The Pros and Cons of Tracing in Rock Art Recording: The 2005 Season at Bear Gulch Pictographs, Montana

by

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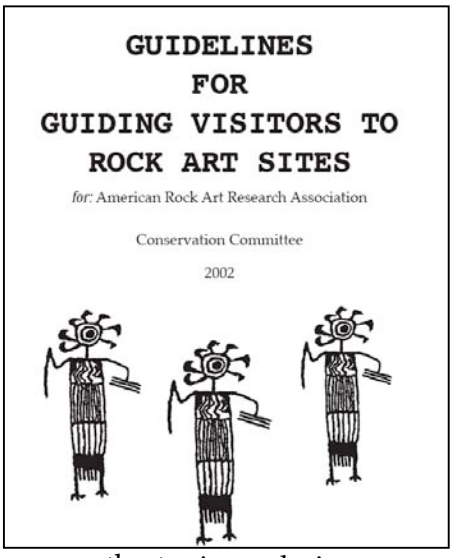
Rock art recording traditionally has included tracing figures onto clear overlays. Recently the method has been criticized because of potential impact from direct contact, and continued use has resulted in heated debate among recorders. Although other approaches that simulate direct tracing are now available, particularly computer tracing of photographs, advocates argue that field tracing is necessary for accuracy and for understanding details that are only possible from the intensive close-up interaction that occurs during tracing. The purpose of this paper is show what can be gained from both field and computer tracing, with most examples from our intensive recording project last year in central Montana. We consider the pros and cons of tracing for use in research designs and evaluation of rock art recording proposals and focus here on aspects of greatest concern.

Dr. Stan Beckensall making a rubbing of Lyham Moor panel 1, Northumberland.

Field tracing utilizes flexible clear plastic and careful marking with a fine pen or liquid ink, thus producing little pressure or abrasion to the rock surface. This is intended to create a direct exact copy of an image, ideally representing the artist's original intent and not the recorder's personal perception. Field tracing is not rubbing — a method in which a piece of paper, cloth, or other material placed on the rock surface is rubbed, usually with a hard pigment, so that the underlying uneven image, or engraving, appears on the material. Rubbing against a stone in this way is always invasive to a point, and can be intensely destructive to the rock surface, depending on its character.

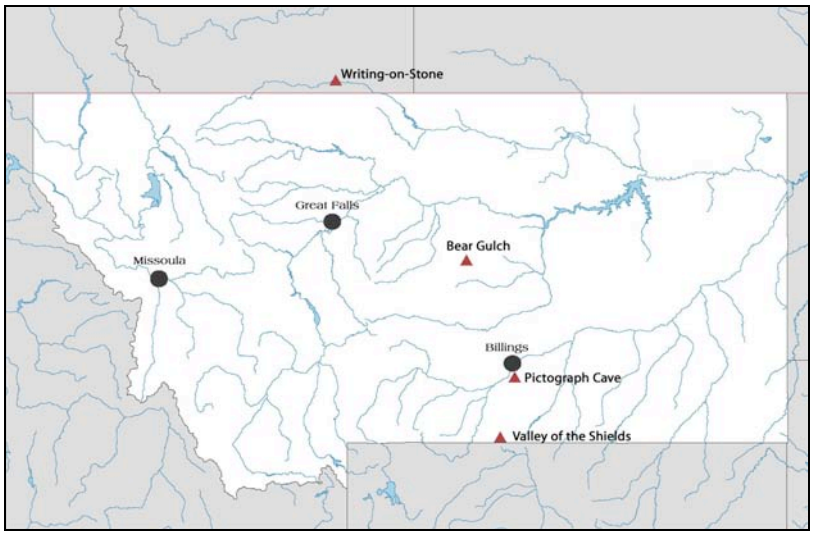
Literature on rock art recording shows numerous references to tracing. A Google search, of "rock art tracing" results in millions of hits. It appears that tracing is the primary rock art recording method known worldwide, and there are several projects where one may learn to trace. Information is included in most recording manuals and many how-to articles that describe tracing techniques and supplies. However, by 1998 tracing came under serious questioning because of spall damage from people touching panels, and a *no touching* campaign, which included plastic associated with tracing, was credited to conservation concerns and an attempt to preserve rock art. The *no touching* policy gained support because direct dating of rock art was developing, and it was discovered that human

