Morainal Archaeology: Alpine Landscapes and Raw Material Procurement

Reitze, William T., Lawrence Todd, Paul Burnett
61st Annual Plains Anthropological Conference, Fayetteville, AR- October 2003

Abstract

The Absaroka Mountains of Northwestern Wyoming have yet to receive in-depth archeological analysis. As part of the ongoing Greybull River Impact Zone (GRIZ) project, archaeological survey was conducted at the head of the Wood River in Dollar Mountain and Dunrud Peak cirques and their associated lateral and terminal moraines. Systematic survey was conducted to locate concentrations of artifacts or sites. Once a site was located, a detailed documentation survey was conducted and the artifacts received in-field analysis, recording physical attributes as well as its UTM (WGS84) spatial location. Seventeen sites were located and documented. The sites are in an alpine or high mountain environment and ranged in elevation between 3040 m and 3350 m with the primary site being located at 3340 m. Two of the sites contained diagnostic projectile points, one associated with the Late Archaic time period (3000-1000 B.P.) and the other with the Early Archaic time period (8000-5000 B.P.). Fifteen of these sites were prehistoric sites, or sites with prehistoric components, and two of these sites were affiliated with historic mining activities, documenting a historic, as well as prehistoric, exploitation of this region. The prehistoric sites consisted of extensive lithic scatters, containing both debitage and formal tools. A peak (Dollar Mountain) adjacent to the study area presents an as of yet undocumented source of lithic raw material with an outcrop of fine grained crypto-crystalline chert, which is found in large quantities at the sites. The presence of this new source of high quality raw material has the potential to alter the current models of raw material use in the Bighorn Basin.

Introduction:

During the summer 2003 field session a high altitude survey was conducted in Dollar Mountain Cirque to determine the extent of Prehistoric occupation and use of the area. The field work was conducted as part of the Greybull River Impact Zone (GRIZ) project and the Colorado State University field school. Dollar Mountain and its cirque are located at the head of the Wood River, a tributary of the Greybull River in the Absaroka Mountains of Northwestern Wyoming. While preliminary survey reported some occupation, there are no published accounts of prehistoric habitation in this region at this altitude. The cirque itself has undergone a great deal of geomorphologic change; especially due to glacial action. The cirque's most prominent features are the extensive sequence of terminal and end moraines. The occupation of the cirque is intertwined with the creation and modification of these glacial moraines. Through field work this past summer seventeen sites were recorded; fifteen prehistoric lithic scatter sites and two historic mining sites.

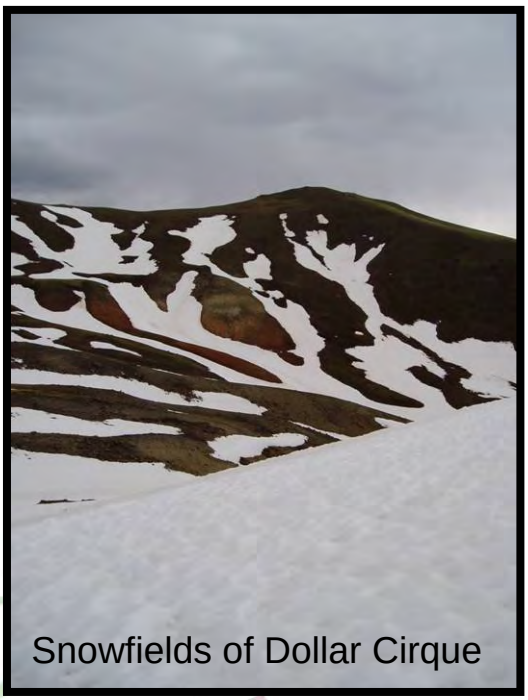
Geologic Setting:
The Absaroka Mountains were created by Tertiary volcanic uplift. The range is the remnants of one of the largest volcanic fields created in North America during the Eocene. The bedrock geology of the area consists of directly deposited or uplifted volcanic rocks and secondarily deposited volcanic rocks in the forms of siltstones, lahars, and flow deposits. Dollar Mountain is a unique geological isolate in a sea of volcanic rock. Dollar Mountain is capped by an uplifted Paleozoic block with a stratigraphic sequence ranging from the Cambrian to the Pennsylvanian. This uplift contains sandstones, shales, and limestones, the sources of Dollar Mountain chert.

