

ALL POINTS BULLETIN



Colorado Archaeological Society-Denver Chapter

...in the future, as in the past, the gathering of information will depend to a great extent on cooperation between avocational and professional archaeologists. ~ H.M. Wormington, 1978

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Cherokee Ranch: A Summary of Surveys

By Kayla Bellipanni & Caitlin Calvert

ABSTRACT Since 2014, Metropolitan State University of Denver has been fortunate enough to collaborate with the Cherokee Ranch and Castle Foundation in Sedalia, Colorado. During the surveys and the excavation of the Cherokee Mountain Rock Shelter (5DA1001), well over 1,000 artifacts have been recorded, providing a unique and very exclusive view of Douglas County's prehistory. This is evidenced primarily in lithics that date back to the Archaic and Late Prehistoric Periods, while three 19th century homesteads and manufactured iron artifacts such as a horseshoe and barbed wire preserve the more recent history. By examining the raw material type found at each site, we believe there is enough evidence to show that the area was occupied in short but frequent stages. It provides numerous advantages for shelter and hunting, a nearby permanent water source, and the plethora of tools and debitage sourced primarily from the most easily accessible lithic material on each side of Cherokee Mountain.

Introduction and Background

The sites and excavations discussed in this publication are the work of Metropolitan State University of Denver's Archaeological Field Research classes, under the supervision and instruction of Dr. Jonathan Kent and Mr. Reid Farmer. Cherokee Ranch is situated just north of Highway 85 in Sedalia, Colorado, and encompasses many sites that the university's students have had the privilege of being some of the first to research and survey. Hills and mesas flank each side of the Cherokee Mountain's paleo-valley. The Castle Rock conglomerate, which has large inclusions containing material from as far away as Coal Creek Canyon in west Boulder, tops Cherokee Mountain in a substantial layer. There is also a sizable layer of rhyolite, part of the Wall Mountain Tuff, and an ancient riverbank and

bed that carried trees down, eventually contributing to a marked deposition of petrified wood in the area. To the south of Cherokee Mountain is East and West Plum Creek, the only year-round water source until North Monument Creek, 22 miles south. Various prairie grasses, yucca, prickly pear, wild mustard, and prickly poppy make up most vegetation, broken up by dense groups of scrub oak and occasional coniferous trees dot the landscape.

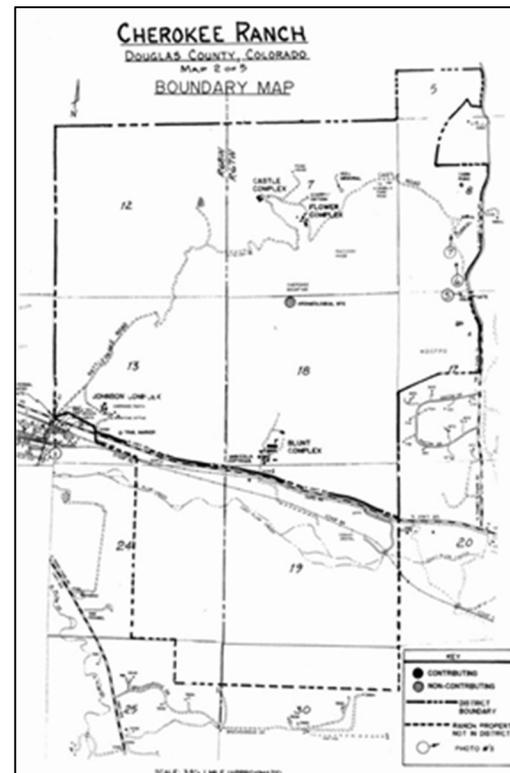


Figure 1 Boundary Outline of Cherokee Ranch

The rugged terrain has a long history of occupation, starting in 1862 (Blunt, 1862) and ending with Mildred Montague

Genevieve Kimball. Better known as "Tweet," Kimball purchased the land from the families that had previously occupied the area, combining them and calling her new acquisition "Cherokee Ranch" in honor of the tribes that lived in her native Tennessee (Figure 1). In love with what she called her "Summer Pasture," Tweet helped create the Cherokee Ranch and Castle Foundation to protect her land. There is a Conservation Easement on the land solidifying the property as a preserve to protect its agricultural and historical heritage (Cherokee Ranch and Castle [CRC], n.d.).

