COLORADO STATE UNIVERSITY 2006 AP460 FIELD CLASS IN ARCHAEOLOGY

ABSTRACTS FOR PRESENTATIONS AT
64th PLAINS ANTHROPOLOGICAL
CONFERENCE

Bechberger, Jillian (Colorado State University) and **Lawrence C. Todd** (Colorado State University)
Session 28. ***Archaeological Site Taphonomy: The Interplay of Biologic Activity and Geomorphic Processes***

Burrowing organisms exert substantial influence over the physical, chemical, and biological structure of ecosystems. In archaeology, sub-surface faunalturbation is often associated with significant site disturbance, particularly the loss of stratigraphic integrity. While horizontal and vertical translocation of cultural material can occur, fossorial activity, coupled with geomorphic processes of erosion and deposition, is capable of preserving archaeological contextual information. Research conducted in 2006 investigated the interaction of landscape features, pocket gopher *(Thomomys talpoides)* activity, and sedimentation processes on site formation at a high altitude lithic scatter in northwestern Wyoming. Located in an alpine parkland (elevation 3100m), the terrain is characterized by hummocky, gentling sloping hills that terminate in shallow, concave depressions known as sag ponds. Sediment ejected during pocket gopher tunneling and mound building is redistributed by wind and sheetwash into the sag ponds. These geomorphic processes create a depositional environment capable of burying cultural material. To determine the extent of sub-surface archaeological deposits two 1 by 2-m test units were excavated at a dry sag pond. Pocket gopher mounds were extensively documented and topography was mapped to sub-centimeter accuracy. Post field laboratory work, including radiocarbon dating and sediment analysis will provide information on the timing and rate of deposition. Examining the relationship between geographic position, biological activity, and artifact size will elucidate the degree of post-depositional artifact movement. Research assesses the overall influence of fossorial rodents on archaeological site formation. Clarifying the interaction of biological and physical processes will aid in the interpretation of patterns present in the material record.

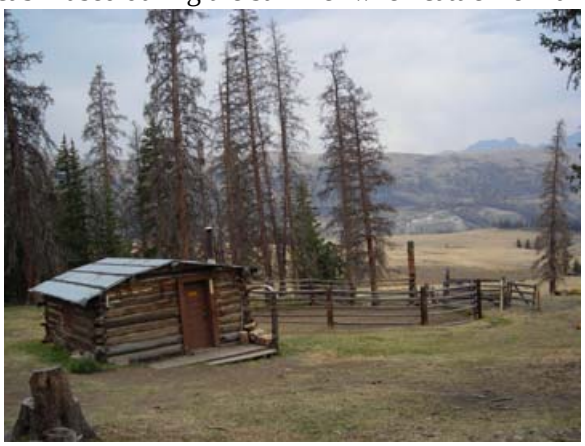
Fredriksen, Anwen (Colorado State University)
Session 28. ***Walking the Line: Spatial Patterns of Artifact Distribution in Alpine Environments***

The distribution of archaeological artifacts across a landscape is indicative of both natural and human processes at work over time. Both the natural movement of sediment and the deliberate human choice of location for habitation or working tools contribute to the patterns of where artifacts are found today. In the mountains of the Greybull River drainage system in Northwestern Wyoming are several sites with varying densities of artifact distribution. After conducting five-meter spaced surveys, patterns of artifact locations became clear. By plotting artifacts and comparing their distribution with the geographic formations present in the area,

the goal is to determine to which degree either human or natural processes impact the present-day discovery of archaeological artifacts. Overlaying the GPS plots of artifacts on detailed topographic maps of natural land formations clearly expresses the predictably differential distribution of human artifacts. This study aims to understand the observed patterns of artifact location in relation to their setting in the landscape, accounting for geomorphic events, animal impacts, and human actors, past and present, affecting the locations at which artifacts are found on the landscape of today. The setting for this study is particularly useful for collecting data because of the low impact humans have had on it in recent decades, because of the range of geographic features on the landscape, and because of the great number and variety of artifacts recorded.

