ARCHAEOLOGICAL SITE DATA FROM OCOTILLO WELLS STATE VEHICULAR RECREATION AREA

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Over the course of a four-year study (2008-2011), archaeologists from California State Parks examined and documented more than 453 sites and isolates within Ocotillo Wells State Vehicular Recreation Area. The results of this study provided a wide range of site, feature, and artifact data. Analyses of these data show both expected and unexpected patterns that may relate to cultural affiliation, temporal placement, and site uses.

Ocotillo Wells State Vehicular Recreation Area (Ocotillo Wells SVRA) is located in the Colorado Desert of southern California, east of San Diego and west of the Salton Sea. It is a unit of the Off-Highway Motor Vehicle Recreation Division (OHMVR) of California State Parks. The ancient high-water shoreline of Lake Cahuilla runs generally north/south through the property, and the San Felipe Hills run east/west (Figure 1). Ocotillo Wells SVRA was established in 1975 as a place where off-road vehicle enthusiasts could continue to enjoy off-road recreation, while other portions of the desert such as the adjacent Anza-Borrego Desert State Park were set aside for greater levels of protection and restricted or prohibited off-road use.

PROJECT BACKGROUND

In 1998, an archaeological survey of portions of Ocotillo Wells SVRA was undertaken by State Parks archaeologists (Hines et al. 1998, 2002). Approximately 14,860 acres were surveyed, and 99 previously undocumented sites and numerous isolates were identified. But nearly 10 years later, in 2007, when the Ocotillo Wells District Archaeologist conducted a record search at the Southeastern Information Center, none of the sites identified during the 1998 project appeared in any of the record search results. Upon investigating the reason, the Information Center coordinator explained that although some site record forms had been submitted from the 1998 work, they had been incomplete and were missing required information, so they had never been processed (Jennifer Parker, personal communication 2007).

To finalize the records, it was decided that the sites should be revisited and that updated site records should be prepared. Due to concerns about off-road vehicle impacts to the desert landscape based on the results of studies of off-road vehicle impacts and the damages that can be caused by overuse or abuse (e.g., Shore 2001; Webb and Wilshire 1983), it was decided that site condition assessment would be an important part of the documentation of the archaeological sites during the 2008-2011 study. It was expected that the most damaging effects of recreational "off-roading" would be concentrated within those portions of Ocotillo Wells SVRA where "open riding" is allowed, and would be less evident in those areas where the "stay on trails or roads" restrictions were in place.

In addition to site condition evaluation, several research questions were discussed prior to the start of the study, including temporal placement, site function, and cultural affiliation. In regards to cultural affiliation, it was noted that Ocotillo Wells SVRA is located along the traditional boundary between the Desert Cahuilla to the north and the Kamia (or eastern Kumeyaay) to the south. Although San Felipe Wash is often used as the delineator between the territories of these two cultural groups, it has been postulated that the San Felipe Hills, a low ridge that separates the northern and southern parts of Ocotillo Wells SVRA, may have also functioned as a territorial divide in this area.

