

HISTORIC PRESERVATION AND NEPA COMPLIANCE: A CASE STUDY

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ABSTRACT

One issue common to many archaeologists is the protection and preservation of cultural resources within the framework of compliance with the National Environmental Policy Act (NEPA). The Off-Road Vehicle (ORV) area of Edwards Air Force Base (AFB), located in the western Mojave Desert, presents a case study involving the land use of an area seemingly incompatible with the goals of historic preservation. The 10,000-acre ORV area at Edwards AFB has been in operation since the mid-1970s and 81 archaeological sites have been identified there. However, the impacts to those sites from ORV activities have never been evaluated. The evaluation, preservation, and protection of those sites is currently under examination. An environmental assessment and management plan are also being prepared for the ORV area, making it an excellent case study of alternatives and approaches for the protection of cultural resources within the context of NEPA compliance.

Introduction

The need to provide recreational opportunities (to provide a high quality of life) and to acknowledge the popularity of off-road vehicles was first recognized by President Nixon in 1972. In February of that year, he issued Executive Order 11644, "Use of Off-Road Vehicles on the Public Lands," which mandated that federal agencies designate specific areas and trails on which the use of ORVs would be permitted, as well as designate areas in which the use of ORVs would not be permitted. The order required that designated areas be based on the protection of resources, the promotion of safety of all users of the land, and the minimization of conflicts among the various uses of the land. This order was amended by President Carter in 1977 with Executive Order 11989, which allows for the closure of areas and trails to ORVs if it is determined that ORVs are causing or will cause considerable adverse effects to resources, including soil, vegetation, wildlife and wildlife habitats, and cultural or historic resources.

In compliance with these Executive Orders, Edwards AFB established two ORV areas within its boundaries which provide outdoor recreational opportunities for military and civilian employees of the base (Figure 1). ORV Area 1

contains approximately 100 acres and is located just northeast of the base housing area in the northern portion of the base. This area has been established as a motorcross area and has been heavily disturbed. No cultural resources have been identified there. Therefore, this paper will only discuss ORV Area 2. ORV Area 2, hereafter referred to as the ORV area, includes 10,376 acres and is located just west of the base housing area in the northwestern portion of Edwards AFB (Figure 2). This area contains approximately 75 miles of dirt roads and trails available to ORV users. This ORV area is classified as a "Limited" ORV area. This designation means that all ORV activities within the area are restricted to the designated and established trails. ORV users are prohibited from riding off of these roads and trails. A total of 81 archaeological sites have been identified within this area.

Previous Research

The ORV area on Edwards AFB has been in use since the 1970s. In 1976, an Environmental Assessment (EA) was prepared to evaluate the impacts from ORV activities in the two ORV areas. At that time, no surveys for cultural resources were conducted although the document recommended that a survey be performed.

Between 1976 and 1994, six cultural resource studies were conducted in the ORV area. These surveys were both linear and block surveys and included a survey for the proposed LNG Gas Transmission Pipeline (Clewlow 1976), a survey of approximately 2,000 acres within and adjacent to the ORV area (Sutton 1979), a survey of 320 acres as part of the basewide cultural resources sample survey (Greenwood and McIntyre 1980, 1981), a survey of approximately 200 acres for dog training exercises in the Security Police Training Area (Perry 1989), a survey of 170 acres for the Peacekeeper/Challenge 1990 exercises (Computer Science Corporation 1990), and a survey of 251 acres for the enlargement of an existing borrow pit (Onzol 1995). Additional judgmental surveys and site reconnaissance were conducted in 1979, 1985, 1990, and 1995 by the Base Historic Preservation Officer (BHPO). As a result of these surveys, 63 prehistoric and historic archaeological sites were identified within the boundaries of the ORV area.

1994 Sample Inventory

In 1994, Tetra Tech was tasked to perform a sample survey of the ORV area. Prior to that time, the majority of the surveys that had been conducted in the ORV area had consisted of only small portions of the ORV area and had been conducted to identify resources that may be disturbed by activities other than ORV activities. The goal of the Tetra Tech sample survey was to characterize the types of sites present in the ORV area and to assess the impacts from ORV activities to those sites. The method employed to accomplish this goal was to conduct a 20 percent random sample survey comprised of 13 randomly selected quarter-section quadrats and an additional 10 percent judgmental survey comprised of seven (7) judgmentally selected areas of varying sizes and shapes. These areas were selected based on several factors including locations of known sites, environmental variables expected to contain sites, and areas where few or no previous surveys had been conducted.