While Tweet made efforts to preserve the historic elements of the property, the evidence of prehistoric activity on the land survives primarily in lithics. Excavations performed on the terrace below Cherokee Mountain Rock Shelter (5DA1001) have yielded bones from hunted animals, possibly cooked in a fire pit or hearth. Several deflated hearths have been identified in the survey boundary, including one at 5DA1001, one on the terrace below the rock shelter, and potentially two on the Soderquist 2 site (see below).

The Cherokee Mountain Rock Shelter, created by natural weathering and erosion of the Castle Rock conglomerate, was extensively excavated in 1971 by Bruce Nelson and Charles Stewart. Their excavation yielded many worked stone tools, a hearth, and poor-quality bone fragments, likely from deer, elk, or bison. Four pottery sherds were also collected: one from the rim and three from the body. Nelson and Stewart concluded that Late Prehistoric- between 1250 and 1590 CE- occupation was reflected in the artifacts (Nelson & Stewart, 1973). Surface surveys have yielded few artifacts that can be accurately dated but have brought forth several projectile points of varying styles and one sherd of Taos black-on-white pottery estimated to be from 950-1250 CE.

Analysis

Over the six years at Cherokee Ranch, Metropolitan State University of Denver has identified twenty-three sites, fourteen of which are located on the south side of the property and the remaining nine on the property's central-north area (Figure 2). The primary method to locate these sites was pedestrian surveys performed by students overseen by the instructors, advanced students, and visiting professionals. Depending on the time of year and location, ground visibility varies. As this area remains a working ranch, it is essential to consider human and animal factors, such as damage from grazing cattle, human interference, and various environmental factors such as erosion and washout.

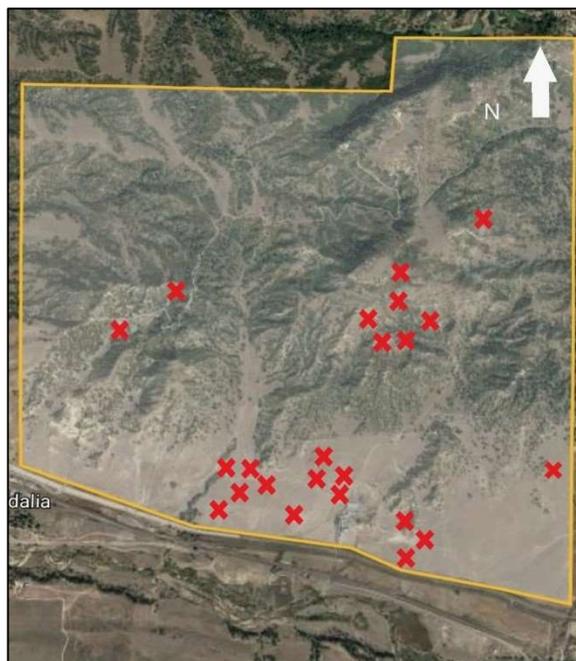


Figure 2 Overview of MSU Denver Sites at Cherokee Ranch

The concentration of each material varies from site to site, but overwhelmingly, we have found that the north side of the property shows a preference for rhyolite while the southern fourteen sites show a preference for petrified wood. In 2019, a large rhyolite scatter was discovered on the northeastern-most site, Raccoon Knob. The scatter was later found to be a prehistoric rhyolite quarry and working site. In all, over 1,000 artifacts have been recovered and recorded at Cherokee Ranch. Four hundred fifty-four of these artifacts were created from rhyolite, three hundred sixty were made from petrified wood, and the remaining one hundred eighty-six artifacts were created from other lithic materials like quartzite, quartz, sandstone, or chalcedony. Much of this material would have been locally available, rhyolite from the Wall Mountain Tuff, and many stones would have been available from the Castlerock Conglomerate, which tops Cherokee Mountain and all other mesas on the property (Koch et al., 2018).

