Journal of Archaeological Science 43 (2014) 21–30

Contents lists available at ScienceDirect

Journal of Archaeological Science

journal homepage: http://www.elsevier.com/locate/jas

Paleoindian rock art: establishing the antiquity of Great Basin Carved Abstract petroglyphs in the northern Great Basin

Emily S. Middleton [a,*], Geoffrey M. Smith [b], William J. Cannon [c], Mary F. Ricks [d]

[a] ASM Affiliates, Inc., 10 State Street, Reno, NV 89501, USA
[b] Great Basin Paleoindian Research Unit, Department of Anthropology, University of Nevada, Reno, 1664 No. Virginia Street/MS0096, Reno, NV 89557, USA
[c] Bureau of Land Management, Lakeview District, 1301 South G Street, Lakeview, OR 97630, USA
[d] Portland State University, 8106 SW 187th, Beaverton, OR, USA

ARTICLE INFO

Article history:
Received 19 October 2013
Received in revised form
10 December 2013
Accepted 11 December 2013

Keywords:
Great Basin
Paleoindians
Rock art

ABSTRACT

One of the principal ways that researchers date archaeological sites is by using temporally diagnostic projectile points as index fossils; however, this practice has not been widely employed to date rock art sites. We use this approach here to test the hypothesis that the Great Basin Carved Abstract (GBCA) petroglyph style found in the northern Great Basin was produced by Paleoindians. Using frequencies of projectile points at 55 GBCA sites, we demonstrate that Paleoindian points are significantly over-represented there relative to their occurrence on the general landscape, providing evidence that Great Basin populations produced rock art sometime during the Terminal Pleistocene/Early Holocene (TP/EH), ~12,500–8000 radiocarbon years ago. Additionally, we examine several environmental variables at GBCA sites and propose a model of Paleoindian land-use in the northern Great Basin that highlights seasonal visits to uplands to procure geophytes (i.e., root crops).

1. Introduction

Our ability to reconstruct prehistory is dependent on materials preserved in the archaeological record. In the Great Basin, where most sites occur in open-air settings with limited potential for organic preservation, remains are biased towards durable items (e.g., flaked stone artifacts). Such artifacts have allowed researchers to investigate some aspects of Paleoindian behavior, including technological organization (Duke and Young, 2007; Goebel, 2007; Smith, 2007), during the terminal Pleistocene/early Holocene (TP/EH), ~12,500–8000 radiocarbon years before present (^{14}C B.P.) (~14,650–8875 calendar years ago [cal B.P.]).[1] While other artifact types, including perishable technology (Barker et al., 2012; Connolly and Barker, 2004) and subsistence residues (Hockett, 2007; Rhode and Louderback, 2007), have also informed our understanding of Paleoindian lifeways, their paucity at early sites limits their utility in developing behavioral models. Although petroglyphs, like flaked stone artifacts, are not subject to rapid decomposition like organic remains, they have traditionally not figured prominently in treatments of Paleoindian lifeways. Many researchers eschew rock art because of the difficulty in assigning it to particular time periods (Woody and Quinlan, 2009). In this paper, we present the results of our analysis of 55 archaeological sites in the northern Great Basin that contain a particular style of petroglyphs – Great Basin Carved Abstract (GBCA) – that some researchers (Cannon and Ricks, 1986, 2007; Ricks, 1999; Ricks and Cannon, 1993) suggest was produced by Paleoindians. Using associated temporally diagnostic projectile points as index fossils, we demonstrate that Paleoindian points are significantly over-represented at GBCA sites relative to their occurrence on the general landscape, suggesting that early populations produced the petroglyphs. We also present the results of our analysis of two environmental variables – elevation and vegetation – of GBCA sites and argue that current models of Paleoindian lifeways do not fully account for how and why early groups used uplands in the region.