Galloway, Matthew K. (Colorado State University) and **Marcy Reiser** (Colorado State University)
Session 21. **T*he Rings of Time: Dendrochronology at Jack Creek's Cow Camp***

Dendrochronology reveals more than just when something happens. It can also reveal processes of human interaction with the landscape. During the 2005-2006 field seasons, investigation was conducted at a ranching cabin used during the summer when cattle from a nearby ranch in Wyoming's Big Horn Basin were moved to summer grazing on leases in the Shoshone National Forest. Research based on 13 historic cores, 10 cross sections and 7 cores from nearby trees are used in beginning development of an understanding of cabin construction and usage of the surrounding forest. Events such as drought and fire are also recorded in tree rings. By matching dates from our samples to a skeleton plot – developed as part of a broader investigation of historic dendroecology in the Absorkas – temporal patterns in usage of forest areas are revealed. The samples are derived primarily from trees and stumps with indications of human modification, such as axe marks. This gives further insight into the way life progressed during late 1800s cabin building. Was it more important for humans or livestock to be housed first? And did climatological factors inhibit the building of the cabin? Understanding the way environmental factors helped or hindered past construction of cabins is useful in understanding how people adapted to and utilized their environment.



Gensmer, Kristin (Colorado State University); **Marcy Reiser** (Colorado State University), and **Eva Donkin** (Colorado State University)
Session 21. *Tale* ***of Three Cabins: A Comparison of Features and Architecture***

Historic cabins can show patterns of land use in remote areas. Three abandoned historic cabins were recorded during the Summer 2006 GRSLE project in the Shoshone National Forest in Wyoming. Compared to many areas in the Greater Yellowstone ecosystem, this region has escaped many of ecological modifications that coincide with the development of the tourist industry. The study of this exceptional area is important because, even though the area is relatively safe from construction and other such man-made dangers, other biological and physical processes continue to modify the archaeological record. Research demonstrates some of the more striking

similarities and differences between the cabins, which are designated the 1) Sheepherder's cabin, 2) Chico's cabin, and the 3) Meadow cabin. Data on architectural features and styles of the cabins as well as the presence and content of rubbish heaps were collected as were historic cores for dendrochronologic analysis. While the Sheepherder's cabin and Chico's cabin share many similar architectural features, including orientation, evidence of sod covered roofs, and the presence of rubbish heaps, the Meadow cabin, which was consumed by the Little Venus Creek forest fire, tends to differ in architectural style and the lack of a discernable rubbish heap. Possible explanations for the similarities and differences in the three cabins include different regional origins of the builders and construction at different times. Data from such cabins are essential to understanding historic land use in remote alpine regions and the development of contemporary landscapes.

Gingerich, Eric (Colorado State University); **Jillian Bechberger,** (Colorado State University) and **Lawrence C. Todd** (Colorado State University)
Session 28**. *Sediments in a Slump: Depositional Dynamics in and Around Alpine Sag Ponds***

One of primary landscape altering features of northwestern Wyoming's Absaroka mountains are numerous mass wasting events representing many temporal and spatial scales. For two field seasons, research at a high elevation (3100m) archaeological site (48PA2874) on one such feature has investigated human land use patterns relating to the terrain created by a late Pleistocene or early Holocene landscape altering event. The slump produced a hummocky surface with several depressions allowing ponds to develop from seasonal precipitation. These sag ponds became a focus of human use, from late Paleoindian through the Late Prehistoric. There would have been good sources several resources (food, water, shelter). Examination of the sediments in two 1x2 m test excavation units provides satisfactory evidence for the slump model. The profile of the excavations exhibit differences in soil types from the top to the bottom of the units, and even more differences when comparing one unit to the other. The unit furthest from the pond, the large rocks and the lighter brown colored soil originating from the original mass wasting event are at the top of the unit with a high artifact frequency. The unit on the side of the sag pond, which often contains year-round water, but in summer 2006, dried up completely, had darker soil with a depth of at least 1.5 m, and much lower artifact frequency. These alpine ponds as effective sediment traps provide a unique opportunity for incorporating cultural materials into an otherwise shallow, high elevation archaeological record.

