Migration Corridors, Ice Patches, and High Elevation Landscapes

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ABSTRACT

During the 2016 field season, the Park County Historic Preservation Commission (PCHPC) and GRSLE Archaeology conducted two inventories at elevations from 2700-3500m in NW Wyoming's Washakie Wilderness (Shoshone National Forest). In both cases the project examined relationships between surface archaeology and other aspects of the bio-physical environment. First, a segment of a primary elk migration route from the western Big Horn Basin into Yellowstone Park was inventoried for associated archaeological sites. Second, continuing work begun in 2015, we recorded over 19,000 pieces of chipped stone, many of which were associated with an ice-patch rich alpine setting. Results of both point to the need for greater consideration of transient environmental attributes (e.g., animal movement patterns and persistent snow locations) when considering site locational properties.

Access, terrain, and logistics place constraints on high elevation fieldwork

INTRODUCTION

Study of human use of high elevations often emphasizes physical aspects of the alpine and montane environments such as "local relief, steepness of slope, amount of land in slope, and elevation" or in a more comprehensive view as having five major attributes relevant to human landuse (Aldenderfer 1998: 1-4):

- Environmental heterogeneity
- Extremeness
- Low Predictability
- Low Primary Productivity
- High Instability and Fragility

When aspects of human physiology such as hypoxia are added to the mix, and energy expenditure and mobility costs are considered, the complexity of use of higher elevations are manifold.

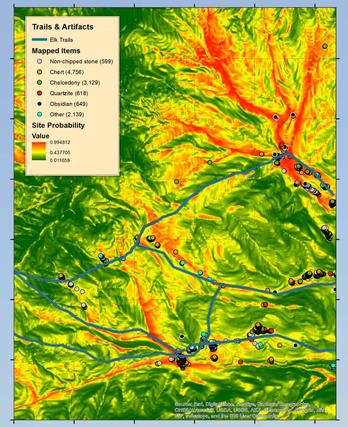
As part of our on-going research into high elevation portions of the Greater Yellowstone Ecosystem (GYE) in NW Wyoming (Todd 2015), our team has worked to refine our understanding of landuse patterns above 2500 m through the development and iterative refinement of a site probability model for prehistoric site locations on the Shoshone National Forest (Burnett and Otárola-Castillo 2008, Burnett and Todd 2009, Burnett and Todd 2010, Burnett, Todd et al. 2014, Burnett and Todd 2014, Burnett, Todd et al. 2015). Given that our model is largely atemporal, it has focused primarily on the generally more stable aspects of the physical environment that are less susceptible change than some of the key biological variables (e.g., tree line, game animal abundance, or variation in vegetative productivity).

During the 2016 field season we directed investigations toward several of the more transient landscape features that may play at least some role in conditioning human landuse decisions. The two attributes examined were game movement corridors and late summer ice patch locations – both of which could be argued to play a role in the high elevation resource predictability.

Documenting sites along migration trails

Hunting blinds along migration routes and GPS data from collared elk moving through project area.

GPS collared elk migration corridors and chipped stone distributions.

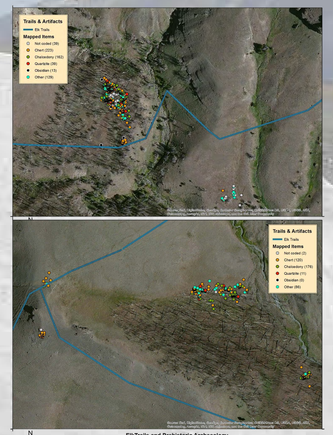


Site probability model (Burnett et al.) with migration corridors.

MIGRATION ECOLOGY AND ARCHAEOLOGICAL SURVEY

While migrations of several species of North American large mammals have recently been the subject of detailed study, the work most relevant to our project area has been conducted with elk by Arthur Middleton and colleagues (Middleton, Kauffman et al. 2013, Middleton, Kauffman et al. 2013, Sawyer, Kauffman et al. 2013, Merkle, Monteith et al. 2016). Although there is little archaeological evidence that human predation of elk was a key component of prehistoric adaptations in the GYE, aspects of the migration corridor studies such as travel costs, and generalized game movement patterns (and perhaps human travel corridors as well) might be conditioned by some of the same factors that influence contemporary elk movement patterns. Therefore, using GPS tracking data provided by Middleton, we targeted montane inventory along well used segments of elk migration corridors, and gave special attention to areas where physical traces, such as well used trail systems, were evident.

