Fire and Rock Art in the Helena National Forest

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Natural forest fires of 2000 burned hundreds of acres in the canyons of the Big Belt Mountains in the Helena National Forest of central Montana. These limestone canyons are the locations of several recorded rock art sites and have a high potential for more pictograph sites in unsurveyed areas. During 2001 we examined portions of selected canyons to assess the conditions of known rock art sites, locate and record new sites, and evaluate the impact of fires on these pictographs as part of a contract with the Helena National Forest administered by Carl Davis. The study area included canyons at the northwestern end of Canyon Ferry, a large reservoir on the upper end of the Missouri River, and canyons just downstream that drain into Hauser Lake, another Missouri River reservoir.

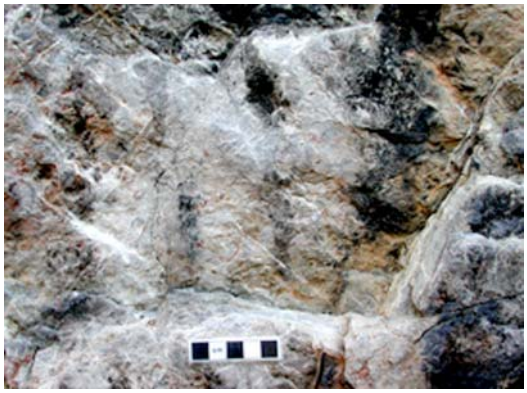
The effects of fire on rock art have been a concern to researchers and managers for some time, although literature on the topic is sparse and is more likely to be found buried in articles or reports focusing on a rock art site or region rather than directly dealing with this subject. However, in 2001 Roger Kelly and Dan McCarthy (Kelly and McCarthy 2001) published an article devoted to examining the impacts and effects of fire on rock art with examples from nine states that range from Kentucky to Hawaii and Colorado to Texas. This report on Montana adds another state to that list.

The Big Belt Mountains support outcroppings of Madison limestone, which is light gray to almost white in color and provides an ideal canvas for painting. The canyons of this study area are mostly winding and narrow with Magpie Gulch, the southernmost canyon examined, supporting a wider more open setting. In all cases limestone occurs in layers at various levels along the mountain side or as fins that extend all the way from the top to the bottom of the canyon. These kinds of formations include many flat walls, small rockshelters, and

numerous niches and caves, all of which are appropriate settings for rock art and some of which were used for pictographs. Although there are a few pictograph sites within this mountain range that are complex and were painted at more than one time, the majority of rock art sites in the Big Belts are small and probably single component.

Our 2001 study area included one previously recorded site, the Magpie Meadows Pictographs. This site was originally recorded by Sara Scott of the Helena National Forest in the fall of 2000 during a post-fire damage assessment of all cultural sites within burned areas. The site is located on a south facing limestone outcropping at the end of a fin in the Magpie Creek valley bottom. The pictographs at this site are typical of central Montana rock art, dominated by smears, fingerlines, and dots. The dot pattern shown to the left here is the most prominent figure at the site and resembles a stylized handprint with the dots at the finger tips, the joints, and along the outline of the hand. The handprint is another common figure in central Montana rock art.

Other figures at this site include a solid round disk painted in a slight smooth depression. The general appearance of this figure is also very much like a stylized hand. Numerous single finger dots also occur across this site, and some short vertical parallel fingerlines.



All dots appear to be fairly large marks made with the palm of the finger or with the thumb. All of these figures are of red liquid paint, but this site also has some black fingerlines, which are in a general area of black burned wall.

Fire surrounded the site, and no trees near it escaped being burned. The limestone gravel in front of the site was also burned and discolored by the fire, and ashy deposits cover the shelter floor. Although within the forest fire, the area of soot by the black fingerlines appears to be the result of a campfire built directly below the paintings and smoking the wall rather than a wild fire. This distinction is based on the observation that the soot is only on the lower part of the panel and

not the upper part, and the burned trees indicate the fire was not limited to ground level. However, this speculation cannot be confirmed without photos of the site before the forest fire, which are not available.

Across the creek and just slightly downstream is Magpie Window Shelter. This site is in a small rockshelter in the lower tier of limestone separated from the valley floor by a steep slope covered with scattered pines and junipers. Although many of the trees have burned on the valley floor and on the slopes above this shelter, the fire did not effect the site. The few paintings at this site are similar to those at the mouths of other nearby canyons, such as Avalanche, and are typical of central Montana rock art. The only anthropomorph in this shelter is a small fingerline stick figure with drooping arms, spread legs, and apparently no head. It resembles others in the Little Belt Mountains just to the northeast. Also at this site are several small black smears and a red smear.