contact can contaminate figures and preclude reliable dating in some cases. The no tracing policy quickly became the norm for managers producing tourist brochures on rock art, and it is the message in the American Rock Art Research Association Guide for Guides, which is an information pamphlet for non specialists guiding tourists to rock art sites. The attitude, "*never chalk, trace, or otherwise touch rock art*" is a common plea for inclusive non-impact. No group has adopted as clear an anti-tracing policy as the Nevada Rock Art Foundation. Their website stresses the cons of tracing and states that they regard "*tracing as destructive and therefore a completely unacceptable method of recording*." Our literature review concludes that there is no consensus on the topic, and views are often polarized. Most recent publications take the stance that tracing is sometimes beneficial but should be used with caution. However, most advocate that tracing should not be done as a recreational way of viewing rock art. Instead, it is a method of recording to be used by trained people for a specific purpose, since it is destructive to fragile rock surfaces.

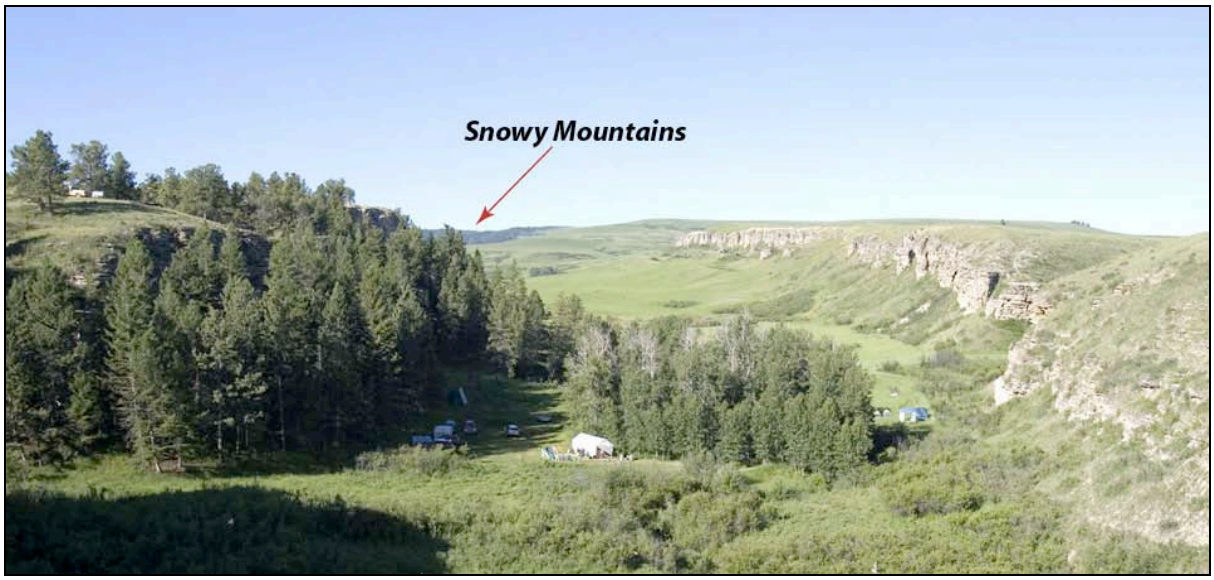


Instruction in rock art recording is available through training workshops, such as established long-term archeological society programs in Arizona, Texas, Nevada, and Oregon. Field schools and local archeological groups often have rock art components, as do Forest Service Passport in Time, Earthwatch, and similar participant programs

around the world. Volunteer projects led by established rock art recorders provide intensive experience in recording methods geared to individual sites and conditions.



The Bear Gulch project in central Montana included highly experienced recorders trained through formal workshops, students, and volunteers just learning the basics. The site is located in a canyon in the open pine breaks of the Snowy Mountain foothills.



