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Faunal remains from an archaic period cave in the Southeastern United States

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ABSTRACT

Ancient Native American use of caves in the Eastern Woodlands occurred throughout the entire span of regional prehistory; however, the ways that these natural features were used varied considerably over time. To date only 25 cave sites containing deposits dated to the Archaic period (ca. 10,000–3000 B.P.) are recorded in the state of Tennessee, representing just 0.4% of the total known Archaic sites. In 2014 the authors conducted a salvage operation, bucket auger survey, and limited testing at the site of Black Cat Cave (40RD299) in Rutherford County, Tennessee to assess looting damage and assist in the installation of a security gate across the cave entrance. These investigations identified Black Cat Cave as the site of significant mortuary activity during the Middle Archaic (ca. 6460–6360 B.P.), and resulted in the recovery of rare Archaic faunal data from a cave setting. Analysis of faunal materials from the site allows us to add important new information to our understanding of ancient Native American landscape use in the Eastern Woodlands during the mid-Holocene.

1. Introduction

Caves and rockshelters of the Eastern Woodlands were used by people throughout the early- and mid-Holocene for a variety of reasons including for shelter, cemeteries, ritual activity such as the creation of dark-zone art, and for mining of natural resources and minerals (Hubbard and Barber, 1997; Barrier and Byrd, 2008; Crothers and Drooker, 2001; Crothers et al., 2002; Faulkner, 1986; Franklin, 1999; Franklin, 2001; Franklin, 2008; Franklin and Simek, 2008; Griffin, 1974; Munson and Munson, 1990; Pritchard, 2008; Sherwood et al., 2004; Simek et al., 2012; Simek et al., 2001; Simek and Cressler, 2005; Simek et al., 2004; Simek et al., 2008; Simek et al., 1998; Tankersley, 1996; Watson, 1969; Watson, 1974). The unique preservational conditions within caves increase the probability that the archaeological record survives and can be recovered by archaeologists. Unfortunately, historic and modern actions including recreational spelunking and illicit looting of archaeological deposits have severely impacted many cave sites, including the archaeological deposits, which in turn has limited our understanding of how these sites fit into the overall picture of ancient landscape use. Recent research at a cave in Middle Tennessee yielded data on significant prehistoric activities that had been previously unknown.

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Many archaeological cave sites in the Eastern Woodlands are located in upland areas at higher elevations (approximately 600 m–1500 m above mean sea level [amsl]). One of the unique features of the Black Cat Cave site (40RD299) is its location in a sinkhole in Rutherford County, Tennessee within the rolling peneplain of the Inner Central Basin physiographic province (Fig. 1). Today the area surrounding Black Cat Cave is situated at approximately 167–179 m amsl, and drains northeast into the Stones River watershed. The dense Ridley limestones that comprise the bedrock of much of the Inner Central Basin belong to the Ordovician Stones River Group, which measure upwards of 45 m thick (Galloway, 1919). Millennia of erosion and weathering of this karst surface have resulted in the formation of thousands of sinkholes and underground drainages throughout Rutherford County.

During the prehistoric period in the Southeastern United States caves were locations where people created art (Simek and Cressler, 2005), procured raw materials and minerals (Franklin, 1999; Franklin, 2001; Franklin, 2008; Franklin and Simek, 2008; Moore et al., 2014; Simek et al., 1998), and buried their dead (Claassen, 2010; Sherwood and Chapman, 2005; Watson, 1969). While cave use in the Eastern Woodlands extends back to the Pleistocene/Holocene transition (e.g. Griffin, 1974; Sherwood et al., 2004), evidence for cave use in the region during the Archaic period (ca. 10,000–3000 B.P.) is relatively sparse. Although it falls outside the scope of the present research to compile a comprehensive directory of Archaic cave occupations in the Eastern Woodlands, data from the Tennessee Division of Archaeology's (TDOA) official Tennessee State Site File (TSSF) provides a state-level proxy to illustrate the scarcity

