

Valles Caldera Slowly Yielding Vision of Ancient Times

By: Dave Menicucci, Special to the Monitor

To most people the obsidian that litters the Valles Caldera National Preserve is merely an interesting geological feature. To Anastasia Steffen, the preserve's Cultural Resources Coordinator, each of these stone artifacts is a portal to the ancient past. With a limited staff and resources, Steffen and her team have slowly been collecting historical data from what she calls one of the most significant archeological locales in the world.

An astonishing image is emerging. Modern peoples are only the latest ones to be enamored by the preserve's bounty. "There are indications of significant human activity for at least 10,000 years," she said.

As these findings are assimilated into an historic vision of the past, the public's fascination has been piqued. "People want to know what happened in the past, how we got here, who was here before us, and how they lived," she said. The obsidian on the Valles Caldera can help to answer some of these questions. "There are few other remnants or remains of the very ancient inhabitants of the preserve," she explained. She likens the challenge to putting together a jigsaw puzzle picture when only a fraction of the pieces are available and where it is unclear whether pieces of other puzzles may be intermixed.

Obsidian is a naturally formed volcanic glass and is an extremely functional material for creating various utensils. When a flake of obsidian is broken off of a larger piece, it retains a very sharp edge. These flakes can be fashioned into cutting tools or weapons. In fact, obsidian flakes are so sharp that they are sometimes employed in modern surgical instruments, especially in scalpels used for eye surgery.

Much of the archeological work on the preserve is driven by the National Historical Preservation Act. The act requires all federal agencies to survey public land for historical remains and to determine the best methods to safeguard them prior to implement any improvements, such as constructing roads or building new structures. There are four steps in this process: Inventory the sites, evaluate them, assess the impact of proposed action on the site, and decide how to proceed.

At the preserve they are still immersed in the inventory process. "About 95% of our work relates to proposed actions, but only about 10% of the preserve has been inventoried," she remarked.

Much of the archeological team's survey work has focused on the preserve's roads because this is where most of the improvements are planned, many of them relating to income-generating activities. Ironically, roads contain much of the visible obsidian artifacts because the topsoil has been removed. So they are potentially valuable opportunities to identify historical sites, she reported.

The pace of the archeological work has created some frustrations among the staff. Jim Trout, a field worker at the preserve, stated that summer rains rendered the condition of some roads nearly impassable, threatening the fishing program. However, he understood that the staff was not to touch any part of the road. "We could not even take rocks from the roadside to fill holes in the tire tracks," he asserted.

Steffen has responded to these concerns by directing her resources appropriately. “We have assessed nearly all the roads,” she declared, and “two of the major north-south arteries, have been upgraded this year. Others are scheduled for upgrade soon.”

In spite of the load of pedantic activities, Steffen has cleverly managed to create a robust investigative endeavor on the preserve, one driven by scientific curiosity. By cultivating the allure of the preserve’s archeological resources as a haven for original research, she has attracted investigators from various labs and universities to conduct self-funded research on site. Naturally these researchers share their results with Steffen’s team.

As an expert on obsidian, Steffen is uniquely qualified to lead the archeological effort. Her doctoral thesis was centered on the effects of forest fires in the analysis of the debitage, or flakes resulting from the fashioning of obsidian tools. She and her team have collected data on thousands of debitage samples from the preserve and are now attempting to create a cogent, historical picture from them.

One of the most impressive recent findings is that obsidian artifacts—which are positively identified as originating from the preserve—have been found across the central US, some sites over 800 miles distant. Steffen believes that ancient people transported these tools great distances because they had value as weapons, utensils, or for barter.

There are complications to constructing a temporal record of ancient events on the preserve. Obsidian is the only record of the most ancient people. No other implements, such as wooden spears or other implements that might have been used in conjunction with the obsidian, have survived time’s journey. “We can only make educated guesses about how the artifacts were used,” she remarked.

Another obstacle is the difficulty in dating obsidian. One method is called obsidian hydration dating. Obsidian absorbs water slowly over time and the depth of this hydration layer can be an indicator of age. However, Steffen said that this method is not exact and nothing akin to the precision of carbon-14 dating. She explained that its real value is in determining the age of one piece of obsidian relative to others in the same locale. This can help place an artifact in the proper stratum of earth that is exposed in an excavation. Since the age of each stratum is generally known, the artifact can be approximately dated. Contrary to popular belief, artifacts are not fixed within the various strata of the earth. “Small burrowing animals dig into the soil and mix the contents of one stratum with another,” she said, a process called bioturbation.

Sometimes an artifact can be dated based on its shape and markings resulting from its development. “Obsidian tools have characteristics—shape, size and other markings—that can help us to identify the era in which they are created,” she explained. But it is not an exact science.

As the archeological work on the Valles Caldera progresses ancient time is coming into focus. And the obsidian that lies in abundance throughout the preserve has become the viewing lens.

More detailed information about the archeology work at the Valles Caldera can be found in the Valles Caldera’s draft *State of the Preserve*, released in September:

http://www.vallescaldera.gov/about/trust/docs/trust_SOPDraftSeptember2007.pdf