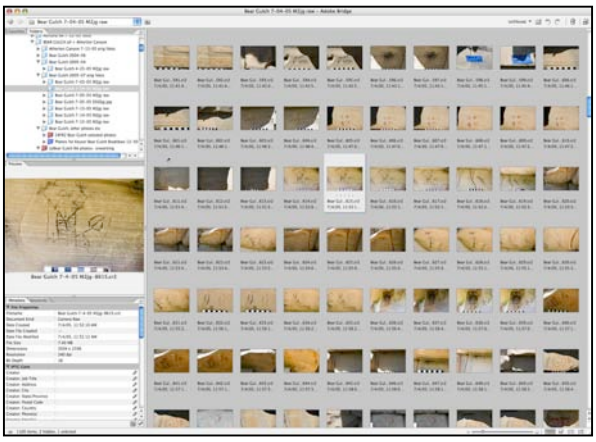
Layered cliffs are covered with hundreds of engravings and paintings. Shield-bearing warriors are the dominant motif, but also present are other styles of humans, some animals, various objects, and geometric shapes.

Recording in 2005 consisted of direct tracing of all figures and full coverage of the entire site with a professional digital camera and several support cameras. The field tracing process involved measuring a sheet of plastic and taping it over the panel such that no tape touched any rock art. Stippling was used for recording paintings, with dots closer together for darker paint and more widely dispersed for lighter areas. For incised images, the lines were traced.

The plastic sheet was labeled with the site number, recorder's name, date, wall letter, area locus number, panel number, and arrow showing up within the panel. After the panel was traced, individual figure measurements were recorded on a form along with additional notes. After recording was finished, all information was placed in a labeled envelope, which was checked for completeness and entered onto a master work list.

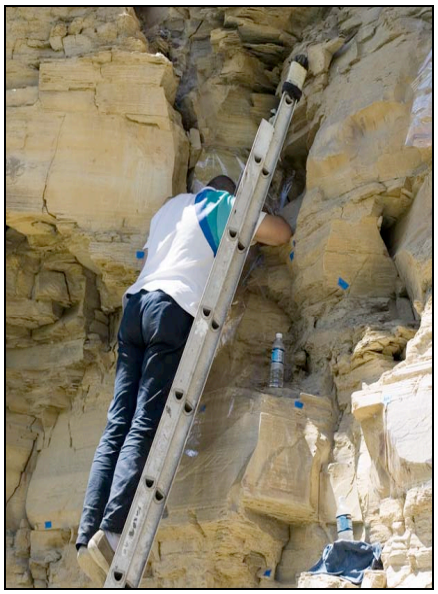
In the field the digital photographic process was much less complicated. High resolution photographs were taken of the site, panels, and component figures from different perspectives and with different settings. Photographs were saved in full resolution RAW format, an uncompressed,

unprocessed 16-bit data file that allows greatest color information and post-processing capability for detail extraction. A photo log, with additional notes, was done by digital voice recorder for later transcription.



Field time and field personnel for computer tracing are minimal compared with those needs for field tracing, but calculating time for field and office tasks is not a useful measure of comparison between the two tracing approaches. Both are time consuming, and even though field recording necessitates additional time in the office processing the drawings, computer photo tracing will result in even more extensive office time. Therefore, it depends on whether one wants to, or in some cases needs to, allocate more time to the field or more to the office when choosing a method based solely on time. More important considerations when making the tracing decision are impact and accuracy.

The decision to field trace must be based on evaluation of *impact to the site*. Tracing should not be done if it promotes spalling. Even if the wall or boulder is stable, such as smoothed basalt, wet weather can weaken rock, and tracing should be done only when dry. Sandstone can shed during rain or melting snow, and freezing and thawing of limestone are major causes of spalling. In most cases granite can withstand tracing, but fire damage to any rock may make it more fragile. Surfaces must be closely examined and evaluated prior to tracing, and sometimes one part of a site can be traced and not another. Minimal pressure should be placed on the wall regardless of surface stability to prevent spalling or marking the wall. It is important to use non-marking tape with controlled adhesive qualities, and as little as possible. Photographing rock art for computer tracing is non-impacting with a good camera and lenses, but impact is possible if one climbs on the rocks for a better view.