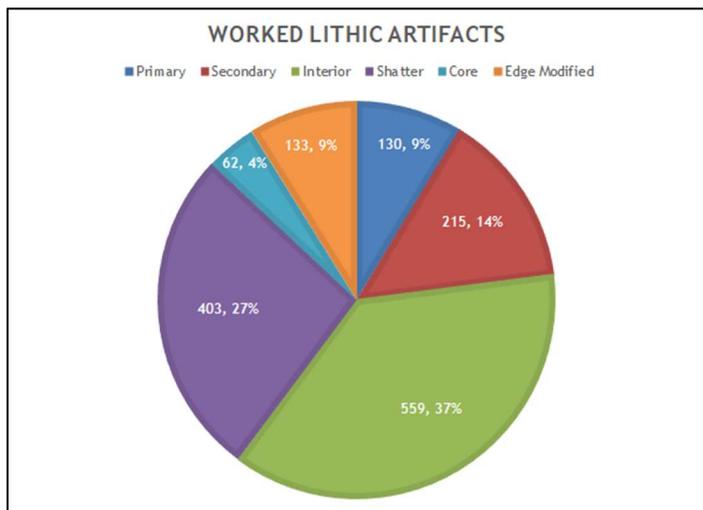


Figure 3 Petrified wood point. Summer 2020.

The majority of the sites have a relatively small number of artifacts and debitage. The average number of artifacts found comes out to 20.5 when all twenty-four sites are totaled, with all but three sites producing under 100 artifacts. The sites above that number include the rhyolite quarry, a lithic workshop, and the area directly above Cherokee Mountain Rock Shelter, which contains a significant rhyolite scatter. This low median number further indicates frequent but short-term habitation of the land in this area. Additionally, given that the overwhelming majority of sites located have been surface sites, further excavation and survey would likely find many more sites under the surface. The overall evidence across all sites indicates the creation of tool pre-forms rather than tool creation or maintenance (see the graph above). This attestation may be due to erosion rather than a true reflection of activity, as most of the data has come from surface surveys and pieces of shatter. To us, this may indicate that more intricate works would be harder to find or may have been removed from the surface due to weathering. Excavation, in particular, would likely produce in situ artifacts and possibly organic material and remains, something the open lithic sites cannot provide, giving a more holistic and valuable context for the high number of sites in the area.

An important area of note is Soderquist 2, a surface site that shows evidence of a lithic workshop and has two collapsed hearths sitting on the surface. The Soderquist 2 site has yet to be excavated, though plans to excavate seem to be in the near future. First inventoried in 2016, the site contained 720 artifacts, including debitage, projectile points (Figure 3), scrapers, awls, and a Taos black-on-white painted sherd (Farmer et al., 2017). Further investigation into this site could inform whether the high volume of artifacts was produced from a single habitation and what other activities were possibly occurring.

Conclusion

Located in the Cherokee Mountain paleo-valley and running along the permanent water source (East Plum Creek), Cherokee Mountain and its associated plains seem like they would have been an attractive place to stop and rest. While a majority of the information here has been inferred from surface surveys, the general pattern gleaned from the university's finds and excavation indicates little more than frequent- but temporary- occupation of the area. The high amounts of interior flakes indicate a transition phase in lithic manufacturing. For now, we can only piece together the parts of the story that were left behind in stone. Additional organic remains seem unlikely to be located. However, the presence of bone found in association with some of the hearths supports the idea of Douglas County's prehistoric individuals camping and hunting as they moved through the area, making use of whichever material was most readily available on each side of the mountain. Site by site, Metropolitan State University of Denver's work is undoubtedly helping to fill in the picture of the prehistoric people, as well as the historic families, that have lived in and built Colorado.

References

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Getting Involved: Classes, Lectures, and Other Opportunities

The 2021 Annual CAS Conference and Member Meeting

The CAS Chipeta Chapter in Montrose will be hosting the 2021 Annual Conference and Member Meeting on October 8-10, 2021. Please check the website of the [Colorado Archaeological Society](#) or the [Chipeta Chapter](#) website later this Spring for more details.

PAAC Classes for Spring 2021

The Program for Avocational Archaeological Certification has published their schedule of classes and events for Spring 2021. Highlights include Archaeological Laboratory and Site Survey Techniques and Prehistoric Ceramic Description and Analysis. See the schedule at [History Colorado](#).