Environment:
The elevation of the study area ranges from base camp at 2920 meters to the highest surveyed moraine at 3450 meters. The highest point in the Absaroka Range, Francs Peak, is to the northwest of the study area. The vegetation ranges from interspersed conifer forest and sagebrush steppe to high altitude plant communities of narrow grasses and sedges. The newer moraine deposits have yet to accumulate much soil and are colonized primarily by lichens. The temperatures at this altitude remain relatively low year-round and there is permanent snow in the cirque. The annual precipitation is 50 cm with mean annual temperatures of 35 degrees Fahrenheit. To the west of the site is a rock glacier. During the survey snow field melt was recorded as the artifacts were uncovered by the melting snow. The presence of large snowfields and glacial terrain created an unusual environment to conduct archaeology. Working conditions in the field were hampered not only by the rough terrain, but also the unpredictable weather. During the field session in June several snow storms, violent thunder storms and hail were encountered by the field crew.

A snow storm in June, down the cirque makes for an interesting field setting.

Glacial Action:

Dollar Mountain Cirque is a prime example of glacially altered terrain. The flat level floor of Dollar Flats is a Pleistocene erosional surface, probably representing the floor of a hanging valley. Throughout the Upper Wood River hanging valleys are evidence of glaciation. Glacial till deposits at the mouth of Dollar Cirque correspond to the Pinedale glacial episode. The cirque itself is filled with terminal and lateral moraines representing Neoglacial advances from the head of Dollar Cirque and its tributary Dunrud Cirque. It is possible that these Neoglacial episodes (specifically the Little Ice Age) have removed evidence of higher altitude as well as any Paleoindian aged components. Evidence of glacial striations and glacial polish are present in the Wood River valley at locations high above the modern valley floor.



Snowfields of Dollar Cirque

Methods:

Several methods were employed during the 2003 field season. Pedestrian survey was conducted across a large majority of the Dollar Mountain cirque. The survey was conducted with a 2 meter interval until artifact concentrations were located. These were then resurveyed at 70 cm intervals. The provenience of all located artifacts was then recorded with a Garmin Rino 110. The provenience of the artifacts found during the partial survey of DM001 was then additionally recorded with a Sokia total station. Topographic points were recorded by using an Ashtek sub-centimeter GPS. The densest concentration of DM001 was recorded using a box method sampling technique, where a transect of 50 cm boxes were laid across the site. The number of flakes was then recorded; tools and non-flake chip stone were documented. The raw materials were also noted. The remaining artifacts were recorded "in-field" as per the capture and release program; noting their metric attributes, raw material, and tool/debitage type.

Early Archaic Projectile Point
from DM001 8000-5000 BP

Dollar Mountain Chert:
Dollar Mountain contains an unreported source of fine grained cryptocrystalline chert. It ranges in colors from a black through dark brown/tan into a red. The majority of the chert contains chalcedony inclusions, often quite large.

It appears outcropping at the source as well as in moraine deposits in Dollar Cirque and the Wood River extending as far as JoJo Creek and in terrace deposits extending into the Big Horn Basin.

Results:
Preliminary analysis of the archaeological assemblage at Dollar Mountain is summarized in *Table 1* and *Chart 1*. Of the seventeen sites analyzed, fifteen had a prehistoric component with thirteen of those having only a prehistoric component. . The occupation ranged from the Wood River to almost the highest snow free areas of the cirque. Of the five sites where the raw material was analyzed, chert from the Dollar Mountain outcrop accounted for 75% of the assemblage. At DM001 Dollar Mountain chert accounted for nearly 90% of the assemblage.

Conclusion:
The use of the area is characterized by occupation ranging from 2900 meters to an elevation of 3380 meters. Raw material analysis has shown the use of Dollar Mountain chert is quite extensive. The projectile points provide some idea of occupational period as diagnostic Early and Late Archaic projectile points were found. The potential exists for documenting mobility and raw material use in this little studied region. Archaeological data such as this has the potential to contribute to broad scale analysis of the region. Already detailed studies of the glacial sequences of the Upper Wood River have been conducted, and dated archaeological assemblages can only contribute to a better knowledge of the glaciations and moraine sequences of the region. High altitude occupation and ecological data can provide models for understanding human land use patterns, over long periods of time in areas with fluctuating climates.

References Cited

Breckenridge, Roy M. 1974 Quaternary and Environmental Geomorphology of the Upper Wood River Area, Absaroka Range, Wyoming, Unpublished PhD dissertation, Department of Geology, University of Wyoming, Laramie

Frison, George 1991, Prehistoric Hunters of the High Plains, Academic Press. New York

Love, John D. 1939, Geology Along the Southern Margin of the Absaroka Range, Wyoming, Geological Society of America Special Papers, No. 20. Waverly Press, Inc. Baltimore.