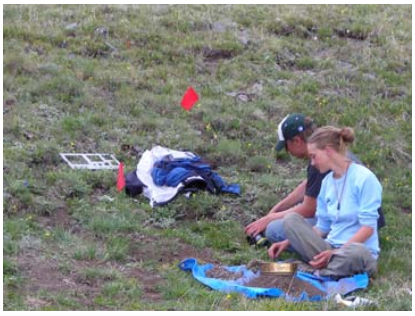
Hare, Kristen (Colorado State University)
Spatial Patterns at a Montane Lithic Scatter Site, 48PA2736, Washakie Wilderness, Northwestern Wyoming

Lithic scatters are invaluable sources of information on prehistoric landuse patterns. They are also susceptible to damage from contemporary landuse. Being so available, these sites are ideal for obtaining knowledge of site transformation with minimal intrusiveness and landscape alteration. Surface lithic scatters are abundant in the

Washakie Wilderness of Northwestern Wyoming. Site 48PA2736 is one such site. The site is located at the confluence of two major tributaries of the Greybull River at an elevation slightly above 2700m. The surrounding terrain is high mountain grassland bordering on coniferous forest areas ideal for exploitation of multiple landscape resources. A non-systematic survey of the site was done by the 2006 Colorado State University Archaeological Field School students. The goal of the study was to record the site to provide baseline information for monitoring site alteration/formation processes. A spatial analysis was done on the site to determine whether there were any spatial clusters of artifacts and if so whether they were deposited by physical or cultural processes. Altogether there were slightly over 3,000 flakes and angular debris recorded and a total of nearly 70 formal stone tools (including 11 projectile points), with these items representing five distinct components on site: Paleoindian, Early Archaic, Middle Archaic, Late Archaic, and Late Prehistoric. On the west side of the site an incised stream channel has exposed artifacts indicating the potential for subsurface as well as surface lithic scatter. In order to further evaluate the cultural relevance of observed artifact clusters additional research questions are summarized.

Herron, Amanda (Colorado State University)
Session 28. ***Burrowing for the Facts: Formation Processes of Pocket Gopher Mounds In the Upper Greybull River Watershed of Wyoming***

Pocket Gophers, *Thomomys talpoides*, at the Upper Franc's Fork drainage site 48PA2874 near Meeteetse, Wyoming, show considerable effects to archaeological sites, by moving stone artifacts in and out of their burrows. By scouting out, screening and measuring rock size, sediment amounts, length and surface area of tunnels and mounds, we see that these rodents signal the potential for sub-surface cultural material. Twenty six winter tunnels and 20 entrance dirt mounds were observed surrounding the site. The average rock moved in the mounds was .96 liters and the average sediment was 4.24 liters. On the other hand, the average rock moved in the tunnels was .97 liters and the sediment was 4.29 liters. Amongst these, a total of 22 pieces of chipped stone were discovered in the mounds and 73 pieces of chipped stone and 5 pieces of angular debris were discovered within the tunnels. Rocks larger than 45mm were encountered amongst the tunnels and mounds. Although, the depth of the burrows surrounding this site were not recorded, sediment samples were taken and the soil was found to be dark and lacking clay unlike the nearby excavated plots with clay-rich sediments. This suggests that the pocket gophers were able to turn up a considerable amount of dirt. The moisture in the soil and the longevity of atmospheric gases within a tunnel contribute to the burrow construction and thus the condition of the chipped stone. The climate and pocket gopher behavior play an important role on revealing artifacts.



Keeling, Kris (Colorado State University)
Session 28. ***Archaeologists as Landscape Modifiers: Monitoring Ecological Impacts of Excavation in an Alpine Environment, Absaroka Range, Wyoming***

As traditionally practiced, archaeology is seen as a discipline focused on issues that often involve prehistoric human impacts on their environment. Present day archaeologists are becoming more diversified in their interests on ecological impacts at a number of temporal and spatial scales. As part of a more general trend toward

conservation oriented archaeology, this concern for evaluating impacts is being extended to methods of extracting or observing artifacts in situ. Particularly in areas of fragile ecology, conservation archaeology is becoming more relevant in order to preserve the landscape integrity of the site and artifacts for future research, further improving the intrinsic value of the area for generations to come. Excavation of sensitive sites such as those in the Jack Creek drainage of the Absaroka Range, Wyoming, has focused on monitoring human impacts on sites in the area in terms of both the bio-physical and cultural actions, including archaeological research itself. By observing sod deposition, traffic-related erosion, and floral and faunal disturbances caused by test excavations and its human drivers, a case study of ecological impacts around an excavation unit is described. Two 1x2m test units of 48PA2874 served as an experiment in monitoring ecological interruptions due to archaeological investigation.