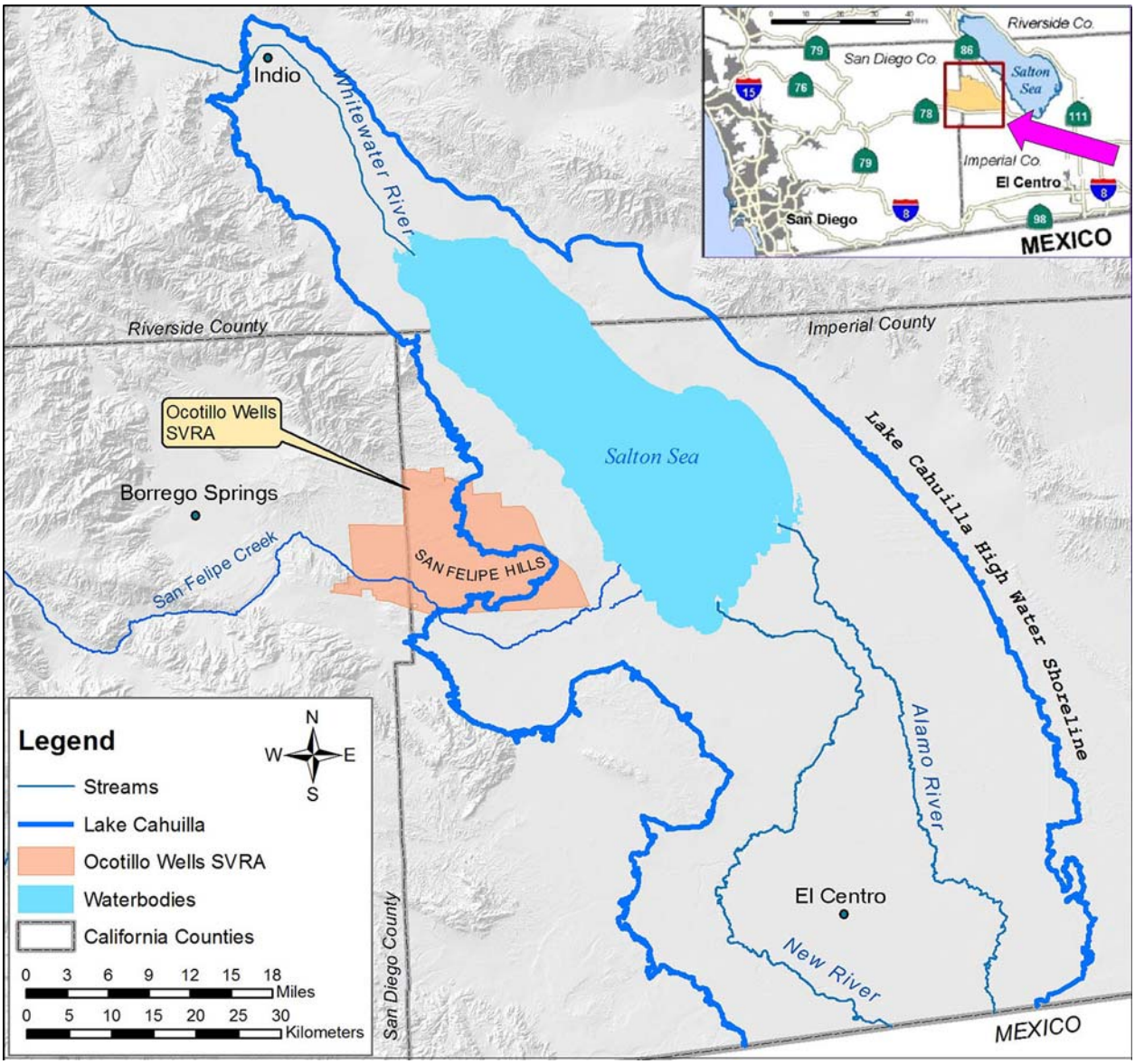

Figure 1. Location map showing high-water shoreline of Lake Cahuilla.

RESULTS

Over the course of the 2008-2011 study, archaeologists from State Parks' Southern Service Center spent a total of 11 weeks examining most of the sites from the 1998 project. The field crew surveyed and inspected 1,755 acres in the eastern half of Ocotillo Wells SVRA, resulting in the recordation of more than 450 newly and previously identified sites and isolates (Mealey 2012). This included updates for 76 of the 99 sites from the 1998 project.

The results of the site condition assessment were somewhat unexpected. Those sites within the "open riding" portions of the property that were examined during the 2008-2011 study were generally found to be in good to fair condition. In fact, overall conditions for the sites examined during the 2008-2011 study were good to fair throughout, with only 5 percent of the sites noted to be in poor condition.

