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Invisible Datum
Using Electronic Marker Systems in Washington State

A major issue in effective cultural resource management is the efficient relocation of archeological sites. Once sites have been identified, subsequent protection efforts are based upon stable and secure data that can be unambiguously relocated. This past year, the Washington State Office of Archaeology and Historic Preservation, in cooperation with other federal, state, local, and tribal governments, implanted Electronic Marker Systems (EMS) markers at a variety of archeological site types in differing environments in Washington State. These sites have ongoing natural and human impacts; the goal of the project was to assess this technology for archeological applications.

The technology of EMS being employed in the field of underground utilities offers unique applications to archeological problems. Unlike surface stakes or data at a site, EMS are durable, passive markers that can be buried in auger holes, test pits, or trenches and have no visible surface presence that can be damaged or utilized by archeological vandals to locate sites. The underground utilities industry (including such fields as fiber optic, telephone, gas, water, sewer, and power) faces problems similar to those in the field of archeology. Like archeologists, they rely upon maps, dimensional measurements, GPS readings, and above-ground stakes and markers so they can, at some future date, revisit and relocate their buried facility. As often happens in archeology, the stakes and

Rick Bailey, Bureau of Land Management archeologist, holding a Ball Marker at a shell midden in Northern Puget Sound. Photo by the author.

above-ground markers disappear, inaccuracies appear in maps, GPS readings are plus or minus, and construction changes are not reflected in as-built drawings.

In order to overcome these common problems and meet the need to efficiently relocate critical underground resources, EMS technology offers an elegant solution. EMS consists of a portable locator/transmitter unit that is a compact wearable box operated on standard "C" batteries. It is attached to a shaft-based disk that transmits signals to the buried marker. The heart of EMS technology is the locator which transmits a pulse at a given frequency—the buried marker is specifically set to respond to this signal. In effect, the buried marker is a passive antenna preset to respond to one frequency and no other. These markers have no internal power sources and are made with polyethylene shells which are impervious to the extremes of temperature, chemical, and mineral conditions found in underground environments. They come in several different types that reflect underground utility industry needs and have varying ranges within which the locator must be preset to pick up the return signal. Depending upon type of marker and depth of burial, the range is one to two meters. This technology is marketed by 3M® under the trade name Scotchmark Electronic Marker System™.

Last year, with funding from the National Center for Preservation Technology and Training (NCPTT) of the National Park Service, and in cooperation with a number of archeologists representing a wide range of agencies, missions, site types, and environments, we implanted EMS markers at several archeological sites. After a season or two of vegetation growth I relocated the implanted markers to evaluate the technology and to develop guidelines for its application to archeology. The site types were diverse: a coastal shell midden on the salt waters of Puget Sound; a large historic village site recorded by Lewis and Clark on the Columbia River; a rockshelter in the Cascade Mountains; and open lithic sites in the arid sagebrush of Eastern Washington. We were able to employ these cyberstakes in a variety of common archeological activities. At the outset we agreed to emphasize a conservation ethic. We planted the cyberstakes outside the site boundaries whenever possible or planted them in disturbed areas.

We used the two most common types of cyberstakes: the Near Surface Marker (about the size of an index finger) and the Ball Marker (about the size of a softball). Both can be carried in a vest or field pack. During survey activities, it is very easy to establish an auger hole and drop the ball marker in for a permanent, non-visible datum. You can use a near surface marker to mark shovel

probes or to mark an isolated find or formed artifact find that can then be overcovered. The cyberstakes were also employed to mark the location of test units and trenches for relocation and re-excavation in the future. We also established cyber lines and grids for erosion control points to monitor the long-term impacts of both coastal and riverine erosion.

As with any type of equipment or technology there is a learning curve: over the course of the project I developed skills that enabled me to quickly relocate an implanted cyberstake located in very dense vegetation. I was able to relocate the cyberstake in a manner that did not require disturbance of vegetation or excavation of soils. I was truly able to take electronic readings while leaving only footprints.

Cyberstakes can be a very useful tool for the archeologist to supplement the standard site form and GPS reading. It is a stable, invisible datum that can be quickly relocated without disturbing the immediate area and without leaving any above-ground trace. Finally, the use of a cyberstake is an important statement by the archeologist and the agency of their commitment to return.

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Cultural Resource Management at the Air National Guard

The Environmental Planning Branch (CEVP), Air National Guard (ANG) is in the process of updating its cultural resource management (CRM) program. Under an interagency agreement, the National Park Service (NPS) developed an electronic database to support ANG efforts to manage and care for cultural resources under its stewardship. The database serves as a central depository for cultural resource and environmental information.

In 1993 and 1994, ANG installations were contacted by the NPS as the first step in collecting information about ANG lands and cultural resources. During the coming year, installations are again being contacted and surveyed to update the database. This is necessary because several installations have recently completed Cultural Resource Management Plans (CRMP). For example, Jefferson Barracks, a National Register Historic District, is evaluating archeological sites as part of an effort to ensure protection and preservation of its cultural resources.

Through a cooperative agreement between ANG and the National Conference of State Historic Preservation Officers (NCSHPO), CEVP hired a cultural resource specialist to complete the CRM database project under the direction of Dick Masse, Natural Resources Program Manager. The ANG takes seriously its stewardship responsibilities required under law and Department of Defense directives. Safeguarding its cultural resources is an extension of ANG's policy to be a "good neighbor" in the communities it serves. In consultation with the NPS, a new ANG cultural resource policy will eventually be developed and implemented.

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F-4 static display, Air National Guard Readiness Center, Andrews AFB. Photo by the author.