

Tool-Stone Procurement Patterns in the Northern Mimbres Region

Analysis of the Flaked Stone Debitage and Stone Tools from Twin Pines Village (LA 75947), Catron County, New Mexico

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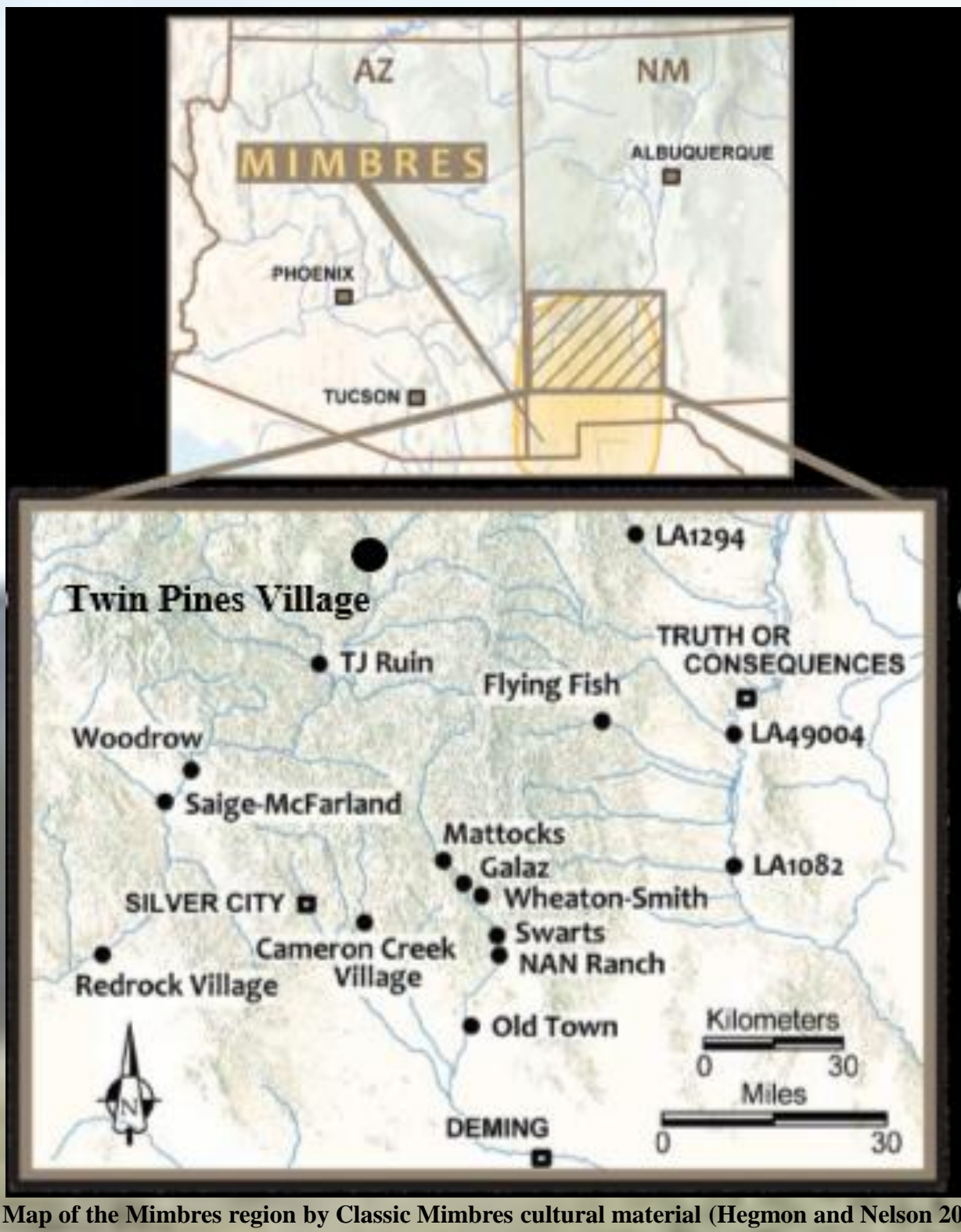