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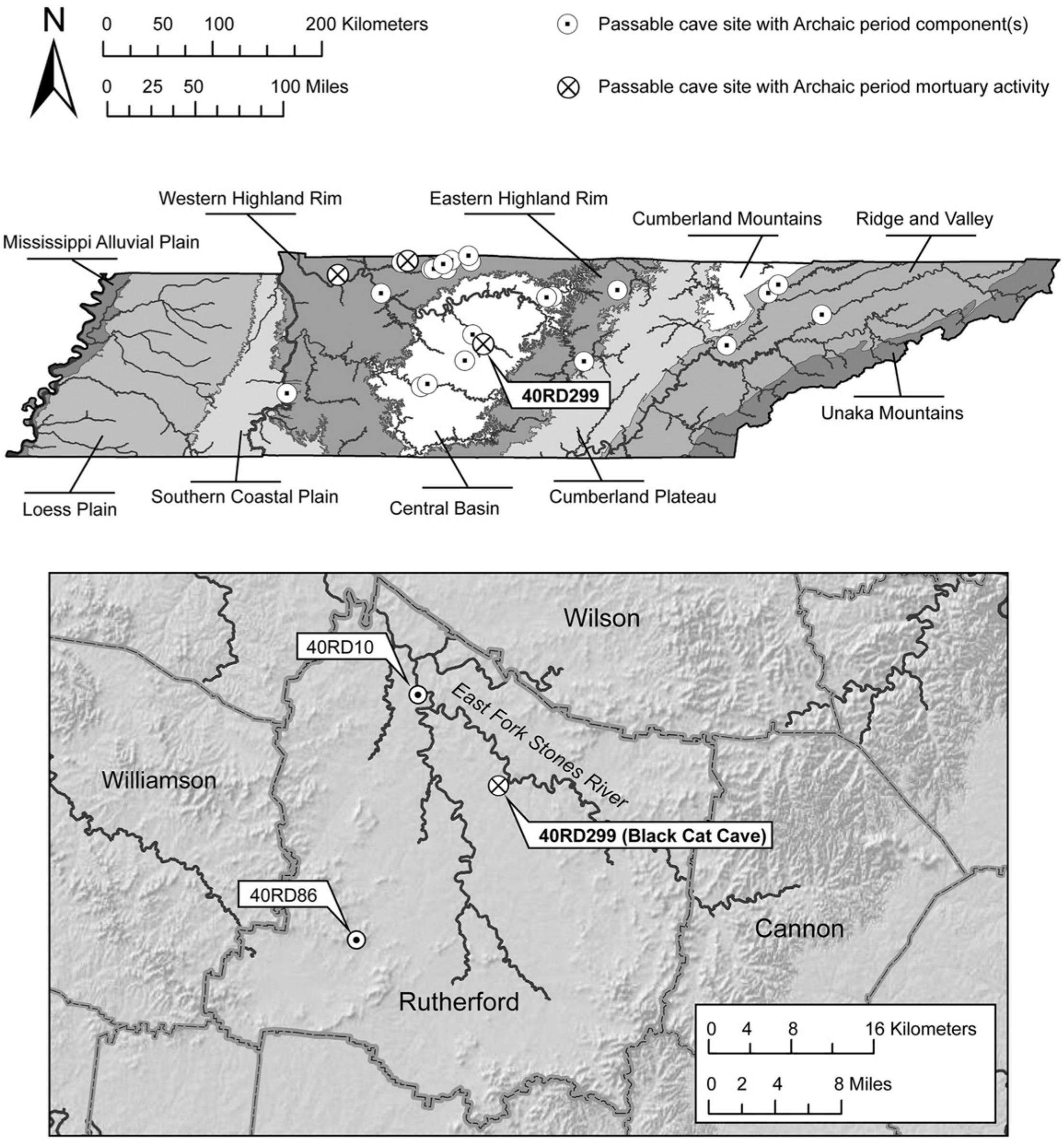

Fig. 1. Location of Black Cat Cave and other caves with Archaic period components within Tennessee's physiographic provinces and in Rutherford County.

of Archaic cave use. As of March, 2016 the TSSF includes entries for 5698 sites in Tennessee exhibiting Archaic components, and 166 passable caves containing prehistoric archaeological deposits. These data sets overlap in just 25 instances where Archaic components have been documented within passable caves (see Fig. 1).