Knapp, Ashleigh (Colorado State University)
Session 5. ***Archaeology Under Fire: the Impacts of Forest Fire on Archaeological Inquiry***

This research evaluates the impacts of wildland fire on archaeological sites Following the 34,000 acre Little Venus Fire in northern Wyoming, known archaeological sites along the Greater Greybull Drainage where categorized by the degree of burn intensity – severe, moderate, and low – to determine differential heating patterns in the area. Colorado State field school students also documented the change caused by fire on cultural artifacts and the surrounding landscape. A noteworthy effect of forest fire is the expansion of many previously documented sites, either by spatial scale or in number of artifacts, due to the removal visually obstructing vegetation. The presence of oxidized sediments that are remarkably similar in appearance to hearth spots is another significant effect. The forest fire directly altered surface artifacts in ways including, a variety heat related fractures, the color and texture change of raw material types, vulnerability processes of erosion, and looting due to exposure. Effects varied depending on position and the suggested intensity of the fire in that location. However, most of the findings and results follow expected patterns suggesting that these patterns can be applied to help decipher other sites that have witnessed wildland fires and indicates that such change can be predicted and incorporated into a more general understanding of archaeological site formation processes.

Martinez, Daniel (Colorado State University) and **Lawrence C. Todd** (Colorado State University)
Session 28. ***Tunnels in Time: Analysis of Lithics and Charcoal through Auger Probes***

48PA2874 is a high alpine site near the Jack Creek drainage in the Shoshone National Forest in northwestern Wyoming. The site is located in and around a seasonal sag pond that forms at the base a Pleistocene slump. Auger probes were used to learn more about the potential for buried artifacts at the site, get an idea about the sediment beneath the site and learn more about the Pleistocene mass wasting that formed the landscape on which the site now sets. A total of 14 auger probes were dug on the site, which bisected a profile of test units. The auger holes typically collected 9-15cm of sediment in each run. Lithics where typically found in the first few runs, ranging from 0

to 30 cm below the surface. The sediment from 0-30 cm below surface was primarily finer grained sand and light clay. The sediment below 30cm consisted of dark, thick organic clay. No lithics were found below 30cm, but charcoal was consistently found between depths of 30-100 cm. A pattern emerged in which there was a higher frequency for lithics to be found in the finer grain sediments near the surface than for them to be found in the rich organic clay that was at a greater depth.

McElhoe, Ryan; (Colorado State University) and **Lawrence C. Todd** (Colorado State University)
Session 28. ***Scratching the Surface of Prehistory in Northwestern Wyoming: An Analysis of the Dynamics of Site Formation and Alteration in an Alpine Setting***

To gain a better understanding of the interplay between hunter-gatherer ecology and landscape dynamics in the Rocky Mountains, this research analyzes cultural materials from a lithic scatter on a site in the Absaroka Mountain range, Northwestern Wyoming. Located at approximately 3100 meters in elevation, the site contains 2471 pieces of chipped stone and diagnostic artifacts from the Paleoindian through Late Prehistoric periods. A 100x100 meter grid surrounding a sag pond (depression filled with seasonal snowmelt and rainfall) is examined for patterns indicative of cultural and geomorphological processes. The focus of this study is on colluvial, alluvial and cyroturbation events. The objective being to determine the context of the lithic deposits; that is, do the deposits imply cultural deposition or geomorphic disturbance? This research aids in an interpretation of the site and in a broader sense, site dynamics relating to alteration of cultural remains. Following this analysis archaeologists and paleoecologists will have an improved understanding of the processes affecting archaeological sites located in alpine zones, allowing for more accurate interpretations of these sites.