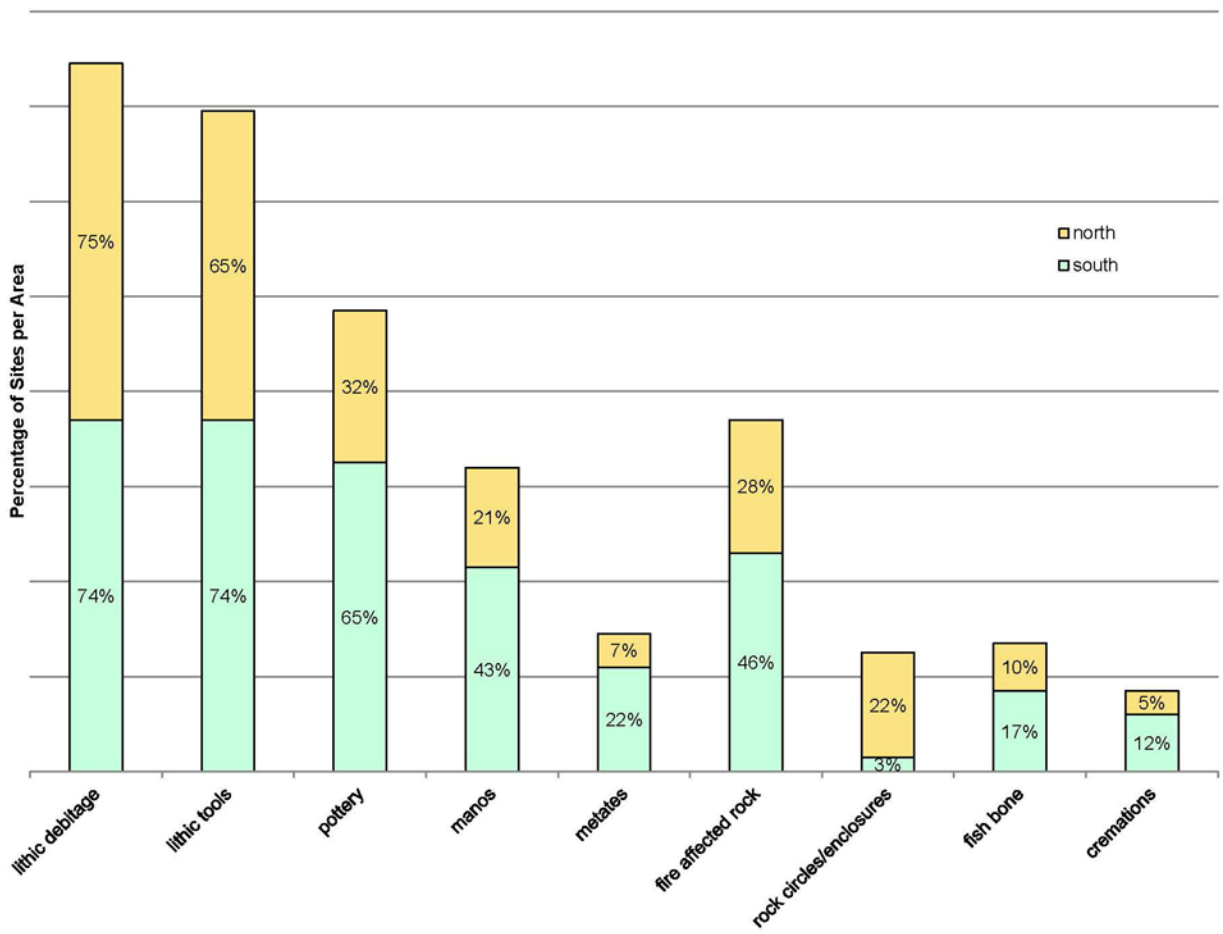

Figure 2. Common site constituents (percentage of sites per area).

These "poor condition" sites were mostly located in heavy-use areas along the side of the highway on the southern edge of the property.

CULTURAL AFFILIATION

In an attempt to answer the cultural affiliation question, the study examined 919 acres to the south of the San Felipe Hills and 836 acres to the north, documenting 219 sites and isolates in the south and 234 sites and isolates in the north. The resulting site data were examined to look for patterns or differences that might demonstrate cultural differences between these geographical areas. A wide variety of artifacts and features were identified and recorded during this project. The most common site constituents are shown in Figure 2, which identifies the percentage of sites within each area containing each constituent.

The most notable differences between the north and south that were observed during the examination of artifact and feature distribution were the larger percentages of sites containing pottery, manos, metates, fire-affected rock features, and cremations in the areas to the south, and the greater percentage of sites containing rock circles in the areas to the north.

Of the chipped and battered stone tools identified during the project, cores (n = 721) and core tools (n = 452) were by far the most common, followed by hammer stones (n = 314) and flake tools (n = 202). Most of the identifiable projectile points were Late-period Cottonwood triangular and Desert side-notched varieties, but one possible Pinto point and two leaf-shaped points were also recorded.

Lithic Material Types

When the distribution of flaked-stone material types and their percentages were examined, quartzite was found to dominate the lithic assemblage in both the northern and southern areas, followed by fine-grained volcanics and cherts. In fact, most stone material types were fairly consistent in their distribution among sites in the areas both north and south of the San Felipe Hills. However, there were two material types whose distribution may show evidence of a territorial divide: wonderstone, and obsidian.

The closest source for wonderstone is the Rainbow Rock quarry, located a short distance to the north of Ocotillo Wells SVRA within Cahuilla territory, while the closest obsidian source is Obsidian Butte in Kamia territory east of the Salton Sea. Other researchers have described the lack of evidence of cross-cultural trade between the Cahuilla and Kamia in this area, based on the relative absence of wonderstone from the Rainbow Rock quarry at sites in Kamia territory and the lack of obsidian from Obsidian Butte at sites in Cahuilla territory (see McCorkle-Apple et al. 1997:7-18 to 7-21).

The wonderstone identified during the 2008-2011 study was not examined closely for sourcing characteristics, so it is impossible to say whether it was from Rainbow Rock or from Cerro Colorado, another wonderstone quarry located within present-day Mexico. Other sites located in Kamia territory, such as the Elmore Site located south of San Felipe Creek, show evidence of wonderstone from Cerro Colorado (Laylander 1994). However, the number of wonderstone artifacts identified during the 2008-2011 study was twice as high in the areas to the north of the San Felipe Hills as compared to the areas to the south, which suggests that the inhabitants of the sites to the north had greater access to the Rainbow Rock quarry. But the presence of some wonderstone in the southern areas indicates that they too had access to the material, either through trade or because they were allowed access to one of the quarries due to a shared cultural territory. Sourcing analysis would help clarify from which quarry the wonderstone that was recorded during the 2008-2011 study was obtained.