2. Background

2.1. The terminal Pleistocene/early Holocene in the northern Great Basin

Although variable, conditions during the TP/EH were generally cooler and moister than today (Grayson, 2011). Shallow lakes and

* Corresponding author. Tel.: +1 775 324 6789.
E-mail addresses: emiddleton@asmaffiliates.com (E.S. Middleton), geoffreys@unr.edu (G.M. Smith), b1cannon@blm.gov (W.J. Cannon), ricksmf@gmail.com (M. F. Ricks).

[1] Most of our radiocarbon dates were converted to approximate calendar years and *vice versa* using Appendix A in Grayson (2011). All conversations were made to the nearest 25-year interval.

0305-4403/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jas.2013.12.006

marshes occupied many valley floors and provided abundant resources (Goebel et al., 2011; Madsen, 2007). As the early Holocene (10,000–8000 ^{14}C B.P.; 11,475–8875 cal B.P.) unfolded, warmer conditions and decreased precipitation altered the landscape (Grayson, 2011). The vertical distribution of some vegetation communities, such as juniper and conifer woodlands, shifted in response to these changes (Wigand and Rhode, 2002). For example, at Patterson Lake in northeastern California (~9000 feet above sea level [ASL]), western pine did not become common until after ~7000 ^{14}C B.P. (~7850 cal B.P.) and at Dead Horse Lake, Oregon (~7400 feet ASL), a mixed community of subalpine fir/western pine was replaced by an exclusively western pine forest by ~7900 ^{14}C B.P. (~8725 cal B.P.) (Minckley et al., 2007). Other vegetation communities may have been less affected during the early Holocene. At Bicycle Pond, Oregon (~5800 feet ASL), for example, sagebrush-grass steppe has characterized that location since ~8500 ^{14}C B.P. (~9500 cal B.P.) (Wigand and Rhode, 2002) and a sagebrush-grassland community persisted at Fish Lake, Oregon (~7400 feet ASL) throughout much of the early Holocene (Mehringer, 1985). Geophytes – perennial plants with underground bulbs (e.g., bitterroot, biscuitroot, yampa, wild onion) – whose spatial distributions are influenced more by soil characteristics than climatic conditions and are relatively resistant to climate fluctuations (Boeken, 1989; Dafni et al., 1981; Housley, 1994; Prouty, 1994), may have been found in the same general areas as today although their abundance within those areas likely fluctuated (Dave Rhode, personal communication, 2013; Housley, 1994; Prouty, 1994; Ricks, 1999; Schlessman, 1984).

Current data suggest that humans arrived in the northern Great Basin ~12,000 ^{14}C B.P. (~13,850 cal B.P.) (Jenkins et al., 2012). TP/EH lifeways are generally portrayed as having included frequent, distant residential moves with wetlands serving as centers of settlement and subsistence activities (Elston and Zeanah, 2002; Goebel et al., 2011; Jones et al., 2003; Smith, 2010). Such views are based on multiple lines of evidence: (1) most diagnostic Paleoindian artifacts (stemmed and concave-base projectile points, crescents) (Fig. 1) are associated with TP/EH wetlands (Duke and Young, 2007; Jones et al., 2003; Smith, 2007); (2) early sites exhibit high tool-to-debitage ratios (Oviatt et al., 2003; Schmitt et al., 2007); (3) source provenance data suggest that artifacts were transported substantial distances (Jones et al., 2003; Smith, 2010); (4) architectural and storage features are essentially nonexistent (Elston and Zeanah, 2002; Jones and Beck, 1999); and (5) Paleoindian tools appear to have been multifunctional (Beck and Jones, 2009; Lafayette and Smith, 2012). Direct evidence of Paleoindian subsistence is limited, but a variety of resources including large and small game, birds, fish, and wetland plants were likely consumed (Eiselt, 1997; Hockett, 2007; Napton, 1997; Pinson, 2007). Indirect evidence for subsistence pursuits, such as site location and lithic technology, suggest that hunting near wetlands was common (Elston and Zeanah, 2002). Although some notable exceptions, including Bonneville Estates Rockshelter (Goebel, 2007), Last Supper Cave (Layton and Davis, 1978), and Smith Creek Cave (Bryan, 1979) exist, substantial open-air concave-base and stemmed point sites are generally not found at higher elevations (Grayson, 2011; Jones et al., 2003; Taylor, 2002).

