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Reconsidering the potential role of saline springs in the Paleoindian occupation of Sandy Springs, Adams County, Ohio

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ABSTRACT

The potential role of saline springs in Paleoindian settlement models has been espoused for over 50 years. An early example of this adaptive strategy was proposed in 1973 by Roger Cunningham in his formative discussion of the Paleoindian Sandy Springs site in Adams County, Ohio. Cunningham argued that saline springs located among local sand dunes acted as a significant draw for migrating game animals and, subsequently, the Paleoindian hunters that pursued them. Despite being widely accepted and repeated in the literature, the claim of saline-enriched groundwater at Sandy Springs has never been evaluated quantitatively. To assess the accuracy of Cunningham's claim, this study completed electrical conductivity and pH analysis of surface water and sediment samples within a 20-km radius of Sandy Springs. Testing failed to identify water samples >320 ppm total dissolved solids, a result far below established thresholds for brackish or brine classification. Underlying local bedrock geology also is not conducive for the presence of saline springs, and no mention of salt licks, commercial salt wells, or animal trails has been identified in the literature for Adams County, Ohio. Sediment samples from sand dunes locations previously argued to contain saline springs at Sandy Springs also failed to yield statistically different pH values than those from non-dune, alluvial contexts. Overall, the reported presence of saline springs at Sandy Springs could not be verified by geochemical data. Instead, it is suggested in this article that saline groundwater was not a principal factor in determining Paleoindian occupation of the site. Alternative explanations for site occupancy include the possible presence of rare resources associated with a sand prairie ecosystem and the potential that Sandy Springs was positioned along an early trail system connecting the upper Ohio Valley with the Tennessee and Cumberland Valleys.

1. Introduction

In the inaugural 1973 issue of *Archaeology of Eastern North America*, Roger Cunningham was among the earliest to suggest that the location of natural saline springs was a significant draw for late Pleistocene herbivores and the Paleoindian hunters who pursued them in the upper Ohio Valley (Cunningham, 1973: 121; see also Rolingson, 1964: 72). Cunningham referred to the proximity of Paleoindian artifacts, saline springs, and the remains of Pleistocene megafauna such as mammoth (*Mammut americanus*) and bison (*Bison antiquus*) at northern Kentucky sites such as Big Bone Lick and Upper and Lower Blue Licks (Hansen, 1983, 1995; Rolingson, 1964; Schultz et al., 1963) as evidence for this adaptive land-use strategy. As additional support for this pattern, Cunningham further discussed several newly discovered upper Ohio Valley sites that he claimed yielded Paleoindian material in association with saline springs (Cunningham, 1973: 120–122). Since 1973, a purported correlation between saline waters and Paleoindian sites in the eastern U.S. has become widely accepted and embedded in the literature (e.g., Anderson and Gillam, 2000: 44; Brown, 1999: 115, 2010: 395; Dincauze, 1993; Maggard and Stackelbeck, 2008: 154; O'Brien, 1996: 446–451; Smith, 1990a: 98–111, 1990b: 244; Tankersley, 1996: 28, 1998: 14).

Most prominent among these "new" sites discussed by Cunningham was Sandy Springs in southeastern Adams County, Ohio (Fig. 1). Based on amateur collector data, Cunningham characterized Sandy Springs as a dense concentration of Paleoindian material distributed among relict sand dunes and saline springs (Cunningham, 1973: 122). In 1994, Mark Seeman and colleagues expanded upon Cunningham's description by offering various hypotheses concerning site age and function based on their own analysis of local artifact collections. Notable was the confirmation of at least 98 Paleoindian points from the site (Seeman et al., 1994: 81). Repeated occupation throughout the Paleoindian period is

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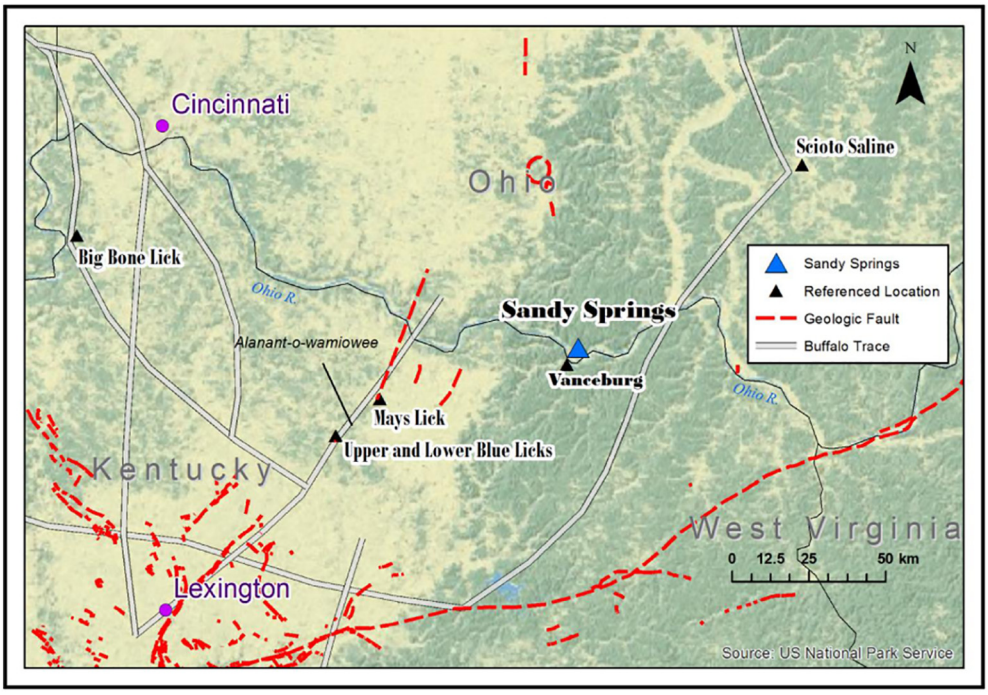

