Prehistoric Lithic Material Distribution along the Upper Greybull River:

An Inter-Basin Comparison,

Park County, Wyoming

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Abstract

The Greybull River travels northeast from the Absaroka Mountain Range through the Washakie Wilderness of Wyoming covering an area of diverse natural resources. Distinct environmental variations are observed throughout the drainage systems over elevations ranging from 2280 meters to 3705 meters. Eocene volcanic activity has also contributed to a dynamic landscape of weakly consolidated volcanic bedrock prone to mass wasting which creates and exposes geologic resources. Complimenting this rich landscape is a long history of human occupation. On-going archaeological and ecological research conducted by Colorado State University during non-collection pedestrian surveys in the 2002-2004 field seasons has provided opportunity to explore these occupations in association with the natural landscape. Data gathered from over 150 sites along eight different tributary drainages of the Greybull River identifies both local and non-local materials used to make and reshape stone tools. Using the database, each drainage system is examined based on dominate lithic material used, primary materials used for specific tools, and the overall diversity of resources and their distribution to provide a large-scale, non-site comparison of basin aggregate samples. Identifying differences and commonalities between archaeological occupations broadens our picture of this still largely unknown area allowing for issues such as chronological variation and prehistoric mobility to be addressed.

Introduction

Based on field survey data collected over the past three years both intensive and extensive approaches have been used:

Extensive approach

Information is collected on a regional scale in an area encompassing over 1000km² and ranging from ~2280m to ~3705m, allowing for regional patterns and comparison.

Intensive approach

Using an in-field capture and release program, material type, metric attributes, and tool or debitage type are recorded for each individual artifact. Environmental setting and context are also documented.

Raw Material Reference

Purpose

Detailed site information paired with the continuing acquisition of regional data provides the following opportunities:

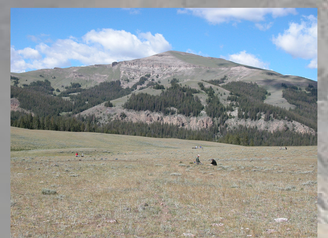
-Viewing the cultural record on different spatial scales to search for broad reaching patterns

-To address issues of how scale might determine interpretation

-To address multiple factors that influence patterns we see at different scales of analysis

Environmental Variability

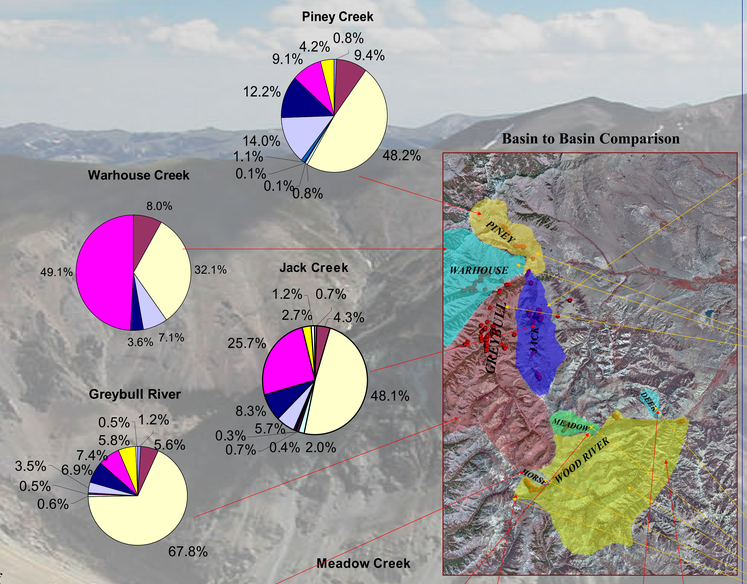
Upper Piney Creek is characterized by open meadows giving way to pine covered hills, while the lower portions of the drainage are steep and vegetation consists mostly of sage and grasses. Site elevations range from 2328-2847m.



Drainages such as Jack Creek vary from steep and heavily vegetated narrows to open valleys of the upper cirque. Site elevations range from 2363-3227m.

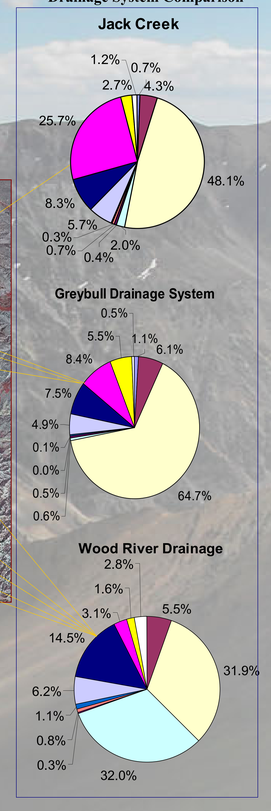
Horse Creek and other drainages in the vicinity are environmentally distinct due to high elevation and past glacial activity. Site elevations range from 3138-3231m.

Meadow Creek displays both open valleys and intermittent vegetation. Site elevations range from 3049-3263m.



