

Landward Fdn funds restoration of Tsopki Ruin. Below is the related article that was published in the Flagstaff Business News:

Outdoor Classroom for NAU Archaeologists' 3D Pueblo Imaging

by **FBN** on November 2, 2015 in **Business**



A prehistoric Sinaguan pueblo on Babbitt Ranches is being documented with three-dimensional imaging technology and stabilized to preserve its standing walls. Tsopki, or antelope house, is also serving as a hands-on learning station for Northern Arizona University archaeology students. The multi-storied building is just outside Wupatki National Monument near the Little Colorado River. “Places like this are

scientifically interesting, but they are also incredibly culturally meaningful,” explained archaeologist Chris Downum, an NAU professor heading up the documentation and preservation project.

To get to the site, archaeologists and students descend a sandstone cliff face and carry in everything they need, including gallons of water for stabilization work.

“One of the things that has happened to this particular pueblo site is a considerable amount of the mud mortar that people applied to the walls 900 years ago has washed away and eroded, leaving some holes and some voids in what we call the original fabric of the pueblo. So our students were able to mix some mud and use a particular glue-like substance that makes the mud a little more resistant to weathering to protect the walls,” said Downum.

The researchers also carry in cameras to create a virtual model of the structure.

“We have a new way of recording archaeological sites that’s known as terrestrial photogrammetry. It involves taking high resolution overlapping digital images of these prehistoric sites and then using a computer program to stitch those together into a precise three-dimensional model that is rich with all the detail of the digital photographs but also

scalable and measurable in terms of precise documentation of the form, the outline and the condition of the place at the time it was photographed,” said Downum.

The program creates an image of the pueblo that can be rotated and viewed from different angles. “You can go inside it. You can look down on it, you can make a traditional two-dimensional plan view map, you can make what are called elevation views by looking straight at the site. It’s all correct and to scale,” he said. “The pictures are so vivid and so clear, and the three-dimensional aspect of it really does make you feel like you’re there.”

Downum says the photography shows individual artifacts that are lying on the ground and also the plants in the area. “We’ll be able to create a permanent record of very high resolution and detail to look at what kind of vegetation was growing at the site. So when the environment changes, we’ll be able to go back and do plant inventories and other things that will show up on there.”

With the terrestrial photogrammetry, the team can examine the ruin on a computer screen. They can see where Tsopki’s stone and mud walls are crumbling, where water can be rerouted to slow erosion, and they can estimate the amount of materials they need to work on the site.

“It’s a real aid to our planning and our execution of the stabilization process,” said Downum.

In the past, Tsopki, which also includes a kiva-like structure, has been managed as part of Wupatki National Monument. But when the National Park Service reevaluated the monument’s boundaries last year, it learned the pueblo was actually on Babbitt Ranches. Downum says that discovery has resulted in a cooperative effort to preserve the ruin.

“We have never attempted anything like this before, which involves Northern Arizona University and the Babbitt Ranches with the cooperation of the National Park Service to begin a new chapter in the management of the cultural resources out on the Babbitt ranch, which we hope expands and grows into a more comprehensive program.”

Pueblos like Tsopki are considered iconic structures of the ancient past that imbed a tremendous amount of information for archaeologists, but they are also incredibly meaningful for the Native descendants of the ancient people who lived there, says Downum. His research reveals that the Sinagua, who inhabited the pueblo, were master gardeners. They farmed crops such as corn, maize and squash in the arid, high desert environment. Pinyon nuts and some of the pottery shards found at the site suggest they traded with neighboring cultures.

“The Hopis would say these places represent the footprints of the ancestors, that they’re the tangible traces of the tangled paths of migration that were walked by their ancestors. Each one of these ancient places is a piece of their story and we want to keep these places standing as remnants and reminders of the past.”

Downum’s long-term vision includes restoring historic buildings on Babbitt Ranches to use as a base camp for researchers. He also hopes to implement an archaeology program at Tsopki for individuals with cognitive disabilities to gain field experience and employment opportunities.

“What a great field station and what a great place to go and be allowed to go out there and train students and do research and just get some hands-on activities. We’re going to continue with this in years to come because these are just golden opportunities for our students to get hands-on training that is meaningful. This isn’t classroom training, this isn’t theoretical, this is the real thing and this is really contributing to the public good of preservation.”

Downum has worked with Babbitt Ranches for some 25 years in the conservation of cultural resource sites.

“I want to say how tremendous it’s been to work with the Babbitt Ranches. They are terrific. Babbitt Ranches has given us at NAU full access and helped us financially by providing materials and helping to pay for transportation. They are just amazingly helpful, easy to work with, accommodating and encouraging. Generations of students have benefited from the generosity of the ranch.” FBN