Introduction

The lithic data from Twin Pines Village (LA 75947) can shed new light on stone tool procurement strategies in the American Southwest. Twin Pines Village is a Classic Northern Mimbres site located in Catron County, New Mexico and was occupied from A.D. 1000 to 1130. I investigate how the inhabitants at Twin Pines Village procured and used different lithic raw material sources for specific purposes. I employ an interpretive mass analysis (Ahler 1989), individual flake analysis (Andrefsky 2005), and X-ray fluorescence sourcing (Shackley 2016) to address these variations of lithic procurement behaviors and stone tool variability. These types of analyses allow us to understand general and specific patterns of raw material distributions and lithic reduction processes at the site. For local and regional materials, I address the following points:

- 1) What types of tools were manufactured using specific raw materials?
- 2) What is the likelihood that Twin Pines Village residents manufactured stone tools at the site instead of areas away from the main habitation area?

My analysis ends with a discussion of local and regional interaction within the landscape and tool stone variability between local and regional raw material sources. This analysis lays the groundwork for further lithic analysis concerning procurement strategies dealing with material selection and tool manufacture in the Northern Mimbres region.



Map of the Mimbres region by Classic Mimbres cultural material (Hegmon and Nelson 2003).

Research Objectives

- Identify the tool-stone procurement patterns at the Twin Pines Village during the Classic Mimbres period, A.D. 1000-1130.
- Address procurement strategies and behaviors by examining the stone tool manufacturing processes for expedient, modified, and formal tools.
- Track the provenance of the obsidian stone artifacts and tools (flake debris, bifaces, and projectile points) through X-ray fluorescence spectrometry.

Twin Pines Village

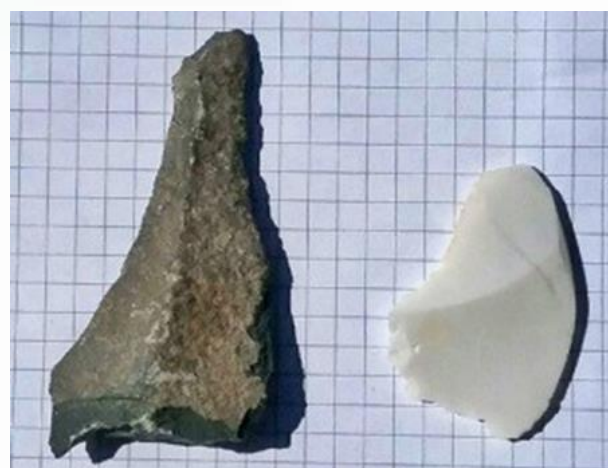


Excavation Unit 4

The lithic assemblage that is the focus of this investigation was recovered from Twin Pines Excavation Unit 4 in 2015. Unit 4 is located in the center of the site by a large ponderosa pine tree that recently collapsed into the excavated unit. This unit is a possible roomblock identified by cobble stone wall alignments, adobe floors, and Classic Mimbres cultural fill. A total of 2,097 flaked debitage fragments from this unit were examined individually. This unit's lithic assemblage was addressed because it produced intact cultural fill with the least amount of disturbance from previous excavations and looters.



Expedient and Formal Stone Tools



(a)



(b)

(a) Expedient Rhyolite and White Chert Utilized Stone Tools

(b) Rhyolitic Cobble Core at Twin Pines



(c)

