Relocation and Monitoring: Past Weapons of Mass Destruction

Sean Teeter, Zach Koski, Chrissina Burke

Abstract

During the 2003 field season of the Colorado State University archaeological field school, 57 projectile points were located by mapping surface scatters in the Greybull Drainage of the Greater Yellowstone Ecosystem. Students of the 2005 field season made an effort to relocate 55 of these projectile points in order to gain insight into factors contributing to the success of surface artifact relocation. Recreational GPS units (Garmin rino 110) were used to relocate the points based on previously recorded UTM coordinates with a 47.3 percent recovery rate. Fourteen previously un-recorded projectile points were located as well. Thus far the success of recovery has been attributed to several aspects; 1) GPS accuracy, which is dependent on factors such as satellite reception, 2) Instability of the active soil layer, 3) Eyesight and other human survey variables, 4) Vegetation cover, 5) Weather, and 6) Collectors removing the original projectile points.

GPS Accuracy:

Garmin Rhino GPS units were used to record and search for projectile points. At best, the Garmin 110 unit gives three meter accuracy, resulting in approximately 31 square meters of search area in an ideal situation. Accuracy is, however, affected by factors such satellite position and proximity to obstructions. One or a combination of these factors can bring GPS accuracy down to 20 meters or so: search area equals 1257 square meters. Knowing that this is a limiting factor, a search was not conducted unless accuracy was under ten meters. Several UTM coordinates were recorded by more accurate means (Trimble units with sub-meter accuracy, and EDM's with sub-centimeter accuracy) for a possible follow up study.

Washed out soil at site JC001.

Garmin 110's

Instability in the Taphonomically Active Zone:

While conducting our re-location effort it became apparent on site JC-001 that some areas had become extremely washed out, or subsumed by the taphonomically active zone or TAZ (Olszewski, 2004:39). This is important because when conducting surface survey only, below surface artifacts are not apparent and the relationship between "surface" and "subsurface" artifacts can be very dynamic in some settings. At JC-001, only one out of the 176 original surface lithics were located by two surveyors in a twenty minute time span. It is our assumption that lithics were more easily visible at this site during the 2003 field season, because other sites surveyed did not share the dry and cracked surface appearance of this site. Although it is hard to say why this site is more washed out than others, other sites may become more washed out in the future, limiting our ability to relocate artifacts.

Eyesight and Human Survey Variables:

A number of factors can play into the surveyor's ability to relocate artifacts. Surveyor's used in this study varied in experience levels from those working on an archaeological site for the first time, to undergraduates and graduates with some experience, to graduate students and one professor. Most work was done by fledgling archaeologists. Experience level complements the natural ability, (or lack there of) which may be affected by eyesight. It is also assumed that people will become fatigued over the course of the day, or at least put strain on their eyes. These are factors that may have some effect on proficiency, although without a more intensive study of the relationship between time of day, and rediscovery rate, it is impossible to say how much

Pedestrian Survey in the Greybull

Methods

A two-person team logged previously recorded UTM coordinates into a recreational GPS unit. Before heading out to search for the point, the team would refer back to previous records on each point. These records indicate color, size, material, and type of point. From there the team would follow the GPS directions to find the points. Once the team was within 1 meter of the point and between 1-5 meters of accuracy they would start the timer and perform a pedestrian survey around the area for 20 minutes. If the team relocated a projectile point they would measure it and make sure it was the same as the recorded one and then waypoint it again. If it was not a recorded projectile point the teams would then waypoint it as a new projectile point and record this in their field books.At the end of 20 minutes if the projectile point was not relocated the team marked this in their field book and moved on to search for the next projectile point

Vegetation and Weather

Vegetation was a limiting factor in the relocation effort. Vegetation has the ability to grow over a short period of time and obstruct vision. While conducting surveys in the Greybull it was evident fewer lithics were found in areas of dense grass. Although it is not clear if overgrowth had occurred between 2003, which was a year with very low precipitation in contrast to 2005, and the time of this study, the possibility seems likely.

Weather is another obvious limiting factor in survey. Rain, snow, hail, high winds, and fog were all experienced and appreciated by participants in the field season. While survey was not necessarily conducted in these conditions ,these factors have the ability to move and bury artifacts. Less dramatic weather events can obstruct vision..

Nasty weather

a

b

Collectors piles found a) in the field and b) at the cow camp.

Collectors Pile

Contemporary landuse patterns play an important role in the relocation of previously recorded artifacts. During the relocation effort at Jack Creek, the teams found several collector's piles, including a number of piles located at the Jack Creek cow camp, which lies several hundred meters away from many of the artifacts sought for relocation. Rock cairns (trail markers) were also found, indicating human modification of the landscape. This is evidence that the community was, and still is, collecting these artifacts. Educating the community about the importance of artifact and site context could improve artifact relocation in the future and possibly help build that bond of trust and respect between archaeologists and the public. Also, by letting the local community know that many of the artifacts have been recorded and are being monitored and making local groups award of the potential penalties for ARPA violations seems to have had some impact on the prevalence of artifact collection on Forest Service lands.

Rock cairn.

Conclusion

This study has shown some of the factors related to relocating artifacts, as well as giving us a better idea of how to better conduct relocation efforts in the future. By using better GPS equipment, such as Trimble units, the search area can be significantly narrowed down. It will also be beneficial to record projectile points or other items in relation to prevalent landmarks such as roads, ditches, or anything easily recognizable on the landscape. Measuring distance to such landmarks as well as taking photos of each artifacts location in addition to photographing the artifact could give us more precise locations in conjuction with GPS units. Variations in number of people searching, GPS units, and time spent, could also prove helpful. Future efforts will be directed toward coming to a better understanding of the factors relating to changing surface artifact visibility.

This study has also shown the value of relocation and monitoring efforts not only in showing processes that affect artifacts, but by virtue of the fact that additional projectile points were discovered, even in areas that had been subjected to intensive surface documentation two years earlier. Artifacts such as these are essential to creating a more realistic picture of past human land use and developing better ways to monitor changes in the archaeological record are of critical importance for long-term research and management concerns.

Department of Anthropology
C-207 Andrew G. Clark Bldg
Colorado State University
Fort Collins, CO, 80523-1787
Phone – (970).491.5447
Steeter@holly.colostate.edu
www.greybull.org

Literature Cited

Olszewski, Thomas D.
2004 Modeling the Influence of Taphonomic Destruction, Reworking, and Burial on Time Averaging in Fossil Accumulations. *Palaios*. 19:39-50.