SAA 2021 Online Archaeology Week

Join SAA for a celebration of archaeology! Online Archaeology Week will run from April 5 to April 9, 2021, the week before the SAA 86th Annual Meeting Online. All members of the public are invited to explore archaeology and history through downloadable activities and talks from archaeologists and other related experts. All activities will be free and do not require an annual meeting registration. For questions, please contact public_edu@saa.org. Additional information can be found on the website of the [Society for American Archaeology](#).

Archaeology in the News

Prehistoric Bone Etchings Believed to Be Among the Oldest Evidence of Human Use of Symbols

<https://phys.org/news/2021-02-prehistoric-bone-etchings-believed-oldest.html>

A recent discovery by archeologists from the Hebrew University and the University of Haifa alongside a team from the Le Centre National de la Recherche Scientifique in France have uncovered evidence of what may be the earliest-known use of symbols. The symbols were found on a bone fragment in the Ramle region in central Israel and are believed to be approximately 120,000 years old.

'The Dig' Review: Carey Mulligan and Ralph Fiennes on a Treasure Hunt

<https://www.nytimes.com/2021/01/28/movies/the-dig-review.html>

A small team makes a groundbreaking discovery in this fictionalized account of an actual archaeological expedition close to home

Archaeologists Express the Challenges of Studying Native American Artifacts After Items Were Stolen

<https://www.kltv.com/2021/03/09/archaeologists-express-challenges-studying-native-american-artifacts-after-items-were-stolen/>

After two men pleaded guilty to stealing Native American artifacts from the Cross Bar Management area, archaeologists say it will be hard to try and reconstruct the context of the historical site.

CAS Denver Chapter General Meeting Notes

DC-CAS JANUARY 18, 2021 GENERAL MEETING MINUTES

The DC-CAS January 18, 2021 General Meeting was scheduled to be held online at 7:00 pm via the Zoom platform. The guest speaker was Dr. James R. Allison (Brigham Young University). The title of his presentation was, *“Architecture, Site Layout and Community Organization in the Greater Southwest”*. Due to unforeseen technological interference, the presentation was not able to take place. Jon Kent was to consult with Dr. Allison to determine an alternate date for the talk.

DC-CAS FEBRUARY 8, 2021 GENERAL MEETING MINUTES

The February DC-CAS General Meeting was held online on Monday, February 1, 2021 at 7:00 pm via the Zoom platform. Jon Kent welcomed everyone and turned the meeting over to Lynn Hoy. Lynn announced the launch of the Chapter's new website and encouraged everyone to check it out. Next, Jon Kent noted that Dr. Christopher Roos (Southern Methodist University) would be the guest speaker for the upcoming March 8th General Meeting. The title of his talk will be, *Native American Fire Management at an Ancient Wildland-Urban Interface in the Southwest U.S.*

Jon Kent introduced the evening's guest speaker, Edward R. Henry, Assistant Professor in the Anthropology Department at Colorado State University – Fort Collins (CSU-Ft. Collins). Ed also serves as founder and director of the CRAG (Center for Research in Archaeogeophysics and Geoarchaeology) at CSU-Ft. Collins. His research interests pertain to the interaction of pre-contact Native Americans with their environment, how these small-scale societies were shaped by the landscape and how they, in-turn, shaped their surroundings. Focusing primarily upon eastern North American groups, Ed examines and ascertains such interactions using methods from geophysics, geoarchaeology and chronological modelling. The title of his presentation was, *Ritual Dispositions, Adena and Hopewell Enclosures, and the Passing of Time: A Monumental Biography of a Small Middle Woodland Enclosure in Central Kentucky, U.S.A.* The focus of his presentation was the Winchester Farm Enclosure Site which was occupied during a transition period (around B.C. 80). The site is part of the larger, well-known Mt. Horeb Earthwork Complex near the north Elkhorn River in Fayette County, Central Kentucky.