(c) Modified Obsidian Projectile Point

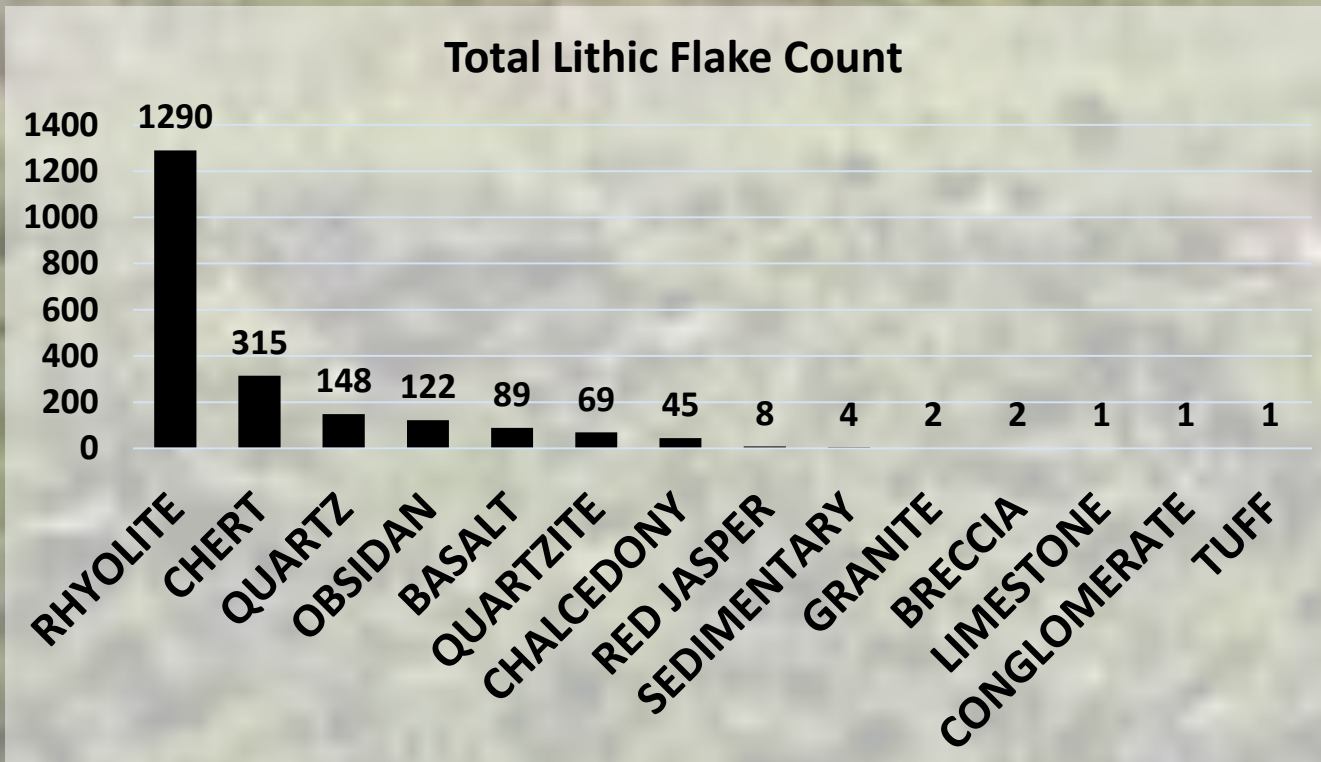


(d)

(d) Formal Obsidian Cosgrove Projectile Point

Examples of expediently utilized flakes, modified projectile point, and formal projectile point recovered from the site.