The total acreage covered for the project was 2,965 acres. As a result of the random sample and judgmental surveys, 18 new sites

were identified in the ORV area including 12 historic sites and 6 prehistoric sites. In addition, site forms were updated for three historic sites (Chandler *et al.* 1995).

Management Concerns

By 1995, seven separate cultural resource inventories had been conducted in the ORV area. As a result of all of these surveys, a total of 81 sites had been recorded in the ORV area. This included 46 prehistoric, 32 historic, and 3 military-era sites. The large number of cultural resources identified, along with other environmental concerns, led to a critical examination of the ORV area by the base. The elimination of the ORV area was only briefly considered. The lack of a designated ORV area would force ORV users to travel a great distance to other public ORV/Off-Highway Vehicle areas located off base. In addition, many ORV users may simply start riding their ORVs on secluded areas of the base. The vast size and territory of the base would make it impossible to control this. Furthermore, it is believed that if there is a designated area where ORV users can legally ride, they will choose to do this rather than ride illegally in other areas.

The next option under consideration was to designate a new area as the ORV area. This option was also quickly dismissed as extremely impractical. An environmental analysis would be required for the new location and the new area would be subject to the impacts already sustained by almost 20 years of ORV activities in the existing location. Furthermore, the proximity of the existing ORV area to the base housing and dormitories (where most riders originate) required few access routes. The best solution appeared to be to maintain the ORV area in its current location. However, a reduction in the overall size of the area was proposed.

Under this proposal, over 2,250 acres will be eliminated from the ORV area, reducing the total acreage of the area to 8,117 acres (Figure 2). The environmental consequences of the proposed reduction in size of the ORV area is currently being evaluated in an environmental assessment (U.S. Air Force 1996). Sixty-five miles of dirt roads and trails would still remain

within the ORV area including the ridgeline that provide the most challenge to ORV users. This reduction in size, designed to protect important cultural resources and sensitive plant and wildlife species, effectively removes 47 percent of the sites (38 sites) from within the ORV area boundaries, resulting in a beneficial impact to the cultural resources.

As a result of the proposed change to the ORV area, 43 sites, including 23 prehistoric, 17 historic, and 3 military sites, will remain within the boundaries of the ORV area. Therefore, these 43 sites require evaluations for eligibility to the National Register of Historic Places (NRHP). In addition, impacts from ORVs, as well as from other uses of the land have to be assessed. Other land uses within the ORV area include mountain biking, jogging, hiking, and horseback riding.

Preliminary evaluations for eligibility for the NRHP were made for the 43 sites remaining in the ORV area. As a result, 23 sites were determined to be not eligible for the NRHP, including 6 prehistoric, 14 historic, and 3 military sites. These determinations were made based on sparse archaeological remains on these sites, limited research potential of the sites which surface documentation and archival research exhausted, and poor integrity of the sites due to severe disturbances from ORV and military activities.

Preliminary evaluations of NRHP eligibility determined that 20 of the sites remaining in the ORV area required additional work. It was recommended that further work be performed on 17 prehistoric and 3 historic sites. Evaluation of the historic sites included archival research for all three historic sites, additional detailed surface documentation of two sites, and test excavation of one site. Evaluation of the prehistoric sites included test excavations of all 17 sites and additional detailed surface documentation of 5 sites (Chandler *et al.* 1996).

Site Evaluations

Because archival research conducted for the historic sites has not linked those sites with a significant event or patterns of events beyond

general mining activities, the occupants of the sites were not locally or regionally prominent, and none of the 20 sites contain standing structures and no evidence exists that represents distinctive construction methods or the work of a master, it was determined that none of the 20 archaeological sites were eligible for inclusion in the National Register under Criterion A, B, or C. Therefore, all 20 sites were evaluated under Criterion D for their potential to contribute information to the understanding of regional prehistory or history.