Ed began his talk by providing some background on the theory of itinerant biographies in the past in which an object's biography and a site's biography may change over time. Rooted in the works of cultural anthropologist Igor Kopytoff (University of Pennsylvania), things or objects are

seen to have value which changes over time. These things or objects are made, used, and moved. Their function and meaning can change over time. Eventually, these things or objects die and decompose. To apply this approach in archaeology, researchers can examine how artifacts or sites are created and used differently through time, and how they are discarded or abandoned. However, what is of interest is how people exist with these artifacts or sites, the decisions they make, and their attitudes toward artifacts or sites from the past. In an effort to avoid a linear, life-cycle approach to examining artifacts or sites, archaeologists can apply a more dynamic, social approach to trace movements of things or objects and people within fields of social action over time. By doing so, it can allow archaeologists to move between short-term and long-term time scales and to create meaningful biographies.¹

With respect to cultural history, people moved upland into Northeastern United States after the Lower Mississippi Valley had suffered major flooding and erratic climate change. Between 500 BC and AD 250, there was the first-time appearance of burial mounds and geometric enclosures. Around the time of the BC-AD transition period (200 BC to AD 500), there was an explosion of social and ceremonial activity which involved most of the North American continent. Such a wide-spread connection between groups within the continent had not been seen prior to this period nor afterwards during the post-contact period. In central Ohio, the construction of large geometric monuments appears and may incorporate different forms and may include parallel causeways. The construction of smaller circular enclosures was still important and they are incorporated into the larger groups. During this time, a large number of varied materials are coming into the Ohio Valley such obsidian, chert, silver and grizzly teeth from the west, copper from the north, shark teeth from the east, quartz and marine shell from the south, mica from the southeast, and galena from nearby to the southwest. Much of these materials are not traded back out of the valley, but are found deposited in large elaborate burial mounds.

Small geometric enclosures, which are the focus of this presentation, were created by a group of people digging a ditch in a geometric form and moving the dirt to the exterior. This created an embankment with a central interior platform surrounded by a wooden post enclosure. The interior platform was used for feasting activities and the burial of ceremonial items. Later, after a long use as a ceremonial site, the enclosure may be used as a burial mound. One form of small geometric enclosures are known as a *squircle*, a square enclosure with rounded corners. This form of enclosure is relatively unknown outside of the Ohio Valley. However, *squircle* enclosures have been found at the Garden Creek Site in North Carolina and at the Johnston Site in the Pinson Mound State Park in Tennessee. The Winchester Farm Enclosure Site is part of the Mt. Horeb

Complex which also includes the Peter Village Site and Mt. Horeb Site. The Winchester Farm Enclosure Site is located on the Winchester Farm, a thoroughbred horse farm. To the southwest is the Peter Village Site, a possible domestic site for the builders of the mounds and other ceremonial sites in the area. To the northeast is the Mt. Horeb site, a small mound park owned by the University of Kentucky. The Mt. Horeb Complex was first mapped in 1820 by C. Rafinesque, a French naturalist. In 1985, Dick Jefferies and George Milner (both formerly of the University of Kentucky) produced the first wireframe topo map of the Winchester Farm Enclosure Site. The map showed a circular embankment surrounding a ditch with a slight rise in the center of the circle.

As part of his research, Ed undertook a geophysical survey of the Winchester Farm Enclosure Site. Gradiometer results clearly showed a ditch and an embankment with a *squircle* shape. Conductivity results from the embankment determined there was ground moisture indicative of mostly clay soils. Magnetic susceptibility analysis showed the ditch to have a high degree of magnetism and the presence of an internal rise in the middle of the enclosure. Test excavations were undertaken which included one sixteen-meter by one-meter trench, two one-meter by two-meter units and one fourteen-meter-square block. The sixteen-meter by one-meter trench was placed so as to cut through the embankment, the ditch, and into the internal platform. A soil sample was taken from a soil column within the embankment. Analysis of the embankment soils showed that the enclosure had been built on the edge of a natural terrace. The embankment's fill was a homogeneous distributed sediment soil which indicated the soils were intentionally mixed rather than laid down in sequential layers. The buried ground surface under the embankment showed evidence of burning prior to the construction of the enclosure. The soil sample from a soil column from the center of the ditch indicated the ditch had been originally excavated down to bedrock. There was no clear evidence that the ditch had filled naturally. The ditch fill was made up of erratic, mixed and varied material which is not seen in naturally forming ditch fill. Geoarch analysis indicated that parts of the embankment were likely broken off, tossed into the ditch and burned. Post holes were encountered, while excavating the trench into the platform area. Therefore, two one-meter by two-meter units were placed in this area staggered to one another. Excavations revealed that a series of post holes had been placed in a pattern of smaller posts interspersed between larger posts. One post hole contained plain Adena pottery sherds which may have been used as chinking as the post was placed in the hole. It also appeared that the posts had been removed, and there was no evidence they had been burned. As the nearby Mt. Horeb Site had a clearly defined interior wooden enclosure without an opening, it was decided to re-examine the magnetometer data to see if the interior wooden enclosure within the Winchester Farm Enclosure had a similar construction. By enhancing the data contrast, it was possible to see finer shading of the area and ascertain the

wooden enclosure within the Winchester Farm Enclosure did not have an opening either.

