DIGGING IN DESERT DUNE FIELDS: METHODOLOGICAL CONSIDERATIONS

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ABSTRACT

This paper describes recent work in the La Quinta area of the Coachella Valley in Riverside County. Research entailed investigation of two properties, 35 and 50 acres respectively, located in dune fields associated with the former shoreline of the ancient Lake Cahuilla. In contrast to typical archaeological assumptions, the studies indicated that areas with the densest surface cultural deposits generally had poor research potential. Areas of greatest research potential, often associated with mesquite dunes, had little, if any, surface indicators. Approaches for the discovery and treatment of significant buried deposits in such an environment are considered.

INTRODUCTION

This paper presents the results of recent research in the central area of the City of La Quinta, Riverside County, California. Specifically, the study areas considered lie within a region that falls on the north side of Avenue 48 between Adams Street and Jefferson Street. This area is one of the fastest developing regions in California. Unfortunately, the area also has one of the densest concentrations of precontact archaeological sites in the state. These factors, combined with the unique characteristics of sand dune environments, create great challenges for archaeologists working in the region.

This area lies within rolling, semi-stable sand dunes containing intermittent blowouts. Native vegetation of the study area comprises a Creosote Scrub community. Plants typical of this community are creosote (*Larrea tridentata*), mesquite (*Prosopis glandulosa*), burrobush (*Ambrosia dumosa*), and dicoria (*Dicoria canescens*). This landform comprises, and is typical of, the remnant shoreline of ancient Lake Cahuilla, a large lake that once occupied the basin to the south and east of the area under consideration. The Salton Sea, a much smaller body of water, now fills this basin. Ancient Lake Cahuilla (also called Lake La Conte or Blake's Sea), existed during periods of inundation of the area by the Colorado River. The river's usual course was to flow directly into the Gulf of California. Periodically, fluctuations in distributary channels would create an accumulation of sediments at the river's mouth. This would result in the formation of a deltaic barrier which restricted access to the gulf, causing the course of the river to shift. This diversion caused the Salton Trough, a geologic depression that extends northward 140 miles (225 km) from the gulf, to fill and form a fresh water lake. Eventually, the river's course would shift back to the gulf and desiccation of the lake would occur. This lake probably filled and desiccated at least five times within the last two millennia (for a summary see Brock, Smith, and Wake 1999:7). The final stand occurred in the 1600s.

Filling of the lake created excellent fishing opportunities and produced a rich marshland environment that could have been exploited along with the lake and desert resources. Many useful plants grow in this community and were used by the Cahuilla. The marshland would have also drawn in many birds, mammals, and reptiles. The Cahuilla, and possibly other groups, took advantage of these faunal resources.

The creation of sand dunes in this environment probably relates to past climate change and the fluctuation of Lake Cahuilla rather than to simple aridity (Clarke and Rendell 1998). The dunes tend to be vegetation anchored by creosote and to a lesser degree by mesquite thickets. Rejuvenating mesquite thickets can not only anchor dunes, they can result in an increase in the dunes' size over hundreds, if not thousands, of years. Of course, dune areas with little or no vegetation are more susceptible to movement through aeolian processes.

PROPOSITIONS

It is proposed here that, given the uniqueness of this ancient shoreline dune environment, standard archaeological techniques have the potential to produce skewed results that can ultimately end in the loss of significant sites. In particular it is suggested that:

- Concentrating field work on surface archaeological manifestations (e.g. placing units based on surface scatters) can be a misdirected effort because soil deflation in the aeolian sand environment can result in the destruction of stratigraphic integrity and create a shallow artifact deposit akin to a desert pavement.

- Surface sites will generally evaluate as non-significant for three primary reasons: (1) the lack of stratigraphy will result in a mixing of what may have once been temporally discrete materials; (2) relic seekers and aeolian processes will have removed diagnostic artifacts from the surface; and (3) they will be largely undateable because surface charcoal will have blown away or be contaminated.

