Relocation and Monitoring: Past Weapons of Mass Destruction
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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 110) were used to relocate the points based on previously recorded UTM coordinates with a 47.3% recovery rate. Fourteen previously un-recorded 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.

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. This is an ideal situation. Accuracy is, however, affected by factors such as satellite position and proximity to obstructions. One or a combination of these factors can bring GPS accuracy down to 20 meters or so: vegetation, water, structures, and other GPS obstruction. This study has shown some of the factors related to GPS accuracy.

Vegetation and Weather

Vegetation was a limiting factor in the relocation effort. Vegetation has the potential to obscure artifacts and obstruct vision. While conducting surveys in the Greybull it was evident that the fewest artifacts were found in dense vegetation.

Methods

A two-person team logged previously recorded UTM coordinates into a national 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 GPS directions to 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 notes about 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.

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Collected Piles

Contemporary landuse patterns play an important role in the relocation of previously recorded 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 two factors that have some effect on proficiency, although without a more intensive study of the relationship between time of day, and rediscovery study, it is impossible to say how much.

Collected piles found:

Pedestrian Survey in the Greybull

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Instability in the Taphonomically Active Zone:

While conducting our re-location effort it was found that certain areas had become extremely washed out, or subsumed by the taphonomically active zone or TAZ (Oczkowski, 2004:39). This is important because when conducting surface survey only, below surface artifacts are not apparent and the relationship between ‘surface’ and ‘sub-surface’ 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 artifacts were more easily visible if 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 two factors that have some effect on proficiency, although without a more intensive study of the relationship between time of day, and rediscovery study, it is impossible to say how much.

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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 is also 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 exact artifact locations in addition to photographing the artifact could give us more precise locations in conjunction 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 surveyed. This shows importance of the research and 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.