Excavations of the internal platform within the trench revealed an ovular shape containing midden-like material and a cluster of burnt limestone. It was within this ovular shape that most of the site's artifacts were found. The artifacts recovered were common local Adena pottery, the end of a celt, a fragment of a slate pipe, a quartz crystal, fragments of local Galena (one of which was cut open), Wright check-stamped pottery fragments from the Middle Tennessee River Valley, and Kanawah chert from central West Virginia. Other artifacts found outside of this area were two tear-drop pendants of micaceous schist probably from the Appalachian Mountains (southwestern Virginia or western North Carolina). The pendants were recovered from the ditch and were believed to be unintentional inclusions during Middle Woodland use of the site. Based upon the known distribution of *squircle* enclosures and the recovered artifacts, it is thought that there was a connectedness of shared beliefs, ideas and ceremonial practices. Also recovered within the ovular shape were a variety of faunal remains consisting primarily of mammals as well as a few reptile and bird species. All of the remains came from animals commonly found in the area. Much of the faunal remains were burned (19.0%) or calcined (51.9%) with a small portion unburned (29.1%). It was thought the presence of animal bones represented a gathering of people for low-level feasting or food-sharing consumption. Interestingly, it was noted that all of the recovered animal remains are representative of the totem animals of Shawnee Nation clans. Although Ed noted that the Shawnee are later in time, there was a possibility of a connection to later groups. Based upon the Continuum of Social Food Consumption postulated by Megan C. Kassabaum², the Winchester Farm Enclosure Site falls into a cooperative collective/domestic consumption category characterized by a small group size and low competition.

Radiocarbon dates were obtained from several samples recovered from under the embankment, the ditch fill, and interior features such as the posts and midden. As a whole, the samples produced a wide-ranging occupation of cal 750 BC–AD 1020, approximately 1,770 years of site use. Next, Ed considered the locations from which the carbon samples were obtained and applied the Bayesian Chronological Modelling statistical method³ to his analysis. This method enabled him to produce a more intimate, dynamic chronology for the Winchester Farm Enclosure Site. Analysis showed a pre-enclosure use of the site's interior started at 20 BC–AD 30 and ended 200 BC–AD 120. Construction of the enclosure occurred AD 75–AD 200. Use of the interior space continued from AD 125 to AD 535. This would seem to suggest that the enclosure was not necessarily built specifically to use in ceremonial activities, but rather to contain the material evidence of past ceremonial gatherings. This idea is echoed by the presence of the interior wooden enclosure without an entrance. Date ranges for the ditch fill span 675 years which suggested there was intentional maintenance conducted on the ditch to

maintain the site's sacredness. The ditch was then refilled sometime during a 40-year period (started AD 845-AD 955 and ended AD 890-AD 955) and may indicate the site's use and/or importance had changed. The intentional filling-in of the ditch effectively erased the site from the landscape. Ethnographically, it is important amongst Native Americans to maintain a barrier between humans and spirits. For example, the Cherokee would burn or surround with water a home which was no longer in use. In addition to the interior post enclosure, the ditch at the Winchester Farm Enclosure Site was likely filled with water as it had been dug down to the bedrock. As such, it is useful to consider the modelling of keeping something in or out.

Ed concluded his talk by noting that not only was the Winchester Farm Enclosure Site part of the larger Adena/Hopewell social movement in the Eastern Woodland area, it was also part of more local, regional ceremonial practices. People had a long connection to the site and, even though it was no longer visible on the landscape, it still had an effect on how the land is approached, used and viewed today. At the end of his presentation, Ed took several questions from the audience. Jon Kent thanked him for an excellent talk.