Rasmussen, John (Colorado State University) and **Lawrence C. Todd** (Colorado State University)
Session 5. ***Raising the Red Flag: The Use of Systematic and Non-systematic Survey in the Archaeological Site Discovery***

Examination of site discovery methods and evaluation of archaeological survey design are of central importance to developing interpretations about prehistoric landuse patterns. Results of a 110 ha block survey conduced in June 2006 on Francs Fork drainage, a tributary to the Greybull River in North-Western Wyoming are examined to assess several approaches to site discovery. Four sites, temporarily coded as sites 06005, 06006 and 06007 offer an abundance of artifacts ranging in material from chert to quartzite and projectile points dating from Late Paleoindian through Late-Prehistoric. Unique geological features in the site areas include volcanic ash beds, game trails bisecting sites, dried mountain ponds and gullies that serve as collecting pools for runoff, and an abundance of unmodified silicified sediment (a source of materials occasionally used for expedient tool manufacture). These sites, discovered through five meter spacing pedestrian surveying methods, lie in proximity to the already registered site 48PA2874. Five meter transects were performed across the survey area, with pin flags placed as visible artifacts were encountered. Survey crews were instructed to move at a constant pace (2 km/hour) and not stop and intensify their search in areas where one artifact was encountered. Once the block survey was completed, surveyors returned performed a less systematic survey of flagged areas. Done in cooperation with systematic line surveying, we were able to achieve both a more developed knowledge of the survey area and efficiently survey a large area in a relatively short time.

Svatos, Sara E. (Colorado State University) and Lawrence C. Todd (Colorado State University)
Session 28. ***Assessing Alpine Artifact Abundance and Depositional History of the Greater Yellowstone Ecosystem, Wyoming***

Geomorphology and archaeology are richly interconnected on many levels, one such aspect is the interaction of depositional processes and artifact burial. In 2006, Colorado State University conducted test excavations in the greater Yellowstone ecosystem in the Absaroka mountain range, Wyoming. Test units were laid down to evaluate below surface artifact density, and how the frequency of these artifacts relates to geomorphological processes. Research evaluates deposition of sub-surface artifacts between two test units. The location of the two test units (T and U) were along a slump that led down to a sag pond. Higher along the slump was the T-unit, while U was further down and closer to the sag pond. Due to erosion and depositional forces, the T-unit contains a higher artifact frequency because of the relation to its location on the landscape and sag pond. Methods used for data collection included; use of an EDM to lay down the test units and piece-plot artifacts and samples, excavation of two- one by two meter units, and collection of sub-surface artifacts. This research is important because it shows geomorphologic forces, that effect artifact movement beginning in at least the Early Holocene.

Todd, Lawrence C. (Colorado State University)
Session 30. ***Burning Issues: Archaeological Monitoring and Site Disturbance Processes***

During June-August, 2006, the Little Venus fire burned portions of an area encompassing nearly 14,000 ha (>34,000 acres) along the upper Greybull River and its major tributaries in northwestern Wyoming. The fire perimeter surrounds about100 prehistoric archaeological sites recorded over the last five years as part of the GRSLE project (www.greybull.org). Given the mosaic nature of the fire, with some areas intensively burned, and others having no burning whatsoever, impact assessment requires site-by-site revisits. Preliminary impact data have been collected from 48 sites during post-fire revisits in August and September. Of these, 19 (40%) suffered no direct, fire-related impacts, while five (10%) were exposed to 100% burns, with large portions of the site's surfaces now being bare mineral soil with very high artifact density and visibility. The 19 remaining sites suffered varying degrees of burning. Direct fire related impacts observed at 12 sites include 1) thermal damage to artifacts (discoloration, crazing, potlidding, and spalling) and 2) alteration of sediments as discrete patches of oxidized sediments and artifacts that could, after the passage of a few years, be mistaken for prehistoric fire hearths. Removal of vegetation opens sites to at least three forms of indirect impacts: 1) erosion/deposition, 2) wind scouring and deflation of site surfaces, and 3) artifact collecting and looting. Examples of using data from these natural experiments in site formation are described and the utility of systematic site monitoring protocols to deal with site disturbances at a variety of spatial and temporal scales are outlined.

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