- Buried sites will be present in the aeolian sand dune environment and they will have the greatest research potential. What goes up must come down. Sand accumulation will occur in the dune environment, particularly in regenerative vegetation contexts (e.g. mesquite dunes) or in areas of depressions, either natural or caused by the decay of brush or wooden structures. This will result in cultural deposits being sealed and buried through time. These deposits will have good integrity but, as Schiffer (1996:241) points out, "_ the result is often near total loss of visibility for the resultant sites."

SUPPORTING STUDIES

Three studies on the north side of the Avenue 48 corridor in La Quinta present data to support these propositions: the Burning Dune site, the Miraflores project, and the test of APN 649-036-030.

The Burning Dune Site (CA-RIV-4754)

The Burning Dune site (CA-RIV-4754) was located near the intersection of Avenue 48 and Adams Street. It was impacted by the widening of Adams Street in 1997. Data recovery took place at the site prior to the street project. A monograph has been prepared on the site (Brock, Smith, and Wake 1999) as well as a summary article (Smith and Brock 1999).

The Burning Dune site excavation was the first study conducted that pertained to the opening of the Avenue 48 corridor for development. The significance of CA-RIV-4754 for this paper is that it clearly illustrated the potential for buried sites to be present in the area. This site, which falls within a mesquite covered dune, was characterized by a massive layer of burnt mesquite, the top of which ranged in depth from 70 to 150 cm below the ground surface. Some 30 to 40 cm below this was a large, well-preserved deposit of fish remains, primarily comprising bonytail (*Gila elegans)* and razorback sucker (*Xyrauchen texanus*). The burnt mesquite layer, which dated to about AD 1800, was interpreted as representing Cahuilla mesquite thicket exploitation and maintenance through burning. The lower level dated to the early AD 1600s and was interpreted as a fishing camp, or fish processing area, associated with the final stand of Lake Cahuilla.

Given the considerable depth of the cultural deposits at the Burning Dune site, it is unlikely that the site would have been discovered during the

survey phase had it not been distinctly exposed in the escarpment of the road cut for the original construction of Adams Street between Highway 111 and Avenue 48. The site clearly demonstrates that the accumulation of aeolian sands on mesquite-covered dunes can seal and preserve archaeological deposits. Strangely, there were a few pottery sherds on the surface of the dune but these were underlain by 20th-century deposits (a concrete post anchor and a layer containing plastic shot shells) resting between the surface and the mesquite burn layer. Consequently, the surface sherds had to be intrusive. The factors accounting for their presence on the site are unclear but are possibly related to aeolian activity.

The Miraflores Project

Investigations for the Miraflores project, a residential housing development, were initiated by Archaeological Advisory Group as a Phase II test excavation of two previously identified precontact sites, CA-RIV-6059 and CA-RIV-6060 (Brock and Smith 1999a). Of relevance to this discussion are the findings from CA-RIV-6059. The main component of this site (Locus A), as recorded during the Phase I survey, was an alkali sink area containing "2000+" pottery sherds, hundreds of fragments of burnt unshaped clay, and minor quantities of other materials (Demcak 1997:19).

At first we approached the site in a traditional manner, conducting a surface collection and excavating test units. The excavation of four one-by-one meter units in central portions of dense Locus A surface scatter indicated that the deposit was completely deflated—no artifacts were recovered below 2 cm. The specimens recovered from the surface scatter were fragmentary and almost totally undiagnostic.

The northern area of this site (Locus B), which had only 20 surface specimens, had a single one-by-one meter unit excavated in it. This unit was dug to 30 cm and postholed to 100 cm. It produced one sherd and two clay fragments from the top 10 cm.

The findings from CA-RIV-6059 seemed to indicate the site had little research potential. However, given our recent experience at the Burning Dune site, we decided that some sort of deep testing needed to be conducted to ensure that major buried sites would not be impacted by the proposed project. We chose to use a backhoe to dig trenches to minimally 2 meters in depth at 50 meter intervals in a grid over all accessible areas of the 35.9-acre property. All backhoe soil was screened using one-quarter inch mesh on a sled-mounted screen apparatus.