Many thanks to the crew

Dollar Cirque Profile

DM001

Dollar Cirque

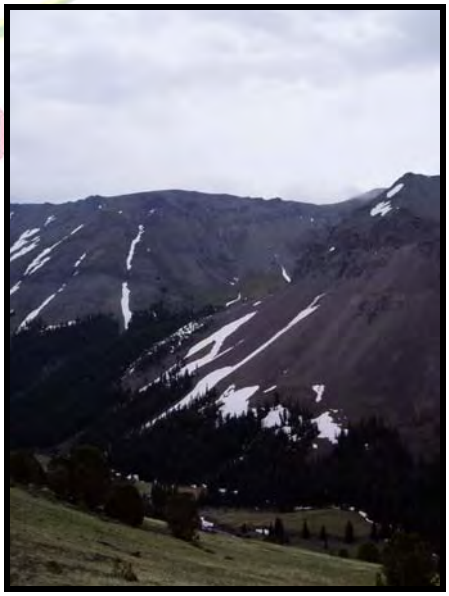
Artifacts at DM001

Down Dollar Cirque

The many tributaries of the Wood River provide opportunity for additional archaeological discovery.

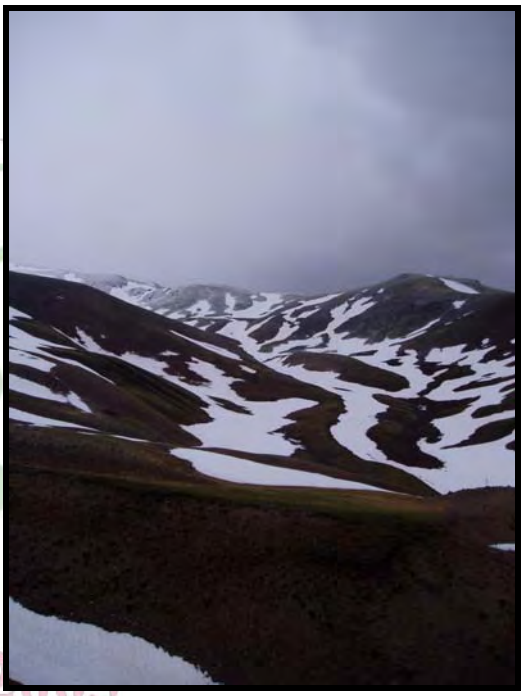
Neighboring cirque near Bear Pass

Horse Creek



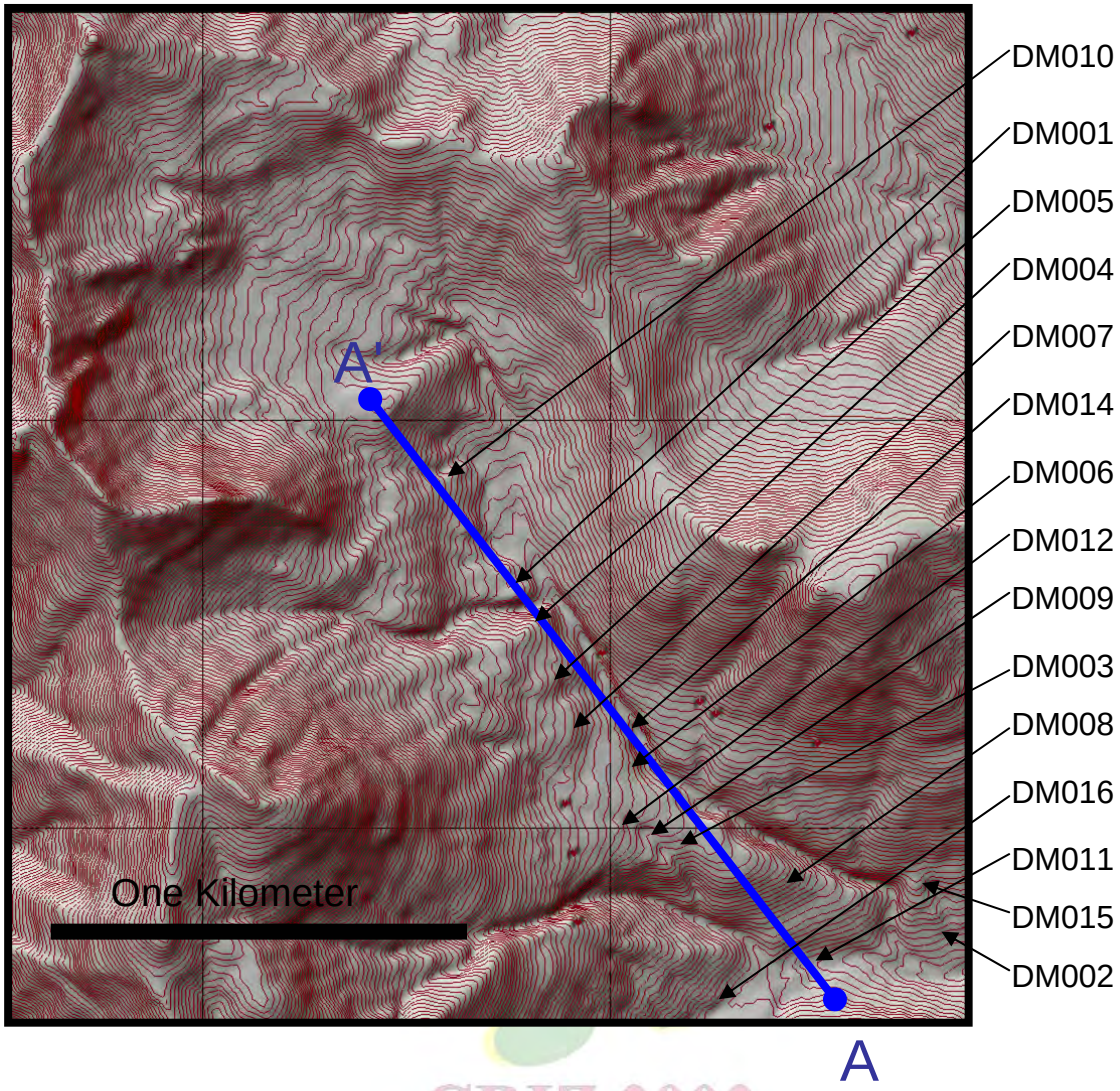
Looking Down the Upper Wood River from Horse Creek