Recorder safety and comfort are important. The rock art must be safely accessible from ladders, steps, ledges, or ropes while maintaining balance and stability, and without impacting the site. These considerations pertain to field tracing and field photography. For tracing accuracy one cannot be preoccupied with temperature, weather conditions, cramped arms or legs, or fatigue. Other aspects affecting recording comfort — and thereby quality — are clouds, sun, glare, degree and intensity of shadows, rain, snow, heat, wind, dust, and bugs. These environmental concerns are minimized by digital photography and computer tracing, which limits outdoor exposure.

It is best to photograph all parts of a site, and at different times, regardless of what is visible on the wall at any given time of day or season. Some rock art is visible to the eye or the camera only in certain intensity or direction of light, and use of special reflectors, mirrors, or screens may be necessary. If something is overlooked in the field, it may be discernible during computer enhancement only if that portion of the wall has been photographed. Likewise, for tracing, it is desirable to leave recording equipment on the wall throughout the day, and return periodically —

during a day, or even better during different seasons — to search for overlooked lines and figures. In this regard, camera work is more versatile because it involves less planning, fewer people, and limited supplies to return to the field.

Recording accuracy is dependent upon observer subjectivity. It is often assumed that tracing is objective and accurate, but it relies on what the recorder interprets at the time, and thus is affected by eyesight, attention, imagination, and environmental conditions, such as light and shadow. There are variable degrees of tracing, and every peck, scrape, crack, and smear may be recorded — in which case a figure can become lost in the concentration of dots. Or just the largest and most obvious figures may be outlined — which may not properly or accurately convey the image. Thus, common sense and subjectivity cannot be eliminated, and the recorder must decide the best portrayal for available time and for the research design.

Deciding on what level of tracing to do is easier from a digital photo because the time constraints of the field are removed allowing the freedom to experiment with different levels. Powerful cameras and lenses now record more than the human eye can see, and processing software can bring out much detail, which can be aided by computer zoom features during computer tracing potentially increasing the accuracy over field recording.

The number of people needed, personnel training, and the amount of equipment each person needs is an important budgetary consideration between field and computer tracing. Quality and quantity of supplies influence recording accuracy for both methods. Tracing supplies, though relatively cheap, are variable and expendable, and

must be replenished. Photographic and computer equipment are expensive but are reusable. Although cameras and computers also are necessary for field tracing projects, it is possible to get by with less expensive equipment and fewer of these items than if the same number of people needed to be employed in computer tracing. Thus, overall expenses rise with higher technology if personnel needs remain the same for both methods.

Directly experiencing the rock art is often given as a benefit of field tracing over computer tracing. Field tracing may give insight into original production methods and relations between figures, or between figures and the wall or the site, that otherwise might be overlooked. Detailed tracing might also give insights into site taphonomy, or changes since the rock art was made.

Computer tracing, which is done away from the site, is best accomplished by any specialist proficient in the software and details of rock art extraction and processing. This can free the archeological recorder to concentrate on other aspects of the study, but it removes the personal contact with the site from the person tracing the figure. However, this may result in a more objective representation, and since the archeologist, who was at the site, will be doing the analysis the contextual perspective has not been completely lost.

A perceived benefit of field tracing is that photography cannot discern faded pictographs or faint petroglyphs as well as direct observation. This slide shows examples of the results of computer tracing of a faded image and of a fragile image. It also shows the options of keeping the photo behind the tracing or removing it.

After initial processing of either field or computer tracings, it is desirable to return to the site and compare the preliminary results with the original panels. The perceived accuracy of field tracings and digital tracings often allows researchers to feel justified in skipping this final step, which is more often than not hard to accomplish because of lack of money, time, or restricted access to the site. Final checking, however, should always be done when possible.

In conclusion, both direct field tracing and computer tracing of photos can result in accurate, full-scale duplication of rock art panels, but currently field tracing usually can accomplish this faster and thus at a lower cost. Volunteers can be taught field tracing without purchasing expensive cameras, computers, and imaging software, and the learning curve for field tracing is lower than specialized training in computers. This increases the potential for skilled volunteers in a shorter time frame. Both methods are time consuming, so when it is an advantage to have knowledgeable people functioning quickly because of time and budget concerns, field tracing is clearly justified. Although the technology exists today to replace field tracing with computer tracing, it is not yet feasible from an economic perspective.