Starting at the northeast corner of the property, the first trench of 39 dug encountered a major buried deposit in the Locus B area of CA-RIV-6059 not far from where we had excavated a test unit. Further trenching established the perimeter of the deposit and hand excavation established the nature of the deposit. The dense cultural deposit, which falls within a depression surrounded by mesquite dunes, ranges in depth from 50 to over 200 centimeters. The site is multi-component, is in an excellent state of preservation, and has a full spectrum of cultural materials. Radiocarbon dates indicate occupation ranging from approximately AD 1300 to 1700. Given the obvious research potential of the site, we negotiated with the developer (Catellus Residential Group), the City of La Quinta, and our Cahuilla consultant (Anthony Andreas) and mutually agreed to preserve the 0.6-acre site as an open space area (grass covered park).

Had it not been for the backhoe testing this deposit would not have been encountered until grading had commenced and the chances for its preservation would have been negligible. No other buried sites were encountered on the project during the backhoe testing and no sites were discovered during monitoring in the areas that had been tested by backhoe.

The Test of APN 649-036-030

Another property along the Avenue 48 corridor that is proposed for development is the 50-acre APN 649-036-030. This property had three precontact sites previously recorded on it

(Everson 1992), one of which was the previously discussed Burning Dune site (CA-RIV-4754). A test program needed to evaluate the other two sites (CA-RIV-4746 and CA-RIV-4753) and address the potential for as yet unidentified buried sites to be present.

As the first step of the test program a 50-meter interval grid was established over the entire property. Systematic backhoe trenching to a minimum depth of two meters was conducted over the entire 50-meter grid Brock and Smith 1999b). Again, the sandy soil was screened through one-quarter inch mesh. Seventy two trenches were excavated over the 50-meter grid with an additional 26 trenches dug to better define deposits or to further investigate suspicious areas (e.g. mesquite thickets).

No new sites were discovered by the backhoe trenching, but the extent of CA-RIV-4746 was significantly revised as a result to the testing. This site had been initially recorded based on its surface materials which generally appeared in blown out areas in the central southwestern part of the property. Thirty-three blow outs were recorded. These generally contained fragmentary thermally affected rock, fragmentary unmodified rock, bone fragments, and an occasional pottery sherd or baked clay fragment. The backhoe testing indicated that their was a subsurface component to the sites that extended some 40 meters to the south of the blow out areas. The backhoe trenching, along with hand excavation, further indicated that cultural material in the area of the blow outs had little or no depth, with the blow outs representing areas of deflated soil. This excavation further proved that CA-RIV-4746 had a buried component to the south of the previously recorded site area. This area had no surface artifacts or ecofacts. This component extended to a depth of at least 1.5 meters and contained evidence of light sporadic subsistence activities that took place over a period possibly extending from AD 880 to 1425, according to three radiocarbon dates.

The investigations at APN 649-036-039 showed, once again, that surface materials are not indicative of subsurface deposits and that subsurface deposits do not necessarily have surface indicators. Furthermore, because most of the test trenching was negative, grading of the property can be approached with greater confidence that buried sites will not make surprise appearances.

CONCLUSIONS

Surface dune deposits, while appearing to have potential, are often the result of soil deflation processes and may have little research value due to lack of stratigraphy and the absence of diagnostic artifacts and dateable material.

Given the nature of the aeolian dune environment, the potential for buried archaeological deposits is high. In contrast to surface deposits, buried sites have the greatest research potential because: their stratigraphic integrity is generally intact; carbon and other dateable material will be present; and, because the sites have not been picked over by relic seekers and impacted by aeolian action, a full range of the site's artifacts will be present.

Traditional hand excavation techniques, focusing on surface deposits, might produce skewed results. The only way to objectively locate potentially significant buried sites prior to grading monitoring is through systematic, deep test excavation.

We believe that, given the pace of site destruction by development today, the "prime directive" of archaeology should be the preservation of potentially significant sites. The key to site preservation is to identify sites as early in the planning process as possible, preferably before any development plan is laid out. The preservation of sites should be an element of the development plan. If site identification is left to the monitoring phase the potential for preserving discovered sites is virtually nil. A developer would much rather "throw money" at a last minute data recovery program than reformulate their set-in-stone development plans.