Under Criterion D, the research potential of the site is an important factor in consideration of the site's eligibility to the NRHP. The research potential of a site is assessed through an examination of the types of data the site contains and the ability of this data to be applied to research issues and questions. If a site contains many types of data sets that can address a variety of research issues, the site is considered to have good research potential. If the site has few data sets that can only be applied to one or two research issues, the site is considered to have limited research potential. A site may not be eligible for the NRHP if it contains limited research potential and the data sets within the site are redundant information that can be provided by other sites located within the region. Furthermore, in most cases, field investigations may exhaust the research potential of such a site. This does not mean that the information from the site is gone and can no longer be applied to research questions but rather that the data may no longer exist in the field in the form of archaeological remains, but instead have become part of the permanent archaeological data base through the site record and the curated artifacts. When this occurs, fieldwork will not produce any additional data from the site beyond what is already recorded in the site record and what exists in the curated artifacts. The research potential of the site is then considered to be exhausted. In these cases, the site may not be considered eligible for the NRHP because the archeological remains do not contain further research potential.

The physical integrity of a site is also a critical factor for evaluating a site for NRHP eligibility. There are seven elements of physical integrity to

consider including location, design, setting, materials, workmanship, feeling, and association. A site need not retain all seven elements of integrity to be eligible for the NRHP; however, if a site only contains integrity of one or two of these elements, and the rest are lacking, the overall integrity of the site is considered to be limited. The lack of integrity may affect the research potential of a site and subsequently its eligibility for the NRHP.

Historic Sites

The three evaluated historic sites are all mining-related sites. Site EAFB 251 (CA-KER-539H) is a mining site that contains a backfilled mine shaft, a built ramp of mine tailings, and a graded area that may have served as the foundation for a small structure or tent. The site contains a large, dispersed concentration of historic artifacts, predominantly cans and glass. These artifacts comprise four major functional categories including household, architectural, personal, and miscellaneous items. Temporally diagnostic artifacts on the site indicate a date of occupation primarily between 1905 and 1940 with a discrete cluster of dates between 1915 and 1935. Archival research and the archaeological remains of the site suggest that this site was not occupied as a main residence, but rather was utilized solely for the purposes of mining. The site is bisected by three dirt roads and has been greatly disturbed by ORV and military activities in the area. Therefore, the integrity of the site is poor. The research potential of the site is limited and has been exhausted by the field documentation and test excavation conducted on the site. Therefore, this site is not considered to be eligible for the NRHP.

Sites EAFB 1961 (CA-KER-4432H) and EAFB 1962 (CA-KER-4431H) each consist of a single prospect pit. Several wood fragments which may represent a stake were also observed on site EAFB 1961. No artifacts were observed on site EAFB 1962. Archival research for these sites is pending; however, based on the limited archaeological remains, the data potential of these two sites appears to be exhausted through the surface documentation that has already been conducted and the archival research which is in progress. Therefore, these

sites are not considered to be eligible for the NRHP.

Prehistoric Sites

The 17 evaluated prehistoric sites consist of 3 milling stations, 7 rock features/hearths, one lithic scatter, and 6 temporary camps. Sites are discussed below by functional category.

Milling stations. Milling stations consist of milling-related artifacts such as manos, metates, mortars, pestles, and milling features such as bedrock mortars and grinding slicks. Milling stations are food processing locations and contain few or no lithic artifacts, burned bone, or fire-affected rock. Milling stations are considered limited activity locations. The three milling stations include site EAFB 889 (CA-KER-2440), site EAFB 1919 (CA-KER-4397), and site EAFB 1923 (CA-KER-4403).

All three of these sites contain between three and five milling-related features located on bedrock outcrops. No artifacts were recorded on any of these sites, except for one chert biface fragment recovered from the surface of site EAFB 889, and three pestles found in association with the features on site EAFB 1919. Each site was tested for subsurface deposits. No subsurface deposits were encountered on any of the sites. All three of the sites appear to have been utilized solely for the processing (i.e., milling and grinding) of food. There is no evidence of any other activities occurring on these sites.

Based on the sparse archaeological remains associated with these sites, the research potential of the sites is severely limited. Furthermore, any data these sites can provide is redundant with information provided from sites with better integrity. The current level of field documentation and test excavations conducted on these sites has exhausted their research potential. Therefore, all three of these sites are not considered to be eligible for the NRHP.