Basin to Basin Comparison

Drainage System Comparison



Jack Creek Comparison

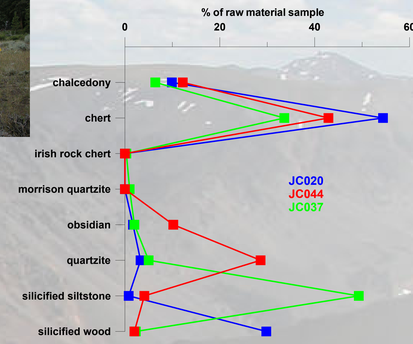
Three elevational zones are represented in the Jack Creek drainage. Three sites were selected for comparison of raw material frequencies within a drainage.

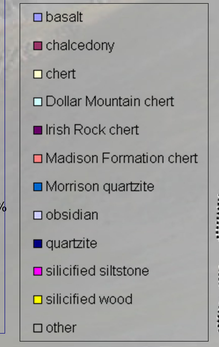
JC020 site elevations 3192-3216m

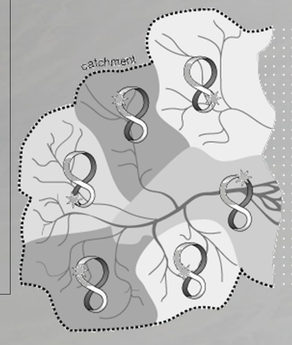
JC037 site elevations from 2363-2426m

JC044 site elevations from 2724-2777

Interestingly, within the drainage the same predominate materials are shown but at varying degrees between the sites.







Panarchy Factor

The panarchy model is a representation of stages going from conservation (forward loop) to reorganization (backloop). The model shows how associated systems can be at various points in an adaptive cycle. In relation to this study, each drainage, due to flooding, fires, deposition, sedimentation, etc. will be at different adaptive stages at different times throughout history. Human use is heterogeneous between drainages, in part, because of these processes. The cultural record is being buried and exposed as each drainage goes through the cycle. Thus the panarchy model helps in addressing factors that explain the archaeological diversity in this region.

Scaling Up

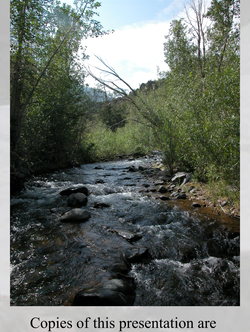
By combining first and second order streams, three separate drainage systems are defined: Greybull River, Wood River, and Jack Creek which are shown in the above comparison. Jack Creek remains separate as it does not join with other streams before reaching Greybull proper. Using a larger scale allows for diversity of materials to be better represented. These drainage system groupings also represent similar environmental areas.

Interpretations

The creek to creek comparison figure identifies each drainage within the study area and displays the total lithic material frequencies. Dollar Mountain provides a nice example of the distribution of a particular chert throughout its neighboring basins. While general patterns are apparent for specific materials, each basin is distinct in the overall materials it contains. Possibilities for these general patterns and variability include factors such as; geological sources, environment and subsistence activities, and time of occupation. The use of chronology as a tool to help explain these patterns is discussed in detail by Burnett (et. al. 2004).

Conclusions

Scaling up has been defined by Hollings and Gunderson(2002) as not just a process of aggregation, but that nonlinear processes determine the patterns that we see. Recognizing these points, we hope to show that with each scale various conclusions can be made. Individual sites show materials specific and limited to a particular range. Larger scale comparisons allow for diversity to be represented. In the future combining both the environmental factors that relate to spatial scale and dynamic of temporal scales will help in reconstructing the dynamics of lifeways of past populations.



Material	Classification	Details
Basalts	local	likely to be local Absaroka tool stone
Chalcedony	local	likely to be local Absaroka tool stone
Dollar Mountain Chert	local	in-field classification based on color, inclusions, cortex, and texture
Irish Rock Chert	local	in-field classification based on color, inclusions, cortex, and texture
Metamorphized Shale	local	likely to be local Absaroka tool stone
Silicified sediments	local	likely to be local Absaroka tool stone
Silicified wood	local	likely to be local Absaroka tool stone
Cherts	unknown	considered on unknown origin unless specified by defining features
Quartzite	unknown	likely to originate in the Greybull basin, though the deposits are probably far reaching
Morrison Quartzite	unknown	geological defined and believed to be available in the basin, but is found beyond this region
Obsidian	nonlocal	analysis on obsidian lithic samples from the region is currently taking place (see Bohn et. al. 2004)

References

Bohn, Allison, Lawrence Todd, Paul Burnett. 2004. "Variability of Archaeological Volcanic Glass Distribution in the Central Absaroka Range, Wyoming." The 62nd Annual Conference of the Plains Anthropological Society, Billings, Montana.

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Gunderson, H. and C.S. Holling (eds) 2002. *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press, Washington.

Copies of this presentation are available at www.greybull.org

The 62nd Annual Plains Anthropological Conference, Billings, Montana