Mass Analysis of the Lithic Assemblage

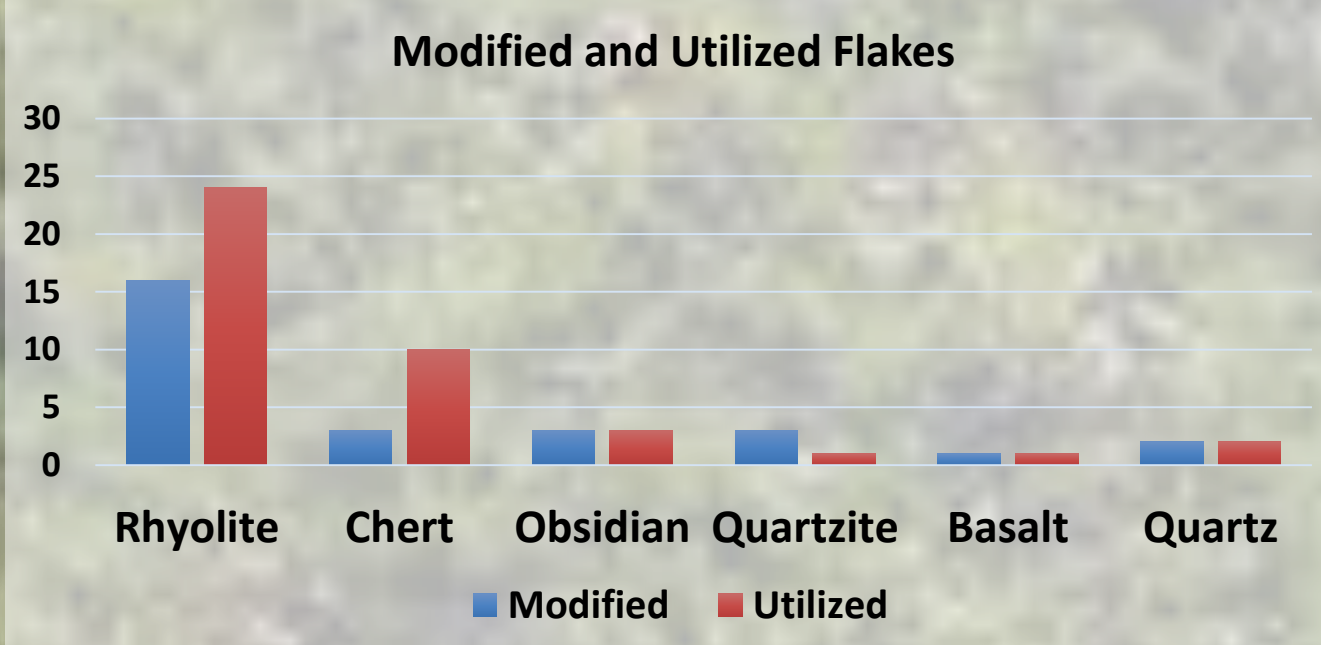


Mass analysis revealed patterns of stone tool manufacturing processes and procurement strategies dealing with local and regional material types.