Fig. 1. Geographic location of Sandy Springs Paleoindian site and locations referenced in text. Geologic fault locations based on Baranoski, 2013, and the Kentucky Geological Survey, 2016. Please note that a small geologic fault exists at the location of the Upper and Lower Blue Licks symbol. Buffalo trace locations based on Jakle, 1969: 690. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

suggested by an inventory of Clovis[1] (n = 14), Cumberland (n = 15), and lanceolate (n = 34) point styles. A high frequency of intact points implied to Seeman et al. (1994: 81) that Sandy Springs was neither a primary tool production area nor multi-activity base camp, but instead reflected a series of temporary hunting-collecting stations.

In Seeman et al.'s, 1994 article, Cunningham's earlier claim of saline water at Sandy Springs was repeated and a personal communication was cited suggesting that springs recharge "from clay seams among or immediately below the dunes" (Seeman et al., 1994: 79). In the same passage, Seeman et al. refers to an early nineteenth century salt works across the Ohio River in Vanceburg, Kentucky, as further support of the claim of high water salinity in area streams. Finally, they cite historical reports of a natural ford on the Ohio River, just upriver from Sandy Springs, as a favorable crossing point for both humans and migrating game (Seeman et al., 1994: 79; see also Seeman and Prufer, 1982: 157).

The report of saline springs has played a significant role in Cunningham's, and later Seeman et al.'s, interpretation as to why Sandy Springs was occupied repeatedly during the Paleoindian Period. The presence of saline waters is thought to have attracted migrating game, especially herbivores, which could easily ford the Ohio River near Sandy Springs. Along the hummocky dune surface, it was suggested that Paleoindian hunters found excellent vistas of the surrounding landscape for game monitoring and topographic depressions in which hunters could seek concealment (Cunningham, 1973: 120–122; Seeman et al., 1994: 83–84). This elegant narrative, based largely on the supposition of saline springs, has important implications for many extant eastern U.S. Paleoindian adaptive land-use models, prey choice strategies, and mobility patterns (e.g., Anderson, 2013; Broster et al., 2013; Cannon and Meltzer, 2004, 2008; Kelly and Todd, 1988; Lepper and Meltzer, 1991; Meltzer and Smith, 1986; Smallwood, 2012; Surovell and Waguespack, 2009; Tankersley, 1990; Waguespack and Surovell, 2003). For example, this perspective posits Paleoindians at Sandy Springs as 'specialized hunters' (e.g., Kelly and Todd, 1988: 240; Tankersley, 1990) reducing risk by revisiting a landscape characterized by predictable, and abundant, animal resources. This incorporates components of both 'place-oriented' and 'technology oriented' strategies as the repeated reoccupation of Sandy Springs (place-oriented) is thought to have supported a specialized hunting lifestyle (technology-oriented). A similar argument has been made for the Paleoindian occupation of Sheridan Cave, Huron County, Ohio, where Redmond and Tankersley (2005: 524) suggested periodic revisits to the sinkhole/cave to scavenge, or killed, entrapped animals.

The claim of saline waters at Sandy Springs largely has been accepted in the Paleoindian literature (e.g., Gramly and Funk, 1990: 16; Lepper, 1986: 53; Lothrop and Cremeens, 2010: 121; Smith, 1990a: 244; Tune, 2016: 311), despite the fact that ionic concentrations of local water sources have not been directly measured through gravimetric or conductivity means. The origin of Cunningham's initial claim is unclear but he cites an extended passage from Stout et al. (1932: 11) on the importance and location of Ohio brines and highlights the fact that several local stream names are suggestive of hypersalinity such as Sulphur Creek and Long Lick Creek in Ohio and Salt Lick Creek in Kentucky (Cunningham, 1973: 122). Close review of the Stout et al., passage, however, suggests that the authors only reference salt sources in eastern, not western, Ohio. Moreover, nowhere in their volume do the authors list Adams County, Ohio, as containing saline springs or commercial salt wells.

Given this ambiguity, the purpose of this research was to evaluate the long-held assumption that the Sandy Springs landscape contains natural saline waters of such concentration as to have attracted species pursued by late Pleistocene hunters. This study included review of relevant geological literature on potential saline groundwater sources and identification of historical passages that mention regional brackish waters or salt production, including information regarding the salt works noted at Vanceburg, Kentucky. Finally, electrical conductivity testing of surface water and sediment, and pH testing of sediment from dune

[1] In the original publication, Seeman et al. (1994: 81) partitioned "Clovis" point taxon into Clovis and Gainey styles. Recent studies, however, have questioned the utility of the "Gainey" taxon suggesting it is not based on empirical or quantitative evidence (e.g., Eren et al., 2011; Eren and Desjardine, 2015: 109–110). For this study, the Clovis (n = 2) and Gainey (n = 12) inventory was combined and labeled as Clovis.