DEVELOPING A MINIMALLY INVASIVE PROTOCOL FOR ASSESSING SITE ELIGIBILITY ON THE NORTH TRAINING AREA, CAMP GUERNSEY, WYOMING

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Abstract

The North Training Area (NTA) of Camp Guernsey is located within the Harriup Uplift of eastern Wyoming an area rich in archaeological resources particularly extensive formations of toolstone quality raw materials. Because of the potential for five training exercises to impact cultural resources, the Wyoming National Guard proposed the development of an experimental testing protocol of selected sites using minimally invasive methodologies that included geophysics and small diameter auger probes. Minimally invasive testing was proposed for sample areas within a range of site types from a variety of landforms to assess the National Register of Historic Places significance of these areas within a landscape framework. Results of the project assess the utility of nested geophysical survey methodologies and flighted, hollow-stem and hand-bucket auger techniques to test linkages between geomorphic setting and archaeologically preserved materials in order to answer questions about past human behavior in this dynamic landscape.

Theoretical Orientation and Research Goals

The archaeological record reflects both human adaptive systems and natural environmental systems (Binford 2001). We seek to understand how the two interweave through minimally invasive techniques. The unique combination of past human agency and continued environmental and geomorphological processes at any one site is observable in the preserved, patterned archaeological record.

Research Goals:

1) Investigate the variability of site burial and preservation across different landforms;
2) Assess how the geomorphic context is important for site integrity and preservation; and
3) Determine what, if any, geomorphic mechanisms are generalizable across landform types.

Evaluating Archaeological Resources at the NTA

Nearly 300 archaeological sites do not have an NR evaluation

Project Area Landscapes, Landforms, and Unconsolidated Deposits

Our geomorphological investigations identified seven landscapes based upon field surveys and previously published work (Denson and Botinelly 1949; McLaughlin and Harris 2005; Wyoming State Geological Survey Geologic Hazards Section 1999; Harris et al., 2006; digital map Wyoming State Geological Survey 2005) and Guernsey, WY (Harris et al., 2006; digital map Wyoming State Geological Survey 2005):

1) Drainages Formed on Pre-Tertiary bedrock;
2) Holocene Stream Valley Alluvium;
3) Pre-Tertiary Bedrock Plateau;
4) Pre-Tertiary Bedrock Plateau Remnant;
5) Quaternary Intermittent Stream Fill Valley Alluvium, Slopewash, and Colliuvium;
6) Quaternary Loess; and
7) Tertiary Bedrock Upland Plateau, Rolling Upland, and Valley Bottom.

Identifying and Defining Buried Cultural Zones

Burial context is an important factor to consider when evaluating the scientific and cultural resource value of archaeological sites. The presence of surface or even subsurface cultural material is, in and of itself, an unreliable indicator of burial integrity (Dibble et al., 1987) since “subsurface” does not necessarily translate to “stratigraphically buried” (Eckerle et al., 2011). Various processes can operate to degrade the context of archaeological deposits including:

1) Occupation trampling;
2) Post-occupational (preburial) dispersal;
3) Burial dispersal; and
4) Post-burial turbaution (Gifford-Gonzalez et al., 1985).

Auger Testing Strategies

We employed three augering systems using a nested grid and probe spacing shown in the table to the left.

- Hand Augering using a Soil Bucket Auger consists of a barrel that has a slightly inward angled cutting bit permanently welded to it which is attached to a T-handle of various lengths
- Power Flighted Auger consists of “1 in inside diameter pipe onto which is welded auger flights”
- Power Hollowstem Auger consists of “1 in inside diameter pipe onto which is welded auger flights”

Our research modeled the burial context situations for given soil matrix and predicted archaeological implications.

Geophysical Investigations and Field Observations

The left column represents expected cultural features, the middle columns reflect the potential for each of the survey instrument to identify those features, the reference column details the reference materials used to establish those expectations, and the final column details our field observations.

• Hand Auger Techniques with 1/16” screening
• Appropriate Geophysical for Expected Feature Type

Comparison between Auger and Test Excavation Results

Results of the auger testing suggest that similar patterning is observed at archaeological sites across several of the landscape formations.