Rock features/hearths. This site type consists of thermally altered rock which may represent roasting pits, hearths, and other concentrations of fire-affected rock. These sites typically represent food processing locations but

may have also served for warmth or for heat treating other materials. These sites contain few or no lithic or milling-related artifacts or features and are considered limited activity locations. This site type included the greatest number of evaluated prehistoric sites in the ORV area (n=7), including sites EAFB 1230 (CA-KER-4317), EAFB 1553 (CA-KER-4171), EAFB 1921 (CA-KER-4401), EAFB 1929 (CA-KER-4392), EAFB 1930 (CA-KER-4393), EAFB 1931 (CA-KER-4394), and EAFB 1960 (CA-KER-4433). During Phase II field investigations, it was discovered that portions of site EAFB 1920, a temporary camp, extended to within 50 meters of site EAFB 1921, a hearth site. Therefore, it was recommended that the two sites be combined and they were evaluated for NRHP eligibility together as one site. They are discussed under the category of temporary camps.

The six remaining hearth sites all contain between one and five rock features. However, only half of these contain fire-affected rock. The placement and densities of the surface features on sites EAFB 1929, EAFB 1930, and EAFB 1931 created uncertainties as to whether the deposition of the sites was the result of natural or cultural processes. Therefore, these three sites were excavated to determine the function or association, if any, of the features. In all three cases, subsurface deposits did not extend below 17 centimeters and no cultural materials were recovered. All three of these sites are located in proximity to drainages and may be the result of natural erosion or flooding. Because there is no strong indication of a cultural origin for these three sites, the sites are not considered eligible for the NRHP.

The remaining three rock feature/hearth sites all contain some fire-affected rock. However, only one of the three sites contains extensive subsurface deposits, site EAFB 1960. In this site, subsurface deposits including numerous fire-affected rocks and large amounts of charcoal were encountered to a depth of 60 centimeters. Macrofloral samples were also recovered from the feature. This site, therefore, has the ability to address research questions pertaining to chronology, subsistence, site function, and settlement patterns. However, the

data necessary to address these research questions have already been obtained from the field documentation and test excavation conducted on the site. Therefore, the research potential of the site is exhausted and the site is not considered eligible for the NRHP.

The remaining two sites, EAFB 1230 and 1553, contained little or no fire-affected rock and did not contain subsurface cultural deposits below a depth of 20 centimeters. Therefore, these sites have severely limited research potential which is exhausted by the current level of field documentation and test excavations. Therefore, these two sites are not considered eligible for the NRHP.

Lithic scatters. Lithic scatters consist solely of chipped stone artifacts. No features, burned bone, milling-related artifacts or features, or fire-affected rock are present on these sites. Lithic scatters are considered limited activity locations. The only lithic scatter evaluated in the ORV area was site EAFB 1562 (CA-KER-4180).

Site EAFB 1562 contains over 500 lithic artifacts but no features. One multidirectional core was found on the site. The sole activity of the site appears to be related to the manufacture of lithic tools; however, no formal tools were observed on the site. Subsurface excavations revealed deposits to a depth of 60 centimeters. Although the site can address research questions of site function, lithic procurement, and settlement patterns, the data necessary to address these questions have been adequately obtained from the field documentation and test excavations conducted on the site. Therefore, the research potential of the site is very limited. Furthermore, the integrity of the site has been affected by extensive ORV activities. Based on these considerations, the site is not considered to be eligible for the NRHP.

Temporary camps. Temporary camps are sites that contain artifacts or features that represent two or more different activities. These activities are grouped in general terms only (i.e., food processing through milling and grinding, tool manufacture through lithic reduction, and burning for cooking, warmth, or heat treating materials). Subcategories of activities, such as

biface production versus core reduction, are not identified at this level. Temporary camps can include lithic artifacts, burned bone, fire-affected rock, and milling-related artifacts or features. Temporary camps are typically short-term occupation sites for a group of people. However, the multiple activities represented on the site may have occurred during different occupations of the site at different times. Six temporary camps were evaluated in the ORV area including site EAFB 597 (CA-KER-2039), site EAFB 1552 (CA-KER-4170), site EAFB 1920 (CA-KER-4400), site EAFB 1922 (CA-KER-4402), site EAFB 1927 (CA-KER-4404), and site EAFB 2097 (CA-KER-4466).

All six of these sites contain artifacts or features representing two or more activities including lithic artifacts, fire-affected rock, and milling-related artifacts or features. In four of the six sites, sites EAFB 597, EAFB 1552, EAFB 1922, and EAFB 1927, the archaeological remains are sparse and consist of only a few features with scattered lithic artifacts or milling-related artifacts (e.g., a metate observed in association with a hearth feature on site EAFB 1927). Subsurface deposits were sparse on all of these sites or were evenly disturbed by extensive rodent activities. Based on the limited archeological remains on these four sites, the research potential appears to be limited and exhausted through current field documentation and test excavations. Several of these sites have also sustained disturbances from ORV activities affecting the integrity of the sites. The data the sites can provide are also redundant with information contained in sites with better integrity. Therefore, these four sites are not considered to be eligible for the National Register.