The glacial terrain creates a unique archaeological setting, here the crew works on DM004 on a Neoglacial moraine



Summer snow in the Cirque

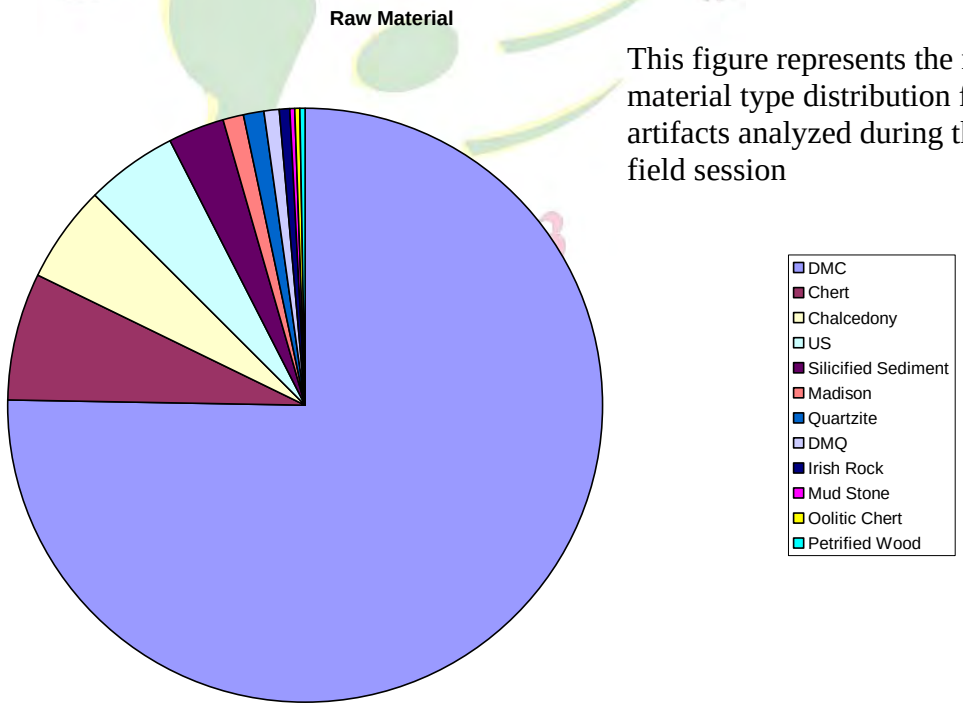
The project area, looking up Dollar Cirque



Map of Dollar Cirque, showing the locations of the recorded sites. A to A' represents the cross sectional profile above.

Site Summary table			
Site Number	Elevation	Number of Artifacts	Component
1	3333	538	P
2	3152	45	P
3	3263	Part of DM flats	P
4	3325	250	P
5	3336	68	P
6	3271	Part of DM flats	P
7	3309	Not Analyzed	P
8	3180	Not Analyzed	P
9	3264	Part of DM flats	P
10	3381	23	P
11	3094	Historic Site	H
12	3290	Part of DM flats	P
13	3120	Historic Site	H
14	3275	31	P
15	3140	58	P/H
16	3149	Not Analyzed	P
17	2919	16	P/H
DM Flats		350	
Total Analyzed Artifacts		1379	

Site Summary Table includes the total number of artifacts recorded and analyzed from the summer 2003 field session



This figure represents the raw material type distribution for all artifacts analyzed during the 2003 field session