

## CCPA Poster Discussion by Amber Czubernat

The research I did for the 41<sup>st</sup> annual meeting of the Colorado Council of Professional Archaeologists began with Colorado State University graduate student Paul Buckner. I have been working with Paul on gathering data for his master's thesis since January 2019, focusing on the West Branch of the Laramie River watershed in the Medicine Bow Mountain Range of Northern Colorado. The study area consists of 35 surface assemblages that are situated in three ecological zones within this high altitude environment. I chose site 5LR174 to study in greater detail for this project because the site exhibits a high degree of heterogeneity in terms of raw materials in both lithic debitage and tools. It sits at an elevation of 3,258 meters in the subalpine ecological zone, and yielded a total of 151 lithic artifacts. Due to the variation in raw materials present at this site, I chose to utilize Minimum Analytical Nodule Analysis (MANA), because this method in particular can be quite useful for interpretations of hunter-gatherer behavioral patterns. This is done by dividing the assemblage into minimum analytical nodules (MANs) in order to determine individual flint knapping events at a given site.

This research was especially exciting because I had never personally utilized this method before, and it was one large learning process as I began dividing the assemblage into its nodules. I began with the simplest methods of dividing the artifacts into their proper MANs, starting with raw material type and then moving on to comparing color, texture, inclusions, and cortex. Once I was 99% confident that I had my nodules properly sorted, I turned to the portable Raytech UV light to determine whether or not the artifacts truly belonged together in their nodules. This was primarily useful in recognizing the major outliers in the nodules; those that simply did not belong but perhaps the differences that determined this could not be seen by the naked eye. Although this process ended up increasing the number of MANs in my analysis, it also increased my confidence in those MANs and the artifacts that I assigned to them.

Upon confirming my MANs, I began to explore the types of artifacts that were present in each to interpret the tool making behaviors that were occurring in each flint-knapping event. We can see some patterns that began to arise during this analysis, for example in MAN 1.1, which contains a core with several flakes removed from the original parent material. With these larger core reduction flakes, we also see much smaller flakes that I have attributed to the later stages in tool manufacturing. We also have a fragment of a projectile point, which indicates that this may have been a single knapping event, or perhaps multiple tools were created from the debitage in this MAN. The latter interpretation would be more likely if there were a higher quantity of flakes in the nodule, however it is important to remember that this is a surface assemblage and it is likely that quite a few pieces of the puzzle are buried. The main purpose of using MANA was to create a model of raw material movement through the site. It was used to interpret what was created on site and discarded elsewhere, created off-site and discarded on-site, and so on.

These movements can indicate behaviors of hunter-gatherers in a locality that is not in proximity to any apparent local raw material sources. Raw materials that compared well with lab samples of Windy Ridge Quartzite, Troublesome Formation Chert, and Kremmling Chert are abundant in this assemblage as well as other site assemblages in the study area. The exception at 5LR174 is Windy Ridge quartzite, with only two flakes present. There are also three obsidian artifacts that were present at 5LR174: one small core that yielded an unknown source location, and two small flakes that were sourced to two different obsidian source locations in Idaho (Dr. Jason LaBelle, personal communication). It is evident both from the amount of debitage and tools as well as the wide variety of raw material types that the groups that moved through this landscape, and 5LR174 in particular, were highly mobile. They traveled far, and over rough mountain terrain, to obtain the raw materials that they used to create the tools and debitage that we study today.