Obsidian was sparse throughout, but was more common in the southern areas. Ten pieces of obsidian were documented overall, eight of which were recorded at six sites in the southern areas and two pieces at two sites in the northern areas. Comparison with the distribution of obsidian found at other sites in Kamia territory does seem to indicate some difference in amounts between sites in Cahuilla territory versus those in Kamia territory. For example, an examination of obsidian artifact distribution among sites in Anza-Borrego Desert State Park shows that of the 26 sites with obsidian artifacts indicated on the site record, only three are located north of San Felipe Creek.

Pottery

The 2008-2011 study also did not closely examine pottery fragments for sourcing purposes, due to the difficulty of distinguishing these types through visual inspection alone. Other researchers (e.g., Gallucci 2001; Hines et al. 2002:106; Plymale-Schneeberger 1993) have demonstrated the problems with trying to differentiate between types of pottery by visual inspection and have recommend use of microscopic analysis of thin sections or chemical analysis to successfully identify different pottery types. For the 2008-2011 study, pottery was broadly identified as either brownware or buffware, and no differentiation was made between mountain and desert wares. Overall, pottery was more common in the southern areas than in the northern ones (Figure 3). However, brownware sherds were almost twice as common as buffware in the northern areas, while buffware sherds were more common than brownware in the southern areas. These differences could be due to access to clay sources, trading patterns, or cultural affiliations.

Very few of the sherds recorded during the 2008-2011 study displayed modifications or decorations. Only 22 sherds of the over 4,900 pieces of pottery that were recorded showed pre-firing incising decorations. Of these, 15 were recorded in the area south of the San Felipe Hills and seven were recorded at sites in the north. Six sites, three in the north and three in the south, contained potsherds

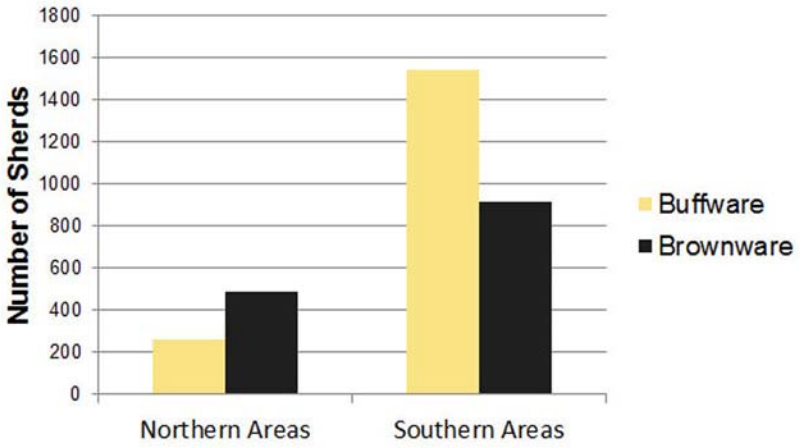

Figure 3. Pottery distribution.

with evidence of slip or paint. Of the 14 sherds with post-firing drill holes, 10 were located at sites in the south and four were located at sites to the north of the San Felipe Hills.

Ground Stone

Manos dominated the ground stone assemblage identified during the fieldwork. As noted before, a higher percentage of sites in the southern areas contained manos and metates compared to the areas north of the San Felipe Hills. Most of the manos were made of granitic materials, while most of the metates were made of tabular sandstone.

Only one possible bedrock grinding feature was identified during the study. It was located in the area north of the San Felipe Hills and was described as a small, shallow mortar. Although the weathering of the sandstone bedrock made it impossible to say for certain whether the small depression was made or used culturally, the fact that the site within which it is located contained other ground stone artifacts, coupled with the general shape and appearance of the depression, indicates a strong probability that it was used for grinding.

Two arrowshaft straighteners and a "sharpening stone" were documented at sites south of the San Felipe Hills during the study (Figure 4). The three artifacts are made out of different materials: the globular shaft straightener is a moderately hard, fine-grained material that looks like a mudstone, the drilled shaft straightener is a weathered soapstone, and the sharpening stone is made of tabular sandstone. All three have incised lines decorating them, although the weathering of the sandstone and soapstone make the lines difficult to discern without enhancement (Figure 5).

Faunal Remains

Faunal remains were sparse at the sites examined during the study. Although many sites contained small and thin freshwater clams and gastropods, there was no indication that these were used culturally or as a significant source of food. However, several sites did contain examples of thicker-shelled marine invertebrates, including fragments of scallops or cockles, and undifferentiated clam species most likely obtained from the Pacific Coast or the Gulf of California. Of the 12 sites documented to contain marine shell fragments, nine are located south of the San Felipe Hills, perhaps another indication of cultural affiliation and easier access for the Kamia through their western Kumeyaay kin to the coastline of California.