Even higher above the Magpie Creek valley bottom is Field School Shelter. The small cave faces south and is on the steep hillside near the top of the canyon and at the base of a prominent discontinuous series of limestone reefs. The area previously was covered with trees and bushes but now is fairly clear due to fire. There is an excellent view from the cave, which overlooks the lower portion of Magpie Gulch and Canyon Ferry Reservoir.

The elongated cave has a small entrance room, which constricts rapidly into a small hole that projects back into the cliff face. The figures in this cave are mostly obtuse smears and fingerlines, which are not uncommon within caves of this type in the central Montana mountain ranges. Orange finger paintings are on top of the white calcium carbonate deposits that cover the overhanging sloping wall. There are three small fingerline figures that resemble turkey tracks or stylized anthropomorphs. Small pinkish and orange smears also occur here.

There was no impact to this site from the fire, although it surrounded the cave leaving behind many tree stumps and bare branches. The bush immediately in front of the cave survived the fire with very little impact, while the fencepost immediately on the west side of the cave was charred almost all the way through indicating that the fire was hot in the immediate site area but apparently moved rapidly across the landscape and did not enter the cave. This is also supported by the unburned cave floor deposits.

In Trout Creek canyon we recorded an unusual rock art site for central Montana and one that puzzles us regarding origin. The Crevasse Pictograph site is in the first tier of limestone above Trout Creek and consists of a long rockshelter with a small cave at the northeastern end. The overhang above the cave entrance is very slight and does not completely protect the entrance from the elements as evidenced by running paint on the red figure there. This large site is readily seen from the trail and obviously attracts many modern visitors as evidenced by a series of scratched engravings (including a small person with a hat or fancy hair style), charcoal initials, and some recent orange smears in the main lower part of the shelter.

The entrance to the small narrow cave is marked by a prominent red abstract figure (photo to left). Although abstract designs are characteristic of central Montana rock art, this figure is larger and messier than the typical central Montana abstract. However, it appears more aboriginal in style than modern or historic. The figure draws attention to the cave entrance, which is otherwise over shadowed by

the large rockshelter room to the west. The cave is an elongated karst crack, and most paintings are within six feet of the entrance. Just inside on the left wall there are at least five generally circular smears of very thick runny dark red liquid paint. These are in an area of considerable water seepage which has formed a travertine over the paint and caused some of it to run. These circular smears are on smoothed depressed areas on the rock wall.

On the right wall across from the smears is what appears to be an animal figure made of extremely thick, very runny, liquid red paint applied either by finger or daubed on with a piece of material. Both the smears and the possible animal are figures often portrayed in central Montana aboriginal pictographs and red liquid paint is the usual substance used for these representations, however, these are varied enough from the standard portrayals to make their origin questionable.

The enlarged crevasse goes back about 40 feet to a pit approximately 12 feet deep with a 10-foot ceiling. At the pit a large log has been driven into the wall apparently as a hand-hold devise and a smaller log was put into the pit presumably to assist climbing (see photo to left), although the entire passageway is easily climbable without them. Just past the pit, which we designated Name Pit because of the modern names there, are continuing solution cavities for approximately 12 feet before encountering another parallel pit, which probably extends 15 feet to join Name Pit. The total length of the cave is estimated at 65 feet. The only paintings in the cave interior are at Name Pit. The three names at Name Pit were dated 1985 and were done with red spray paint. The names include Casey Anderson, Chris Anderson, and Jeremy Anderson, apparently a single family. Below Jeremy's name is a small animal with antlers, presumably a deer. The animal appears to be contemporary with the names and sheds doubt on the entrance pictographs, although they are of a different style.

The entrance paint has many characteristics of aboriginal constituents, especially the thickness and runniness. The paint

does not look the same as the Anderson names in terms of texture, and nothing inside the cave or at Name Pit seems to equate with the entrance figures in style. However, given the brightness of the paint, figures that do not seem to fit the general prehistoric pattern for this region (although descriptively similar), and the red Anderson names, a possible relation between the entrance paint and names cannot be ruled out without a chemical paint analysis. No portion of this site was affected by the recent fires.

The Oregon Gulch Pictographs are in a narrow gates area in the canyon bottom low on the limestone wall, and immediately beside a trail that has probably traversed this gulch for many centuries. The site faces west, but much of the rock art is on a small south-facing notch, suggesting that the panel was meant to be viewed by people approaching the site from downstream.

