

Groundstone Use at High-Altitude Archaic Sites in Wyoming's Wind River Range

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Introduction

In the summer of 2010, a GIS predictive model was created to help locate and discover Late Prehistoric alpine villages above 10,000 feet in NW Wyoming. Using this technique, 15 villages were discovered and a site patterning was identified based upon geographical and ecological variables centered around Whitebark Pine nut extraction. In addition, the model accurately predicted the location of 6 early to late Archaic sites that bear surprising similarities to the chronologically later villages. This poster explores the possibility that like the late-prehistoric villages, the locations of Archaic sites were chosen based upon their proximity to Whitebark Pine stands.

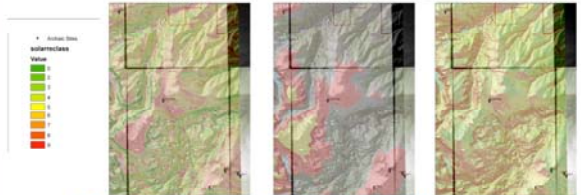
Prehistoric Pine Nut Harvesting

The prehistoric harvesting of Whitebark Pine (*pinus alibalus*) is nothing new. In fact, the earliest piece of groundstone found in North America shows traces of Whitebark residue. It has long been assumed however that Pine Nuts were not a primary resource and were consumed in addition to the hunting of ungulates. That is, prehistoric people traveled into the mountains specifically to hunt but also ate pine nuts because they were there. The 2010 GIS project proved that in the late-prehistoric era this was not true and the sites were likely chosen for their proximity to bountiful Whitebark Pine stands. The same model that suggested a pine nut focused subsistence for later sites also identified a series of much earlier archaic sites bearing the same geographical characteristics. Upon first glance, it seemed like these sites could have also been chosen for pine nut harvesting. Unlike the late-prehistoric sites though, the archaic ones are located nearly 500 feet above modern tree line. A close examination of the artifact assemblage however revealed a surprise. At each site predicted by the 2010 model our team recorded groundstone typical of nut processing, burned artifacts suggesting forest fire, and some remnants of charred timber. These suggest that the sites may have been located within a tree line that was much higher than today's. Thus, a new GIS model was created in attempt to connect the archaic sites to prehistoric pine stands.

GIS METHODS

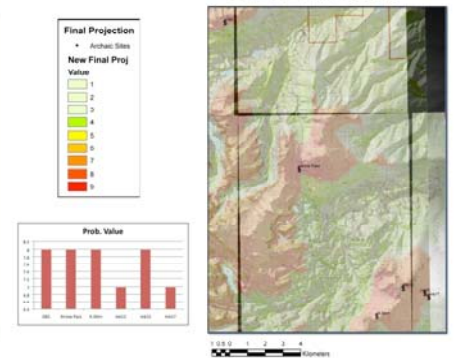
Every archaic site is located between 10,600 – 12,000 feet, on a slightly inclined and sunny slope. Slope and sun exposure have proven to be important variables in predicting the location of modern Whitebark Pine (WBP) stands. It is assumed then that where these elements exist in close proximity, a pine stand is also present. It is believed that slope and sun exposure could further be utilized to identify areas above modern tree line where WBP once prospered. If archaic sites could be located in those areas predicted as candidates to host WBP stands, it is likely they were chosen for that reason. The WBP predictive model was created by the analysis of Digital Elevation Models. First, slope, elevation, and solar absorption rasters were created. Then they were reclassified with values 0 – 9 (unlikely WBP – likely WBP). The three rasters were then combined with a weighted overlay prioritizing elevation over solar radiation and then slope. The final projection identified areas above modern tree line likely of once hosting WBP. The known archaic sites were then spatially joined to the final projection.

Slope Elevation Solar Absorbance



Site Name	Range of Occupation	Groundstone	Probability Value	Solar Value	Final Value
OB1	Cody - Middle Archaic	YES	9	5	8
Arrow Pass	Folsom - Late Archaic	YES	9	7	8
K.Stirn	Early Archaic	YES	9	5	8
Ink12	Middle Archaic	NO	9	2	7
Ink15	Archaic	NO	9	4	8
Ink17	Archaic	YES	9	2	7

Final Projection



Examples of Archaic Projectile Point and Groundstone



The Next Step

This GIS model marks the first step and a single set of evidence necessary to determine the significance of Whitebark Pine to Archaic settlers of the Wind River Range. The results of the predictive model suggest that there may have been a connection, but the extent remains unknown. The next step is simply gathering more information. This will be accomplished through the recording of additional sites and systematic excavation of those mentioned in this poster. This research question is multidisciplinary and will also draw upon dendrochronology, paleobotany, and paleoclimatology for future investigation.

Acknowledgements

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Discussion

The final projection appeared to be successful. It reclassified pixel values from 0 (least probable WBP location) to 9 (most probable WBP location). Each archaic site is located within a level 7 or 8 probability category. At first glance the existence of sites within predicted WBP zones suggests a clear connection between the two. However, while each site is located in a high probability area of the final projection not all meet the requirements of specific variables. For example, Ink12 and Ink 17 are located in an extremely low solar absorbance zones, a believed necessity of productive WBP stands. Perhaps these sites met the requirements of the model but were not chosen for nut extraction.