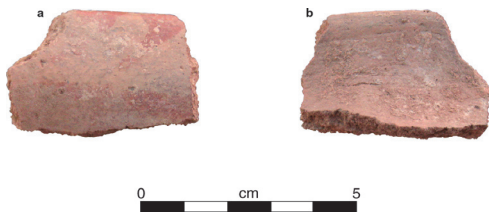




Archaeological Data Quality: Accuracy and Adequacy of In-Field Artifact Analysis

Project # 11-157

Background: Throughout the western United States, limited-collection and no-collection policies within the U.S. Department of Defense (DoD) have led to the widespread use of in-field analysis for analyzing most or all artifacts used to interpret a site. This trend counters a century-long practice of collecting samples of surface artifacts during field investigations. The policies are based on the assumptions that (1) in-field artifact analysis is comparable in quality to laboratory analysis, (2) in-field-analysis results can be accepted without question, and (3) future research and management decisions will not need access to artifacts. Despite the heavy reliance on in-field analysis for inventory and evaluation in DoD cultural resource management, very little is known about how accurate in-field analysis really is or how adequate it is for site interpretation.



Digital field photographs of the (a) interior and (b) exterior surfaces of a Dragoon Red-on-brown ceramic rim sherd documented during fieldwork at the Soldier Creek site (AZ EE:7:164 [ASM]), Fort Huachuca, Arizona.

Objective: The main objectives of the project were to measure the levels of agreement between observers according to observational method, training, artifact attribute, and site and to assess the degree to which errors in artifact identification could affect interpretation of a site. A further goal was to provide recommendations for improving the performance of in-field analysis.

Summary of Approach: The project consists of an experiment to test the accuracy and adequacy of in-field analysis at two project sites—one on Fort Huachuca, in southeastern Arizona, and one on Fort Bliss Military Reservation, in south-central New Mexico. At each of these sites, samples of ceramic and lithic artifacts were documented by two separate field crews, resulting in two separate sets of field identifications for the same individually numbered artifacts. The documented artifacts were then collected and subsequently analyzed in a laboratory setting. Laboratory analysis was conducted by trained specialists who performed analyses using either (1) the physical artifacts or (2) only digital field photographs of the artifacts. The results of these analyses were quantitatively and qualitatively assessed to test for the levels of agreement between artifact identifications made in the field by

archaeological field technicians and those made in the laboratory by trained specialists using either the physical artifacts or digital photographs of the artifacts. These results were further explored to assess the potential effects on site interpretation.



Digital field photographs of the (a) obverse and (b) reverse surfaces of a chert biface documented during fieldwork at FB 9853, Fort Bliss Military Reservation, New Mexico.

Benefit: Continued reliance on in-field analysis could impede the mission of the U.S. Military Services by increasing evaluation and data recovery costs, causing mission delays, and undermining the scientific validity of DoD investigations. This project provides much-needed baseline data to assess the accuracy and adequacy of in-field analysis. A series of recommendations for further assessment and improvement of in-field-analysis results was also developed as part of this project.

Accomplishments: This project showed that, on average, only around 50 percent of artifact identifications made in the field or using digital photographs were consistent with laboratory identifications. Both in-field analysis and digital-photograph analysis routinely misidentified artifact types and attributes and often misidentified rare and important types. Systematic bias in artifact identification was common. In-field analysis was shown to be substantially less precise than laboratory analysis. Several of the primary variables that can be crucial to managing sites are derived primarily from artifact analysis (e.g., period, site function, assemblage diversity, and cultural affiliation). All of these were shown to be inadequately characterized, sometimes grossly so, when based on in-field or digital-photograph analysis.

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