1. To learn more about the use of this theoretical approach in archaeology, please see the works of Roberta Gilcrest (University of Reading), Chris Gosden (Pitts River Museum, University of Oxford), Cornelius Holtorf (Institute of Archaeology, University of Lind, Sweden), Wendy Ashmore (University of California, Riverside), and Rosemary Joyce (University of California, Berkeley).

2. Kassabaum, M. (2019). A Method for Conceptualizing and Classifying Feastings: Interpreting Communal Consumption in the Archaeological Record. *American Antiquity*, 84(4), 610-631. doi:10.1017/aaq.2019.47

3. To learn more about the use of this statistical method in archaeology, please see Buck Caitlin E. and Miguel Juarez, University of Sheffield, England (2017). Bayesian radiocarbon modelling for beginners. *arXiv:1704.07141v1 [stat.AP] 24Apr2017*. Available online at <https://arxiv.org/pdf/1704.07141.pdf>

The meeting adjourned at 8:35 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS.

DC-CAS MARCH 8, 2021 GENERAL MEETING MINUTES

The March DC-CAS Meeting was held online on March 8, 2021 at 7:00 pm via the Zoom platform. Lynn Hoy opened the meeting by welcoming everyone and noting that the evening's presentation would be of great interest given the number of fires Colorado had experienced this past year. Linda Sand reminded everyone that the CCPA Annual Meeting would be held on Thursday, March 11th and Friday, March 12th. She noted that it may still be possible to sign up for the meeting by going to the CCPA website. The meeting was then turned over to Craig Dengel.

Craig Dengel introduced the evening's guest speaker, Dr. Christopher I. Roos, an environmental archaeologist and Professor of Anthropology at South Methodist University. The title of Dr. Roos' presentation was, Native American Fire Management at an Ancient Wildland-Urban Interface in the

Southwest U.S." which summarizes his recent work with the Jemez Fire and Humans in Resilient Ecosystems (FHiRE) Project team. In an effort to understand the interaction between prehistoric peoples and their environment with respect to the outbreak of fires, the multidisciplinary research team examined the land use by the ancestors of the Jemez Pueblo in northern New Mexico (the ancestral Hemish) over a 500-year period. The results of their research provide a dynamic view of human effects upon the land which could provide a roadmap to improve present-day fire management techniques.

Roos began his presentation by discussing the current interest in fire issues in archaeology. In part, archaeological interest has increased due to fire outbreaks experienced worldwide and their connection to climate change. In this way, archaeology is made to be pertinent in examining and addressing today's climate issues and problems. Major fires are a global problem which have increased with time. Today, fires are more devastating resulting in higher loss of human life and economic loss to communities as settlements encroach upon wild spaces. Roos listed a number of recent major fires which occurred in the United States such as Colorado (2020), California (2017, 2018 and 2020), the Great Smokey Mountains in Tennessee (2016) and Texas (2011). He also noted the devastating fires on the Iberian Peninsula in Spain (2017). Roos stated that it would be naïve to think that current climate problems are unique to today's societies. As such, it would be useful to examine how prehistoric peoples interacted with their environments and the degree to which fire affected these communities. While many archaeological studies are interested in the effects of fire on humans, Roos is interested in how people and their actions relate to the intensity of fires.

The focus of the FHiRE study was the Ponderosa Pine forests in the Southwest. Historically, these forests were healthy when trees were widely-spaced, the canopy was high, and the soil underneath was rich in organic matter. The best-known fire regime was one where there was a regular pattern of fires in an area. Evidence indicated that the area experienced lots of fire. Trees would be burnt, but not be severely burnt so as to kill the trees. Tree ring analysis enabled a precise view by year and growing season to within one to two years. The results indicated that there were fires every three to five years during which flames would travel along the ground surface, but the canopy would survive. There also appeared to be a strong relationship between fires and whether the climate was dry or wet. This relationship was closely tied to the occurrence of the weather phenomena, El Niño and La Niña. In contrast, fires today tend to travel into the forest canopy and kill the trees. Young trees compete with established trees for moisture. As the young trees grow closer to larger trees, they create a ladder for fires to travel upwards and reach the canopy. If there are not enough trees which survive a fire to provide seeds, the area will become scrubland. With increased changes in climate, there an increase of fires. This increase in fires changes the structure of fires. Current fire-management practices attempt to prevent fires from

occurring. However, fire is needed to maintain the resiliency of a forest. Studies have shown that when forested areas experience moist periods mixed with dry periods and fire, the forest has a better ability to handle climate extremes. In contrast, a higher density forest without fire becomes a low-resistance landscape. As such, current forest management practices which attempt to prevent fire from occurring would benefit from adjusting current practices to those which would promote a more resilient landscape.