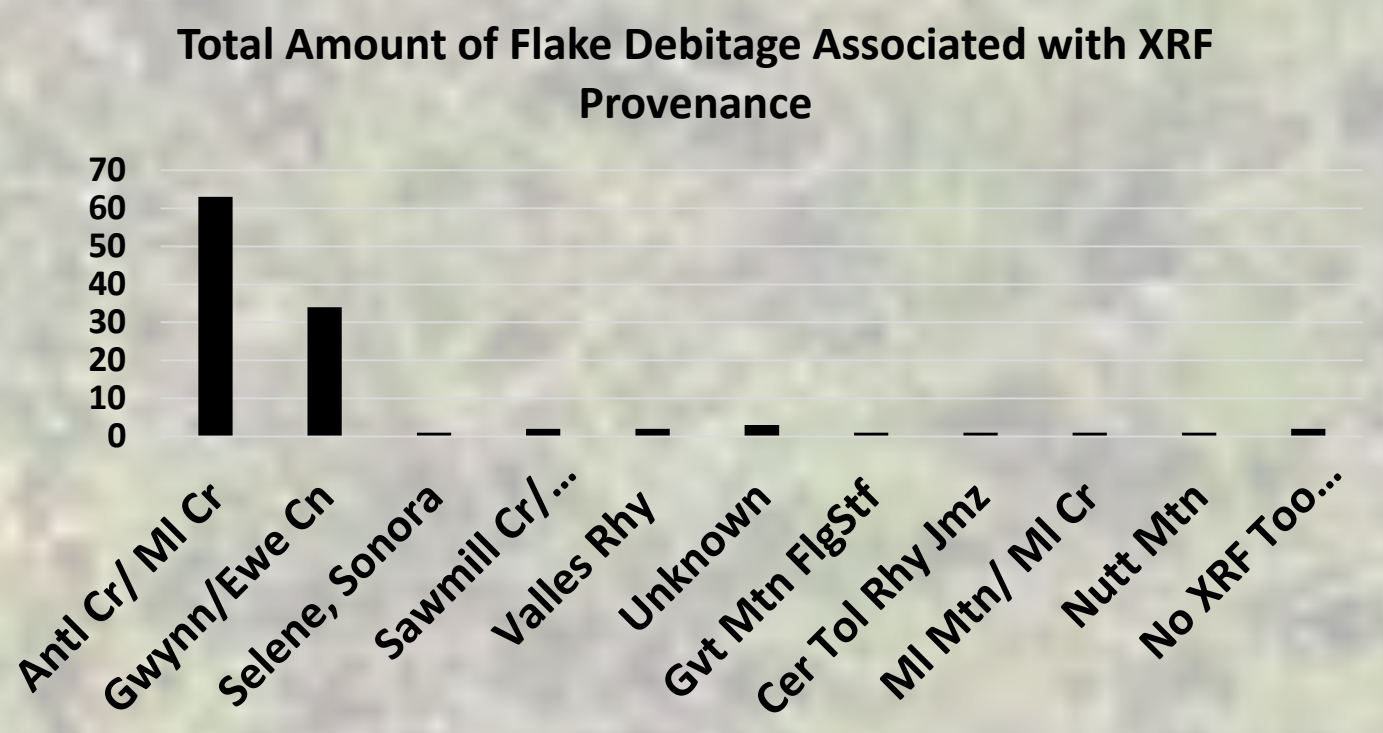
Rhyolitic flaked debitage is the most observed lithic material at Twin Pines Village.

Rhyolite is the most used material source to manufacture expediently modified and utilized flake stone tools.

Larger flake sizes showing early flake reduction stages address local procurement strategies, whereas smaller flakes in less abundance relate to regional procurement strategies (Eerkens et al. 2007).