Archaeological inventory along several trail systems resulted in the documentation of a range of prehistoric materials that add to information collected during previous year's surveys. However, with the exception of several probable hunting blinds and cairns, for the most part, the locations of chipped stone along migration routes matches the predictions of our existing site probability model. One potential difference between materials recorded on previous surveys and those recorded in proximity to trails that require further work to evaluate is an increased frequency of smaller localities with a predominance of locally available raw material near corridors. Our preliminary thoughts on the migration corridor work is that while such corridors may not be a key element in predicting site location probability, they may be a relevant factor in looking ta landscape patterning in artifact assemblage composition.



Game trails and chipped stone distributions.

Wide range of temporal indicators at single sites and across high elevation landscapes.

Copies of this poster available at:
www.grsle.org/Conferences/Todd_et_al_2016_Elk&Ice.pdf
Or use this QR code:

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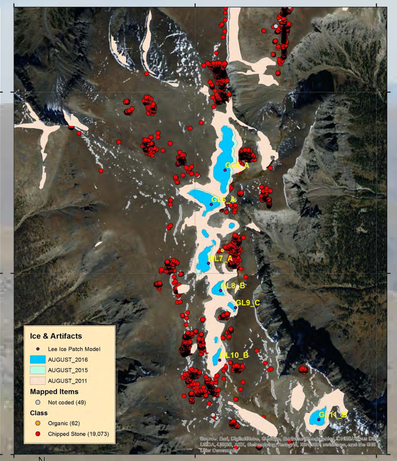
Hunting blinds and ice patches.

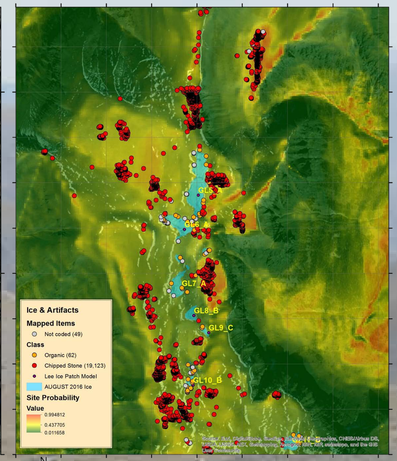
ICE PATCHES AND LANDSCAPE ARCHAEOLOGY

The discovery of rich and diverse organic artifacts and associated paleobiological material from dwindling ice patches has provided an unexpectedly rich addition to global (Reckin 2013) and regional (Lee 2010, Lee 2012) archaeological records. Like the migration corridors, attributes of these features of alpine landscapes are not incorporated in our current site probability models (although variables such as solar insolation, which are part of our recent models, are likely relevant). Beginning in 2015 our team has been examining a series of 11 ice patches that Craig Lee had identified as being persistent and having locational characteristics amenable for the recovery of ancient perishable materials. Of particular note in terms of organic artifacts are two wooden bows recovered in 2015 (Reckin, Kelly et al. 2016).

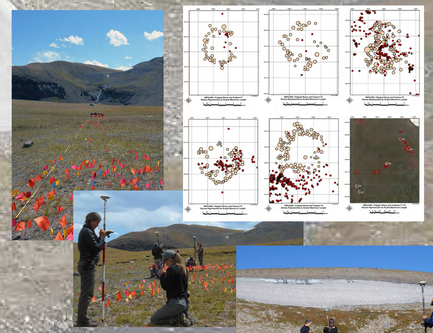
In addition to the perishable materials, these ice patches are of note because of the very rich associated chipped stone record. Our surface inventory has documented nearly 20,000 pieces of chipped stone in only 174 ha of block survey (artifact density of 112 artifacts/ha). Materials range in age from a complete Alberta Point, to Late Prehistoric. Extensive use is made of locally available petrified wood. Sites include some of the highest elevation stone circle habitation sites recorded in Wyoming (48FR7597, 3277m and 48PA3465, 3450m) as well as large open camps with diverse stone tool assemblages. As with the migration corridors, ice patch associated archaeology matches the expectations of our general site probability model well. The co-occurrence of high organic preservation potential with high overall site probability seems to point to exceptionally high elevation archaeological research potential landscapes.

Working at +3200 m, NW Wyoming.





Documentation of both ice patch organics and the adjacent chipped stone landscape provides a unique opportunity to examine high elevation archaeology.



Complex sites including dense artifact shatters and habitation structures.

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