Human remains were identified at 17 sites during the 2008-2011 study: eight to the north of the San Felipe Hills, and nine to the south. Most of the nonhuman bone recorded during the study was from

Figure 4. Arrowshaft straighteners and sharpening stone.

Figure 5. Arrowshaft straighteners and sharpening stone with incised lines highlighted.

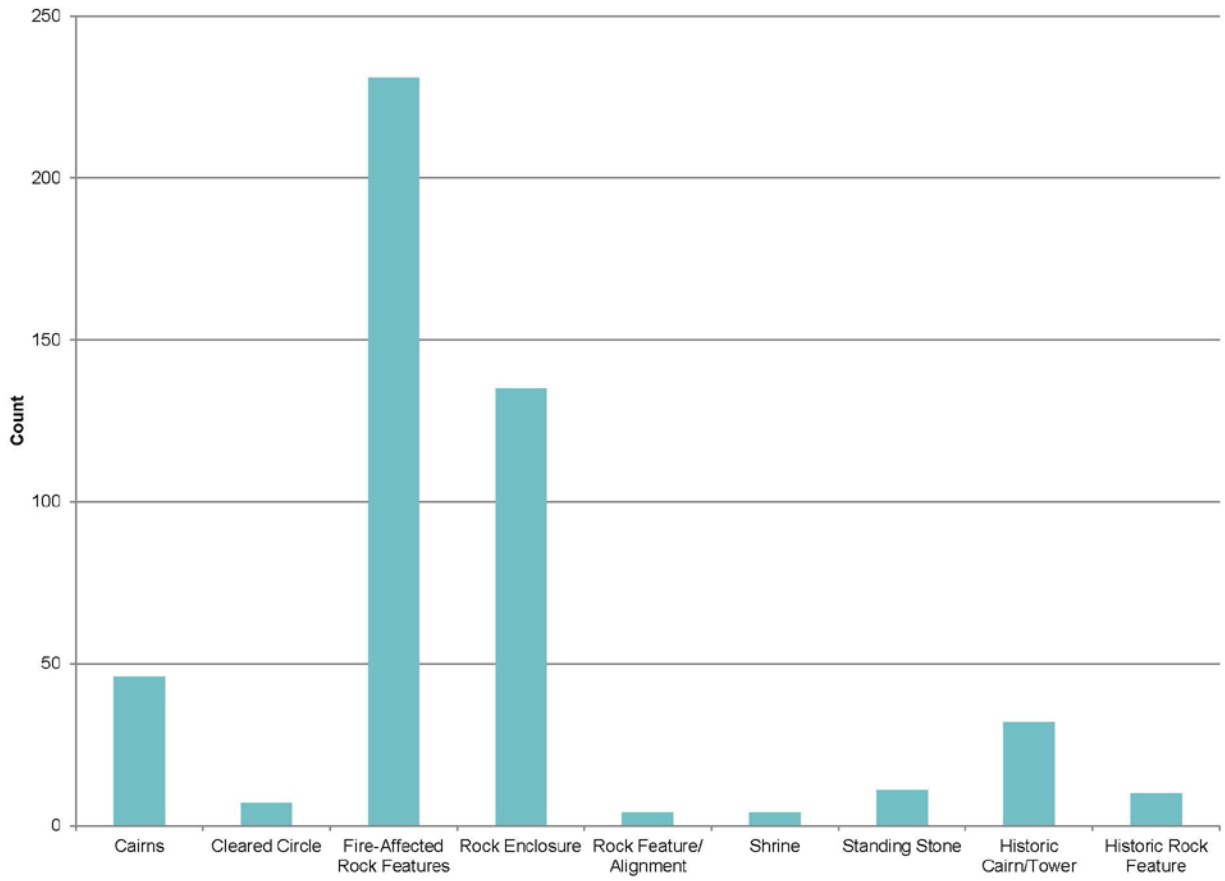

Figure 6. Number of features recorded.

two species of freshwater fish that once inhabited Lake Cahuilla: bonytail (*Gila elegans*) and razorback sucker (*Xyrauchen texanus*). A photo analysis of the fish bone documented during the 2008-2011 study, utilizing the document *Fish Remains from the Ocotillo Wells Land Acquisition Project: How to Distinguish Bonytail Remains from those of Razorback Sucker* (Gobalet 2000), determined that 61 percent of the fish bone was bonytail, only 11 percent was razorback sucker, and the remaining 28 percent was unidentifiable as to species. Nearly all of the identifiable fish bone was recorded at sites to the north of the San Felipe Hills. Small amounts of mammal bone and bird bone were also noted at several sites throughout the study area, but the fragmentary nature of these bones prevented identification of the particular species.