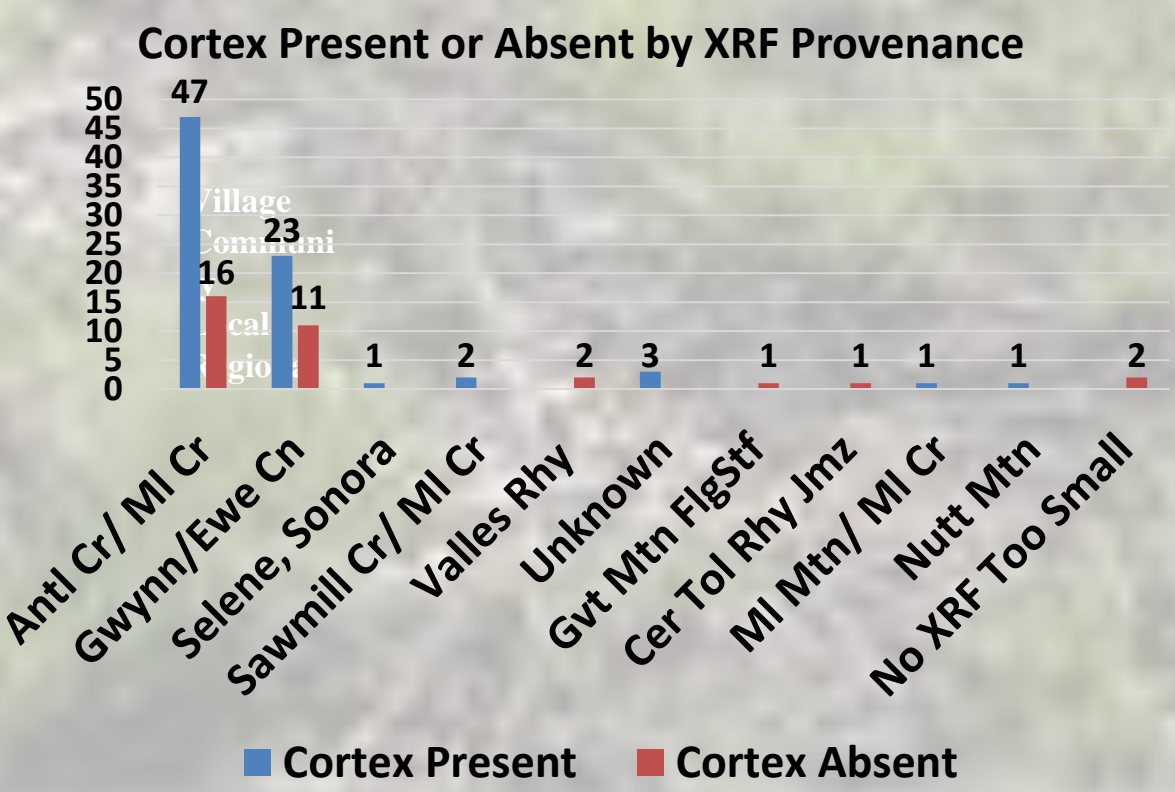
XRF Analysis of Obsidian Debitage



XRF analysis of individual obsidian flakes reveals that most of the raw material was recovered from the Antelope Creek/ Mule Creek and Gwynn/Ewe Canyon obsidian sources.

What this suggests is:

- 1) The knappers' stone tool manufacturing process produces flakes of relatively the same size and weight from the obsidian sources.
- 2) The basic attributes of flakes produced from source materials do not differ in significant ways.
- 3) The greater amount of flaked debitage from Antelope Creek/ Mule Creek with higher amounts of cortex suggests that obsidian is being collected or traded from this source, brought back into the site, and manufactured into formal stone tools.