All the paintings are in a light red to orangish red and dominated by smears and fingerlines. A series of five vertical fingerlines and at least two horizontal lines that appear to cut across the center of them are typical of the stylized bear track design common in central Montana.

The site has not been burned by the recent forest fires, but the impact from trail use and nature can be seen. The remains of a small campfire are at the base of the bluff and stashed firewood in small niches along the base indicate that people have camped and burned fires here probably for hundreds of years, which may explain why the remaining rock art is so limited. However, there is no soot present from recent campfires.

The site does not appear to have been subjected to much flooding, even though the limestone wall of this cliff is mostly covered with a mud like film typically seen in the Big Belt Mountains. The fractured nature of the limestone, undoubtedly from freezing and thawing, suggests there were more paintings here in the past.

The Big Log Pictograph site is on the west end of a wider opening within a narrow canyon and just at the mouth of a very narrow gates area where erosion has downcut through the limestone to form a walled drainage channel. Although the canyon widens at the site, it is still bordered on either side by limestone exposures.

The Big Log rockshelter is elevated above the drainage bottom and separated from it by a short steep vegetated slope. The site has not been recently affected by fire.

Like the other sites examined in this study area, the figures are typical of central Montana rock art. The main panel is on the right side of the shelter and includes a small group of two sets of three vertical fingerlines with an associated cross and an associated additional short fingerline. Also present at this site are two stick figures that resemble bird like anthropomorphs.

These figures are represented only by a single vertical line for the body. One figure has arms that are very slightly drooping (as shown in the photo on the left) while the other has arms that are very slightly raised. However, in both cases the arms essentially come straight out from the central vertical single line for the body. Neither figure has any indication of a head, other than a slight upward extension of the central line, and there are no indications of hands, legs, or feet.

Overall, the rock art in these limestone formations appears to have been minimally affected by the recent forest fires. In cases where the fires were surrounding the sites, it appears that the fast moving blazes prevented the sites from being harmed as extensively is as possible by slow-burning long-term campfires where concentrated heat and smoke result in blackening of the wall or ceiling. Additionally, overhangs that were protecting the paintings from other natural elements also apparently acted to protect the pictographs from fire damage. Our experience with fire and other limestone cave paintings in central Montana mirrors this scenario, whereby the paintings are only minimally affected by the fire itself.

However, a greater effect of the fire on the rock art in these central Montana canyons is their subsequent exposure after the fires have removed camouflaging vegetation. In many cases, as is graphically portrayed in the photo to the right, the once hidden from view site is now easily visible from the road and attacks more visitors than prior to the burn. Although the heat may result in accelerated spalling of the limestone, it probably

does not have any long term effect that can equate with seasonal freezing and thawing, which are extremely detrimental to the rock art sites of central Montana.

The best immediate protective measure is to continue searching for and recording rock art sites so that records exist prior to fires. Site recordings will enable better comparative studies of the before and after site conditions. Although there is information to be gained and lessons to be learned by studying how fire effects rock art sites in different environments, it is essential to conduct local and intra-regional long-range studies taking into account the effects of other climatic impacts on the specific geologic formation used for rock art in a homogeneous area in order to ascertain the best preventive coarse of action. For example, it has been suggested by Kelly and McCarthy (2001) in some areas it might be advantageous to reduce the amount of available fuel around a rock art site by hand in order to decrease the chance for intensive fire damage. This goes hand-in-hand with Alice Tratebas' suggestion that prehistoric fires may not have been as damaging to rock art in northeastern Wyoming because more frequent natural fires kept the fuel source around panels reduced compared to the build up that occurs today. However, before pursuing vegetation reduction as a rock art protective measure, this topic must be examined on a local level because what works in an area of sandstone formations may not be the best solution in an area of limestone mountains. It is possible that natural fires in the limestone canyons of central Montana were not much different prehistorically from what they are today. These canyons do not have excessive timber in or around the sites that were not affected by fires, and the sites within the burn zones indicate that the trees were not excessively dense. Thus, the vegetation may have been close to the aboriginal forested conditions. Therefore, it might be advantageous to keep the forest as camouflage for the site because any resulting fire damage would be less than the damage caused by constant visitation. In conclusion, the topic of rock art fire management for site protection presents an array of problems that need to be considered on many levels from local to world wide, but it is an area where solutions can be developed with study and cooperation between researchers.

Reference Cited.

Kelly, Roger and Daniel F. McCarthy
2001 Effects of Fire on Rock Art. In *American Indian Rock Art*, edited by S. M. Freers and A. Woody, pp. 169-176. Vol. 27. American Rock Art Research Association, Tucson.