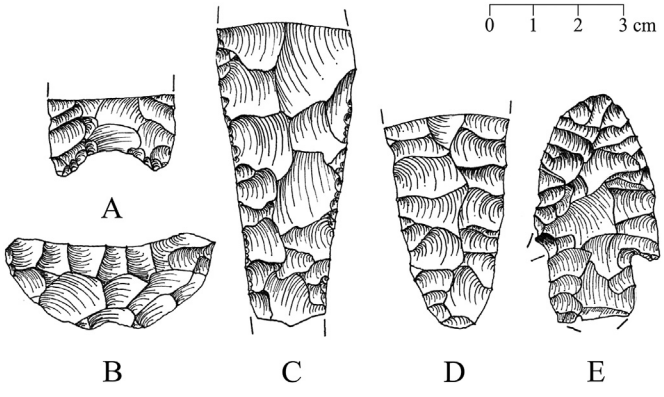

Fig. 1. Diagnostic Paleoindian artifacts from the northern Great Basin (redrawn from Smith, 2007): (A) concave-base point; (B) crescent; and (C–E) stemmed points.

2.2. The Great Basin Carved Abstract style

Rock art has traditionally not figured prominently in treatments of Paleoindian lifeways in the Great Basin because direct dating techniques (some of which remain experimental) are not widely applied (Quinlan, 2007; Woody and Quinlan, 2009; see Benson et al., 2013; Ritter et al., 2007; Whitley, 2013 for recent efforts). Because many researchers assume that we cannot date petroglyphs, they are often not assigned to particular cultural periods. Despite this issue, however, a few researchers have argued that some petroglyphs date to the TP/EH. For example, Cannon and Ricks (1986), Ricks (1995, 1999), Ricks and Cannon (1993) suggest that Paleoindians produced a distinctive style of petroglyphs in the northern Great Basin. The style, which they termed Great Basin Carved Abstract (GBCA), was initially defined at Long Lake, Oregon (see below) and additional discoveries of similar panels at 54 other sites indicate that it occurs throughout the northern Great Basin (Fig. 2). Cannon and Ricks, who have recorded the majority of GBCA sites, argue that the petroglyph style differs from other styles in the Great Basin in three ways:

(1) GBCA panels are distinguished by the depth of carving (up to ½″ or more). Deeply-incised GBCA panels are best described as bas- or low-relief carvings and are clearly different from the lightly pecked designs characteristic of other styles;
(2) GBCA panels are highly or completely revarnished, returning to the same color and texture as the surrounding unmodified rock surface. This attribute is different than other styles, which take advantage of the difference in color between the darker overlying varnish and lighter underlying rock; and
(3) GBCA panels lack “white space”: panels are often entirely filled with highly integrated design elements of curvilinear and rectilinear abstract lines, circles, and dots (Fig. 3). This use of space gives the panels an aspect of composition, rather than a collection of isolated elements that often characterizes panels containing other styles.

These attributes have led Cannon and Ricks and others (e.g., Ritter et al., 2007) to conclude that GBCA panels are distinctive enough to warrant a separate stylistic classification.

Several lines of evidence suggest that GBCA petroglyphs are older than other styles of rock art in the region. GBCA panels are always the most revarnished panels at sites containing multiple styles, and when GBCA petroglyphs are associated with other styles, GBCA panels consistently underlie them (Cannon and Ricks, 2007). Both facts provide evidence for the relative antiquity of the GBCA style; however, they suggest only that GBCA petroglyphs predate other styles by some unknown amount of time. Evidence for the absolute age of GBCA rock art is found at Long Lake, Oregon (35LK514), a rock art concentration along a 2.5-mile-long basalt rim. There, two GBCA panels were discovered partially buried beneath the current ground surface (see Fig. 3). Excavations revealed that the panels extend 94 cm below the ground surface; from ~70 to 90 cm below the surface, a layer of Mazama tephra