Site EAFB 2097 contains seven fire-affected rock features, three lithic concentrations, two milling-related artifacts, and scattered large mammal bone (livestock-like). Based on the site assemblage, it would appear that several different activities occurred on this site, including the butchering or processing of livestock. This may indicate a protohistoric occupation. Although this site function appears to be rare in the area, the research potential of the site is limited. The site contains very shallow

subsurface deposits only in its features and sparse subsurface materials in the concentrations. The data necessary to address questions of animal procurement and processing have been obtained from the field documentation and test excavation and, therefore, the additional research potential of the site is very limited. Furthermore, the integrity of the site is lacking. Although the site can also address research questions of lithic procurement, subsistence, site function, and settlement patterns, this information is redundant with information that can be better provided from sites with good integrity. Therefore, this site is not considered to be eligible for the NRHP.

Site EAFB 1920, together with site EAFB 1921, is the largest and most extensive site evaluated in the ORV area. The combined site is comprised of 27 rock features and 4 lithic concentrations containing over 1,000 chipped stone artifacts of varied materials. In addition, there are groundstone artifacts, fire-affected rock, and lithic artifacts scattered throughout the site. Three projectile points were recovered from the site.

Six of the 27 features on the site were tested for subsurface deposits. Test excavations revealed extensive subsurface deposits to a depth of 80 centimeters in one feature (originally site EAFB 1921) and to a depth of 55 centimeters in another feature. Test excavations within the concentrations encountered subsurface lithic materials to a depth of 40 centimeters. The physical integrity of site EAFB 1920 is good and the site has the potential to address many different research questions including chronology, lithic procurement and selection, subsistence, seasonality, technology, and trade. Because only a small portion of the site has been excavated, the site still contains vast research potential. Therefore, site EAFB 1920 is considered eligible for the NRHP under Criterion D. This is the only site within the ORV area that is considered NRHP eligible.

Mitigation Measures

As a result of the field investigations in the ORV area, only one site, site EAFB 1920,

combined with site EAFB 1921 due to its proximity, was recommended eligible for the National Register. This site is bisected by the dirt road that marks the western boundary of the ORV area. The site has sustained some disturbances from ORV and equestrian activities in the area, especially in and around the features and concentrations located near the road. Several options have been recommended for the preservation and protection of this site. These options include:

1. A shift in the designation of the western boundary of the ORV area to eliminate the site from inclusion in the area. However, the site would still be vulnerable to impacts from mountain bikers and horseback riders.

2. Monitoring of disturbances to the site conducted on a regular basis to determine if new or additional disturbances are occurring. Disturbed areas of the site should be mapped each time and used for comparison during future monitoring.

3. Data recovery of the features and concentrations located in proximity to the road and subject to the greatest disturbances.

Conclusions

In order to comply with Section 110 of the NHPA and NEPA, the number and types of cultural resources in the ORV area had to be identified and impacts to those sites from ORV activities had to be assessed. Given budgetary constraints and the large size of the ORV area, cultural resources were identified through sampling. As a result of the sampling and previous surveys, 81 archaeological sites were recorded in the ORV area. A proposed reduction in the size of the ORV area, currently under evaluation in an environmental assessment, would protect 38 of those sites from continued ORV activities. The sites that would remain in the ORV area were evaluated for eligibility for inclusion in the NRHP. Because of limited research potential and poor physical integrity, the majority of these sites are not considered to be eligible for the National Register. The single potentially eligible resource will receive a level of protection through a combination of several

mitigation options.

As a result of these findings, it is clear that the best area for ORV activities is the current location. The area has already sustained damages from ORV use. If the location of the ORV area is moved, these damages would occur in the new location. Furthermore, only one cultural resource identified in the area is NRHP eligible and mitigation measures can protect this site from additional significant impacts. By maintaining a designated ORV area, important cultural resources located in other portions of the base can be protected from unnecessary ORV disturbances and the base can continue to provide outdoor recreational opportunities for its employees.

Notes

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