographs* 1. University of California at Los Angeles.
1980 The Pauma Complex in Northern San Diego County: 1978. *Journal of New World Archaeology* 2(4).

USDA
1973 Soil Survey, San Diego Area, California.

Vaughan, P.
1985 *Use-Wear Analysis of Flaked Stone Tools*. University of Arizona, Tucson.

Wallace, William J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11.

Warren, Claude N.
1964 Cultural Change and Continuity on the San Diego Coast. Unpublished doctoral dissertation, Department of Anthropology, University of California at Los Angeles.
1966 The San Dieguito Type Site: Malcolm J. Rogers' excavation on the San Dieguito River. *San Diego Museum Papers* 5.
1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32.
1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In: Archaic Prehistory in the Western United States, edited by Cynthia Irwin-Williams. *Eastern New Mexico University Contributions in Anthropology* 1(3). Portales.

Waters, Michael R.
1982 The Lowland Patayan Ceramic Tradition. In: *Hohokam and Patayan: Prehistory of Southwestern Arizona*, edited by Randall H. McGuire and Michael B. Schiffer. Academic Press, New York.

Whittaker, J.C.
1994 *Flintknapping: making and understanding stone tools*. University of Texas Press, Austin.

Yohe, R.M.
1998 The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring. *Journal of California and Great Basin Anthropology* 20(1):26-52.
2003 A Technical Analysis of Lithic Debitage from Six Archaeology Sites from the Olancha/Cartago Four-Lane Project. In *Lacustrine Lifestyles Along Owens Lake: NRHP Evaluation of 15 Prehistoric Sites for the Olancha/Cartago Four-Lane Project, U.S. 395, Inyo County, California*. Edited by Brian Byrd and Micah Hale. Prepared for Caltrans.

Young, D., and D.B. Bamforth
1990 On the Macroscopic Identification of Used Flakes. *American Antiquity* 55(2):403-409.