Features

Several types of archaeological features were identified at sites within the project area. Fire-affected rock features were the most common type identified during this study, followed by rock enclosures and stone cairns (Figure 6). Nearly 250 fire-affected rock features were identified at 98 sites during the study. Of these sites, 63 were in the areas south of the San Felipe Hills and 35 were in the areas to the north. Ninety-three percent of the sites containing fire-affected rock features also contained lithic artifacts, and 56 percent contained ceramics. Archaeological testing on fire-affected rock features in areas near Ocotillo Wells SVRA (McCorkle-Apple et al. 1997; Schaefer et al. 2012) has shown that many of these features contain cultural artifacts or show evidence of deliberate placement of the rocks themselves.

Figure 7. Constructed rock circles (top: Ocotillo Wells SVRA; bottom: lower Borrego Valley).

Aside from the single possible bedrock mortar mentioned above, the only other feature type that was more common in the areas north of the San Felipe Hills is the constructed rock circle (Figure 7, top). There has been much speculation over the purpose and use of these features and whether they represent fish traps, storage enclosures, or habitation features (e.g., Hines et al. 2002; McCorkle-Apple et al. 1997). None of the constructed rock circle enclosures were identified at sites south of the San Felipe Hills, although there were a few examples of cleared-circle-type features recorded at sites in the south, and there are similar constructed rock circles located at sites in the lower Borrego Valley (Figure 7, bottom), south of San Felipe Creek and southwest of the San Felipe Hills (e.g., CA-SDI-1806, SDI-1808 through SDI-1811, SDI-2641, SDI-2643 through SDI-2648, SDI-6253, and SDI-6254).

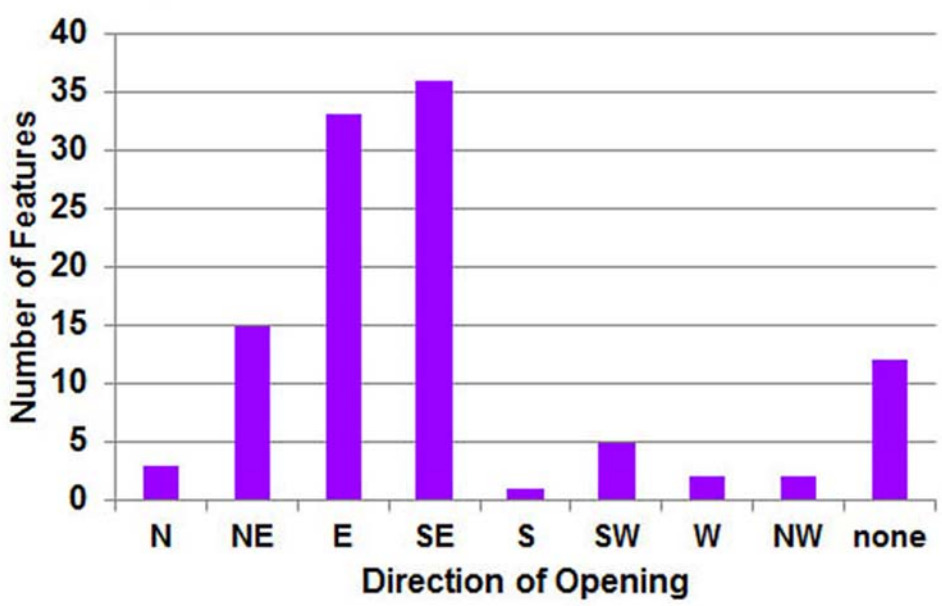

Figure 8. Rock circle features: direction of opening.

SITE FUNCTION

In an effort to determine if the rock circle features were used as fish traps, an analysis was undertaken, looking at the direction in which the "opening" of the circle was placed. The results of this analysis found that the vast majority of these enclosures had openings that faced southeast, east, or northeast, which would have been downslope, into the deeper water of the lake (Figure 8). It should be noted that openings facing these directions are also situated away from the prevailing winds, which typically blow from the west-northwest. Additionally, it was also noted that only some (47 out of 135) of these features show evidence of tufa deposits, which developed on rocks that had been submerged as calcium carbonate precipitated from the evaporating waters of Lake Cahuilla. If these features were used as fish traps, meaning that they would have been submerged or partially submerged in the waters of the lake when they were constructed or used, it would be expected that more of these features would be covered with tufa deposits.