During their study, the FHiRE team worked closely with the Jemez Fire District and members of the modern Jemez Pueblo. The loss of control of a prescribed fire in New Mexico in 2010 demonstrated the high cost of a close Wildland-Urban Interface wherein property can be destroyed. Previous studies have shown a non-linear association between population density and fires. When there is an increase in population, there is a corresponding increase in fires. However, when the population density reaches its highest point where there is no fuel for fires, fires decrease. This is a similar pattern seen in the Jemez landscape where prehistoric population density was considered to be high density. Did traditional Hemish farming practices reduce fires on the landscape? What were the consequences? What were the behaviors which lowered the fire risk? The researchers used a variety of study techniques to create a pyro-geographical profile of the area. The techniques employed included ethnography, geoarchaeology, dendrochronology, paleoecology, archaeology and ecological modelling. Ethnographic information was gathered by surveying the area with members of the Jemez Pueblo, who were able to identify fire practices and fuel uses in different spatial scales. For example, fuel would be collected from nearby spaces for cooking and heating within households in a village. Out in the agricultural fields, fire would be used to clear away vegetation to improve the soil and increase production. In the forest, wood from younger trees would be harvested for architectural use, and undergrowth may be cleared by burning to improve plant harvesting, wild resource processing or to encourage plants which would attract animals. Geoarchaeological analysis of charcoal and thermoluminescence analysis of ceramics indicated that Hemish fires were numerous, but they were small in size and of low intensity. The analysis of tree rings also reflected this pattern with seven to nine fires occurring per decade. Pollen analysis showed an increase in grasses during the initial settlement period and a drop in mixed conifer forest with the

establishment of settlements. Later, an increase in mixed conifer forest was seen in correspondence with a population decrease. Archaeological work at settlement sites showed that there were no trees within two football fields length of a village. Ecological modelling was used to run various scenarios which ultimately demonstrated the influence of Hemish activity to create a resilient environment.

This multipronged approach showed marked differences between the Pre-Pueblo Revolt period and the Post-Pueblo Revolt period. Between 1450 BCE and 1650 BCE, large fires were absent during the Hemish occupation. Fires during occupation were small and patchy which indicated that Hemish activity reduced forest vulnerability and maintained forest resilience. After 1650 BCE, after depopulation of the area due to disease and the impact of Spanish Colonialism, fires in the area become more widespread and regular, spreading as far as there was fuel available and the climate permitted. The study revealed the Hemish were fire-wise as reflected by their reserved use of fire for particular purposes and in specific places. It was also reflected in their practice to thin and remove trees and vegetation to create a defensible space around their living space. They were cautious and respectful of fire as a hazard, but also held a positive attitude towards fire for the richness it provided to the land. As such, fire was culturally valued as it is today amongst members of the Jemez Pueblo. The same cannot be said for the larger non-native society which largely sees fire as something to avoid all together.

Dr. Roos concluded his presentation by noting that Native Americans have had a long history of fires on their landscapes. Therefore, Native Americans should be incorporated into present-day fire management. Their experience would help to create healthier forests which are more resilient to wildfires, thereby reducing the loss of lives and property. Craig Dengel and other members thanked Dr. Roos for an informative talk and asked him several questions.

For further information on this topic, please refer to Dr. Roos' publication page (<https://people.smu.edu/croos/publications/>) as well as videos available on his home page (<https://people.smu.edu/croos/>).

The meeting adjourned at 7:53 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS.

DC-CAS BOARD MEETING MINUTES AND FINANCIAL STATEMENTS:

Please note that the monthly Board Meeting Minutes and the quarterly Financial Statements will no longer be published in the All Points Bulletin. These documents are available to all Chapter members upon request. Please contact us should you wish to view them.

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Suggestions for book reviews should be sent to the editor. Books for review should be sent to:
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