



# MOJAVE NATIONAL PRESERVE

## Association of Prehistoric Human Habitation with Springs and Wetlands

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Mojave National Preserve investigated the relationship of prehistoric sites with perennial springs under grant Grant #03-10 from the Western National Parks Association.

Prehistoric archaeological sites are spatially related to springs but also to other natural resources. Local environmental factors, such as exposure and topography, also influence their location.

### Introduction

We were interested in whether or not a relationship exists between perennial (year-round or permanent) water sources in Mojave National Preserve and the locations of prehistoric sites (sites that pre-date European presence). If so, what kinds of prehistoric sites are present and do they necessarily owe their placement on the landscape to the presence of water? Inhabitants of arid landscapes are forced to retreat to permanent water sources and exploit the resources that exist around them during extended droughts. Several archaeologists elsewhere have used these observations as the basis for explanations of the distribution of archaeological sites. Mojave National Preserve has been inhabited for perhaps 10,000 to 12,000 years and was the traditional homeland of the Patayan or ancestral Mohave people and later for the Chemehuevi (Southern Paiute). Very little archaeological research has been undertaken in this area, particularly with regard to the Patayan, so one goal of the present study was to contribute to our understanding of this ancient culture.

### Methods

We used a combination of statistical and field survey methods in this research. Large databases of archaeological sites were analyzed using spatial statistics followed by four and one half months in the field surveying, documenting, and mapping sites in eight study areas. Study areas were defined by topography, with neighboring valleys and independent drainages considered outside of the zone of influence of the water resource being examined. Surveys of these areas were conducted on foot with field crew members separated by no more than 15 meters following measured transects across the terrain. Formed tools and other artifacts were collected if it seemed that they could tell us something about the prehistoric record of settlement.

Several different site types were found during the survey. Habitation sites were defined as localities that showed a variety of activities such as tool making, food processing, food preparation, and prepared sleeping sites. Food processing sites were defined by artifacts that were used in preparing plants or animals for food either for immediate

consumption or for storage. Quarries (for obtaining stone for tool manufacture), with the exception of a single site, were found to be isolated extraction areas with no evidence of any other activity occurring at the location. Scatters of stone flakes or chips, called debitage, are associated with the working of stone into tools such as scrapers or arrowheads. Cairns (piled rock monuments) generally have been interpreted as trail markers with various meanings defined by their construction method, the number of stones used, or other attributes. Fragments of pottery (shards) are found all across the Mojave Desert but not much is known about who made the original ceramic vessels. The presence of ceramics was noted at most of the sites in this study. Rock shelters consist of naturally hollowed out shallow caves or in some instances habitation areas located in the hollows or shade of prominent boulders or boulder clusters. Temporary or permanent brush hut structures were evident as shallow excavated round depressions of 2.5 to 3 meters in diameter (sleeping circles). Trails were recorded, however, it was difficult to distinguish from those of cultural origin as both animals

and humans tend to follow the same paths across ridges, through passes, and between water sources.

## Results

Our research suggests that prehistoric sites are strongly clustered and spatially correlated with springs, especially perennial springs. In the field, prehistoric sites were found to be roughly 4 kilometers (2.5 miles) from the nearest spring on the average. Based on our statistical analyses we can say that if site locations were not generally associated with spring sites and they were randomly distributed across the Preserve, their average distance from the nearest spring would be more than 8 kilometers (5 miles).

It was evident from the field survey that some sites were located near springs simply because of the presence of water while others, such as quarries, may happen to be near a spring but only by chance. Prehistoric quarries are located in areas with outcrops of rock types, such as rhyolite and chert, that are suitable for making stone tools and only some of these are found near water sources.

One cluster of sites was located in a valley bottom near what is now a dry, ephemeral water course. These sites were probably occupied when water was flowing in the stream and grasses were abundant during periods that were particularly wet. Unfortunately we were not able to find datable material associated with the sites in this area that could be used to tell when these wet periods took place.

The distribution of sites in another area indicated that local

environmental factors such as the direction and strength of the wind and protection from the sun influenced the location of a habitation site, not just the presence of a spring or seep. Seed and other food processing sites at yet another area were clustered along drainages to a lake as well as along prehistoric shorelines. One of these site was strictly a plant processing area from which materials were then transported to other areas where more suitable seasonal or permanent camps might be located.

Only one agave-roasting pit was found during the survey. Agave roasting involved the construction of a large pit in which to bake the heart of this tough yucca-like plant. The roasting pit was associated with a habitation site that included cleared sleeping circles (over which shelters would have been built), lithic debitage, and milling implements that would have been used to mill or grind the agave and other plant foods. Other features indicated additional utilitarian tasks were carried out here, perhaps while the agave was roasting. Two of the water resource areas contained no sites whatsoever. Steep ridges and narrow drainages geographically defined one of these areas in such a way that there were very few places that would provide shelter. The second spring site was located in a lava field with very few trees and no shelter of any kind in this highly exposed area.

## Summary

It is characteristic of the Mojave Desert landscape that water sources are rare and widely separated from one another. A statistical analysis of the relationship between the locations of known water sources and

previously recorded prehistoric archaeological sites was conducted. This analysis showed conclusively that certain types of sites, notably habitations, are spatially clustered around perennial springs and other water sources. Twelve areas with known water sources were identified and examined in the field. The results of the fieldwork largely confirmed the association identified statistically. But on closer examination, the details of each site location show a more complex relationship between the location of sites and local environmental factors. It is clear that water was just one essential resource to the Native Americans who formerly inhabited this area. Prehistoric sites contain evidence that provides a record of the intricate relationships between human culture and the many natural resources they used. This study has contributed to our knowledge of those relationships while confirming the strong association between prehistoric desert inhabitants and the water sources they used, particularly perennial (year-round) springs.

The staff at Mojave National Preserve is continuing to gather additional information on spring sites and the plants and animals they supported. They are also recording and studying the materials at additional prehistoric archaeological sites in an effort to expand upon what was learned in the original pilot study described here.