We have offered here a possible solution for identifying and preserving potentially significant

sites in the aeolian sand dune environment of the California desert.

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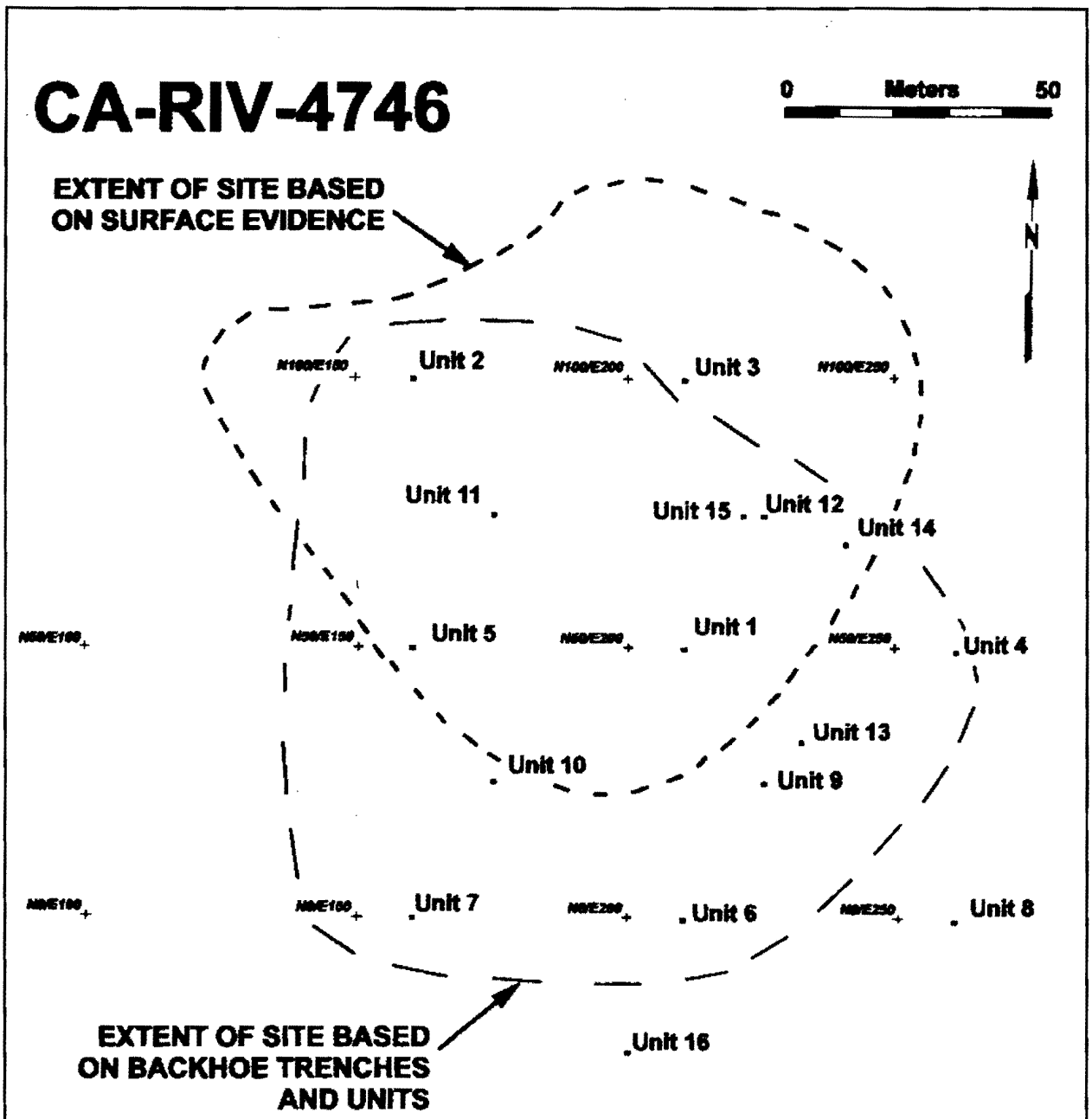

Figure 1. Contrast between surface and subsurface manifestations of CA-RIV-4746.