Projectile Points by Source Provenance



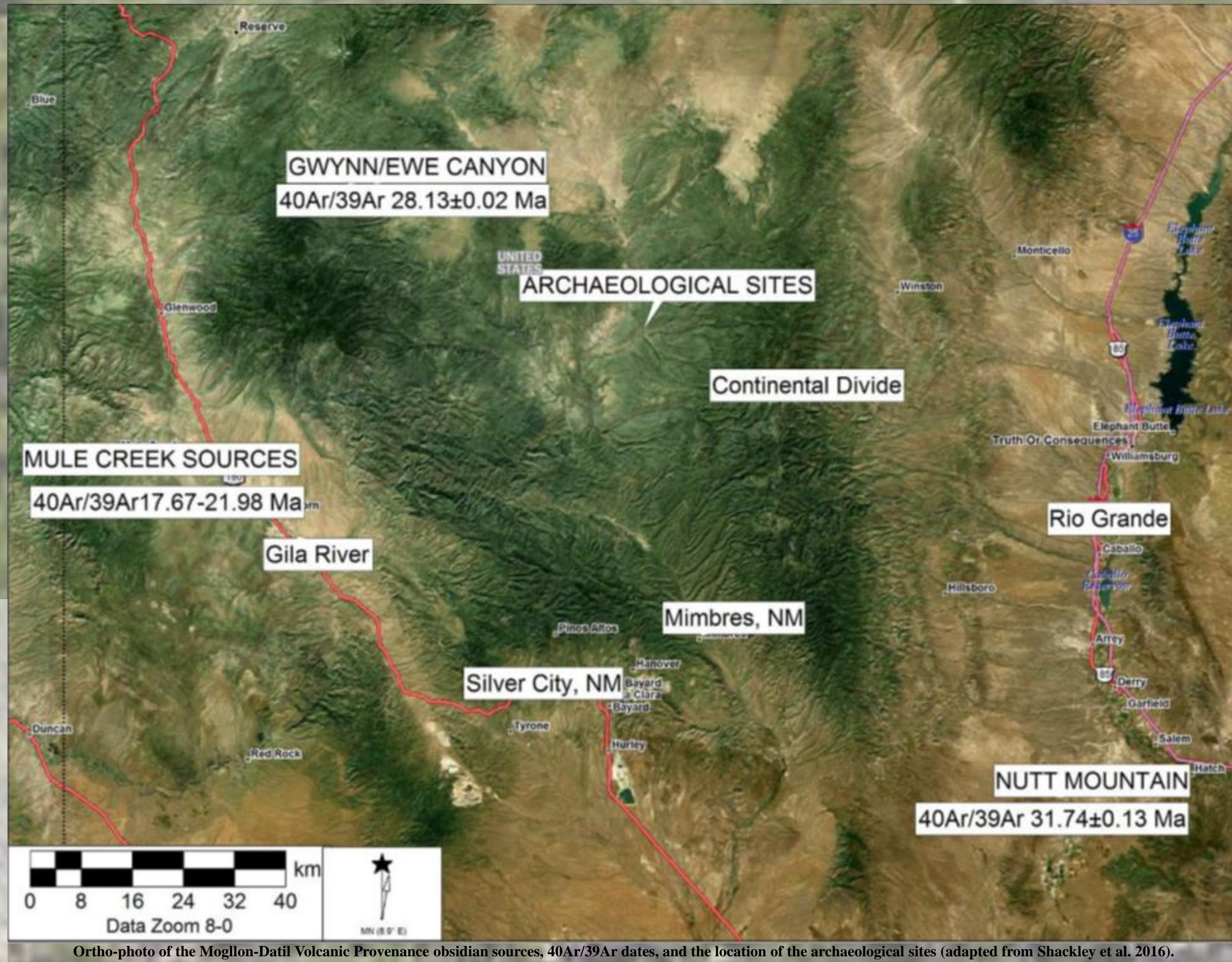
The 15 obsidian projectile points recovered from Unit 4 have been analyzed by X-ray fluorescence spectrometry (Shackley 2016). The results have shown that 14 out of the 15 points were sourced to Antelope Creek/Mule Creek obsidian source. There was only one point sourced to Gwynn/Ewe Canyon obsidian source. The distances from Antelope Creek/Mule Creek is approximately 80 km from Twin Pines, whereas Gwynn/Ewe Canyon is only roughly 40 km away. This analysis has traced where the obsidian points source origin is located addressing regional procurement strategies for formal stone tool material.

The bifaces recovered from Unit 4 all share the same obsidian source provenance from Antelope Creek/Mule Creek. There are 4 bifaces out of the 8 that are broken pieces of a projectile point (tip, body, base). The other 4 bifaces are in the edged reduction, preform, and refined bifacial thinning stages. There are 2 bifaces that have 20%-50% cortex. The obsidian source of these bifaces is over 80 km away. The bifaces are all smaller than 5cm in length and width. The bifaces with cortex show that there was manufacturing of projectile points at Twin Pines. The importance of this analysis has shown that small obsidian nodules were being collected to manufacture small projectile points at Twin Pines Village.

Bifaces by Source Provenance



Location of Obsidian Quarries in Association with theTwin Pines Village Obsidian Assemblage



Summary of Research

This analysis reveals the types of materials procured from local and regional sources for expedient, modified, and formal stone tools. Rhyolitic raw stone material was procured more than any other material type. The residents at Twin Pines Village were selecting most of their expedient stone tools from local sources surrounding the site. For formal stone tools, such as projectile points, the procurement strategy shifted from local "opportunistic" strategies to something more embedded or through trade. The majority of obsidian flake debitage, all the bifaces, and 14 points were traced back to Antelope Creek/Mule Creek over 80 km away. The obsidian points and bifaces are small and may have been procured from secondary depositions when collecting resources in the region but to what extent is unknown. There must have been major influences and interactions with neighboring villages to the west. Trade must have been a common activity among the Northern Mimbres people for resources uncommon in their area. This research has contributed to the knowledge of lithic procurement strategies and tool production at a Classic Mimbres site, in the Northern Mimbres region.

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