A separate data analysis was undertaken to see if these enclosures were used as habitation features. For this analysis, the size of the rock circles was examined. The results (Figure 9) showed that a majority (89 out of 123) were less than 4 m in diameter, which is small for a habitation feature, but may have sufficed for a temporary wind-shelter, another specialty use, or as a storage feature. Previous testing on similar features (e.g., Gruver 1999, 2000; McCorkle-Apple et al. 1997; etc.) indicated the presence of artifacts and charcoal within some rock circle features. Only a few of the rock circles examined during the 2008-2011 study contained visible artifacts or evidence of fire within the circle, but blowing sand may have covered up artifacts or dispersed charcoal, leaving little to be seen without subsurface testing.

TIME PERIOD

Another research question that was examined during this study was time period of occupation and use. Figure 10 shows some of the many interpretations of the previous sequences of Lake Cahuilla infillings (Cleland 1999; Hines et al. 2002; Laylander 2006; etc.), including some recent reevaluations based on sediment cores and radiocarbon dating of tufa deposits (Li 2007; Li et al. 2008). However,

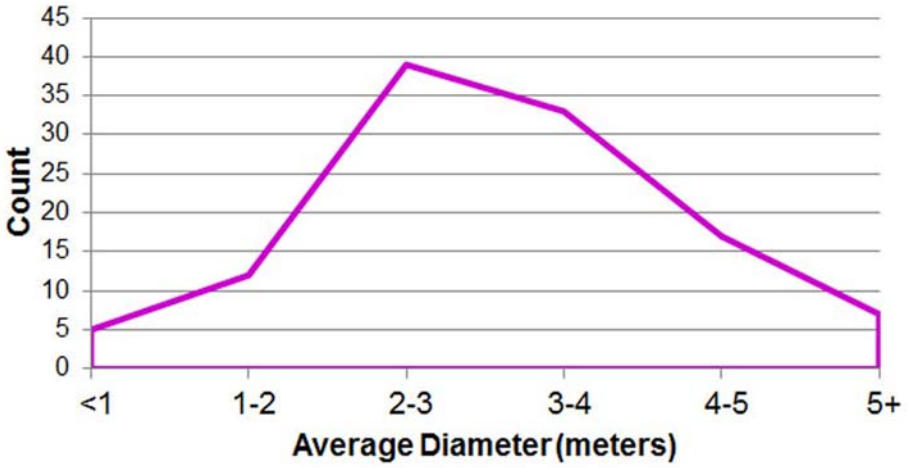

Figure 9. Rock circle features: diameter.

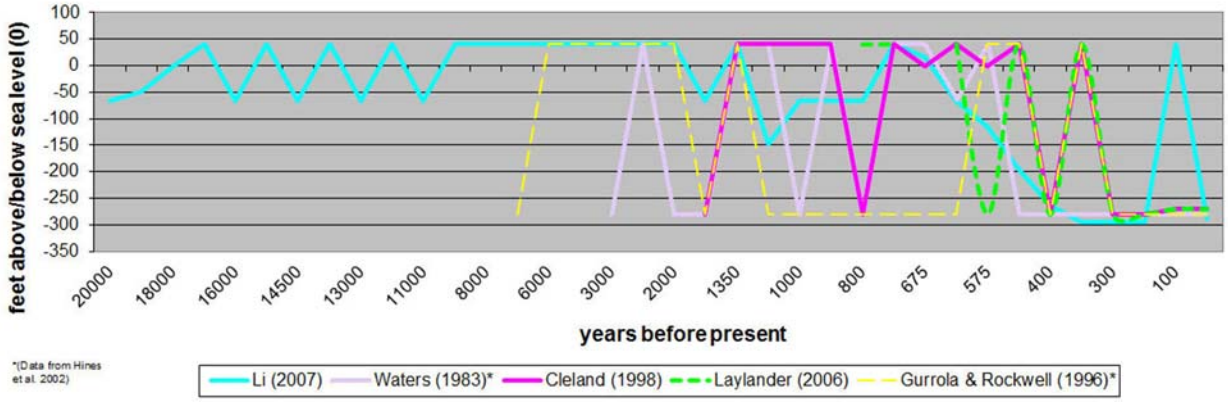

Figure 10. Comparison of Lake Cahuilla chronologies.

issues with the reliability and accuracy of radiocarbon dating of tufa deposits make these results uncertain.

Only three sites within the study area have been radiocarbon dated using charcoal from fire features (Darden Hood to Margaret Kress, letter report, June 2, 2011). The oldest, at A.D. 1030 to 1200, is located in the area south of the San Felipe Hills. The other two are located in the areas north of the San Felipe Hills. Due to the lack of radiocarbon dates, other methods were employed to determine relative dates for many of the sites that were examined during the study.

Tufa is a soft, porous rock composed of calcium carbonate and formed by precipitation from water, such as the evaporation of the waters of Lake Cahuilla. Several sites were found to contain artifacts or features encrusted with tufa (Figures 11 and 12). This indicates that they were submerged following manufacture, pointing to initial use prior to one or more infillings. Radiocarbon dating of the tufa adhered to these artifacts and features may give indication of when they were made and help determine when the sites were occupied. Some of these sites also contain highly weathered lithic artifacts, a lack of pottery, and possible early tool types such as Pinto and Elko projectile points or larger "spear point" artifacts, hinting at earlier occupation.

However, the majority of the sites contain time-diagnostic artifacts and features that are associated with the Late period, such as pottery, Cottonwood triangular and Desert side-notched projectile

Figure 11. Tufa-covered core tool.

points, arrowshaft straighteners, and cremations. Obsidian from Obsidian Butte can be another temporal marker because the quarry itself is located 130 ft. below sea level and would only have been exposed during times when the shoreline of Lake Cahuilla was below that height.

CONCLUSIONS AND FURTHER RESEARCH

Do the San Felipe Hills represent a territorial divide between the Desert Cahuilla and the Kamia? There are certainly some tantalizing differences between the areas to the north and those to the south of these hills. The lack of constructed rock circles in the south may simply be a case of a lack of easily accessible materials needed to construct such features in those areas. There are fewer tabular sandstone formations present in the area south of the San Felipe Hills; however, there are other rocks present in this area that were used to construct the relatively abundant fire-affected rock features. It has been shown that constructed rock circles in this region were not only made from the tabular sandstone; those in the lower Borrego Valley were constructed with granitic rocks, but otherwise appear quite similar in shape and size. So perhaps the presence of the "cleared circles" and lack of the constructed rock circles in the southern areas do indicate a cultural difference from the areas north of the San Felipe Hills; the results of this data analysis only show the need for additional information and research.

The distribution of brownware and buffware pottery, wonderstone, obsidian, and other site constituents also seem to indicate differences between the areas to the north and south of the San Felipe Hills, but more research is needed to fully determine where the territorial divide is located. Additional sourcing of pottery and wonderstone from the sites at Ocotillo Wells SVRA could help clarify these apparent patterns of distribution and may identify cultural differences between the areas north and south of the San Felipe Hills.

Further research should also be conducted on the rock circle features to get a better understanding of their function and use. Although several have been excavated, additional test excavations on various-sized rock circle features could help determine if certain sizes had different functions. Additional analysis

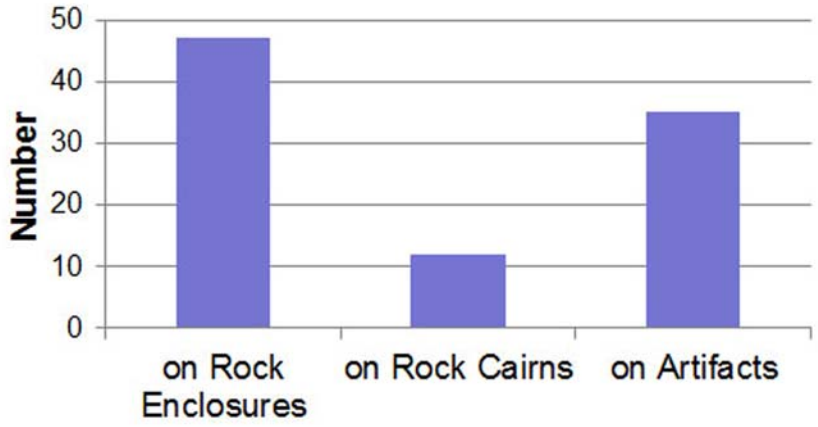

Figure 12. Tufa deposits on cultural resources.

of tufa deposits on rock circle features, looking at feature size and the direction of opening, may show other patterns that were not examined during this study.

In terms of the time period of use, additional radiocarbon dating needs to be done. There are numerous fire-affected rock features containing both cultural materials and charcoal that would be excellent candidates for radiocarbon dating. Although radiocarbon dating of tufa deposits has some issues, there are ample opportunities at Ocotillo Wells SVRA to test and compare dating results to see if there is a way to obtain accurate dates from tufa deposits. Studies that include tufa deposit dating may help establish a more definitive timeline of when these sites were occupied and used.

It is likely that there was a transition zone between the territories of the Kamia and the Desert Cahuilla, an area where the two groups intermingled and traded. The presence of Lake Cahuilla, especially in those times when the lake was full and the resources were plentiful, would have created a natural corridor of trade and interaction along its shoreline, much like the corridor of trade and interaction along the Pacific Coast of California.

There is plenty of research yet to be done at Ocotillo Wells State Vehicular Recreation Area. I hope that someday soon we will better understand when and how these sites were being used, and by which culture. Until that time, I would like to thank all those who helped with the 2008-2011 study as well as previous researchers, especially those involved in the 1998 survey, for all their hard work and input.

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