Although there are approximately 20 passable caves in Rutherford County (Barr, 1961; Matthews, 1971), the TSSF records archaeological deposits in only three of those locales: Black Cat Cave (40RD299), Snail Shell Cave (40RD86), and site 40RD10 (see Fig. 1). According to the TSSF, Snail Shell Cave yielded two projectile points/knives diagnostic to the Late Archaic, while inspections at Site 40RD10 identified several fire pits and prehistoric materials from throughout the prehistoric sequence; however, neither site has been subjected to formal archaeological testing and are known only from pedestrian reconnaissance and informant reports.

Given the limited data on Archaic cave use in both Rutherford County and throughout the state of Tennessee, the materials recovered from Black Cat Cave take on new importance for our understanding of the Archaic period in Tennessee and the Eastern Woodlands. Here we present background information on this previously unpublished site including both the historic use and prior archaeological investigations. We then summarize the faunal assemblage from the site and the context of that data set and compare it to other Archaic period cave sites with faunal assemblages, in order to discuss what these data reveal about human-animal interactions and landscape use in the Eastern Woodlands during the mid-Holocene.

2. Black Cat Cave

The main entrance to Black Cat Cave is located along the eastern wall of a karst sinkhole less than 50 yards off of busy US Highway 231 in Murfreesboro, Tennessee (Fig. 2). The sinkhole is approximately 45 m (148 ft.) by 21 m (69 ft.) wide and 3.6 m (12 ft.) deep, and is situated within a small tract of land that was donated to the City of Murfreesboro by the U.S. Department of Veterans Affairs in 1971. At one time the cave entrance would have measured about 21 m wide (69 ft.) and 2 m (6.6 ft.) high, and opened into a single room measuring between 1.2 m (4 ft.) and 2.4 m (7.8 ft.) high, although it has been altered by historic activity (see below). The property is managed by the City of

Fig. 2. Sinkhole that contains the main entrance to Black Cat Cave.

Murfreesboro Parks and Recreation Department, who until 2014 were unaware of the prehistoric component.

Although the front portion of the cave is a naturally dry environment, an active underground stream channel flows through the rear of the cavern (Fig. 3). From the main cave chamber the stream flows northeast along a dark zone passageway for approximately 300 m (984 ft.) before emerging above ground at the headwaters of an unnamed first order stream which flows into the East Fork of the Stones River approximately 1.12 km (0.69 miles) northeast of the site.

2.1. Historic use of the cave

Black Cat Cave plays a role in local oral histories going back to the Civil War, when local informants interviewed by the authors report that farmers used the site to hide their livestock from Union troops. According to one account, the landowner at the time of the Civil War had invented a perpetual motion machine to power a mechanised thresher, which he hid in the cave to protect it from Yankee troops (Davis, 2005). To date no evidence of this machine or other Civil War-era remains have been found in the cave.

During the 1920s and 1930s Black Cat Cave was used first as a speakeasy, and later as a dance cave (Tucker 2013; Douglas 2007). In the late 1920s the proprietors of the cave constructed rock and concrete block walls that completely enclosed the entrance, and divided the interior space into three rooms. The middle room served as the kitchen, and was paneled in cedar. The main room to the north served as the restaurant and dance hall, and had a hardwood floor underlain by a concrete slab. A small raised platform in the northeast corner of the main room was used as a band stage. Fireplaces were built in the main room and kitchen.

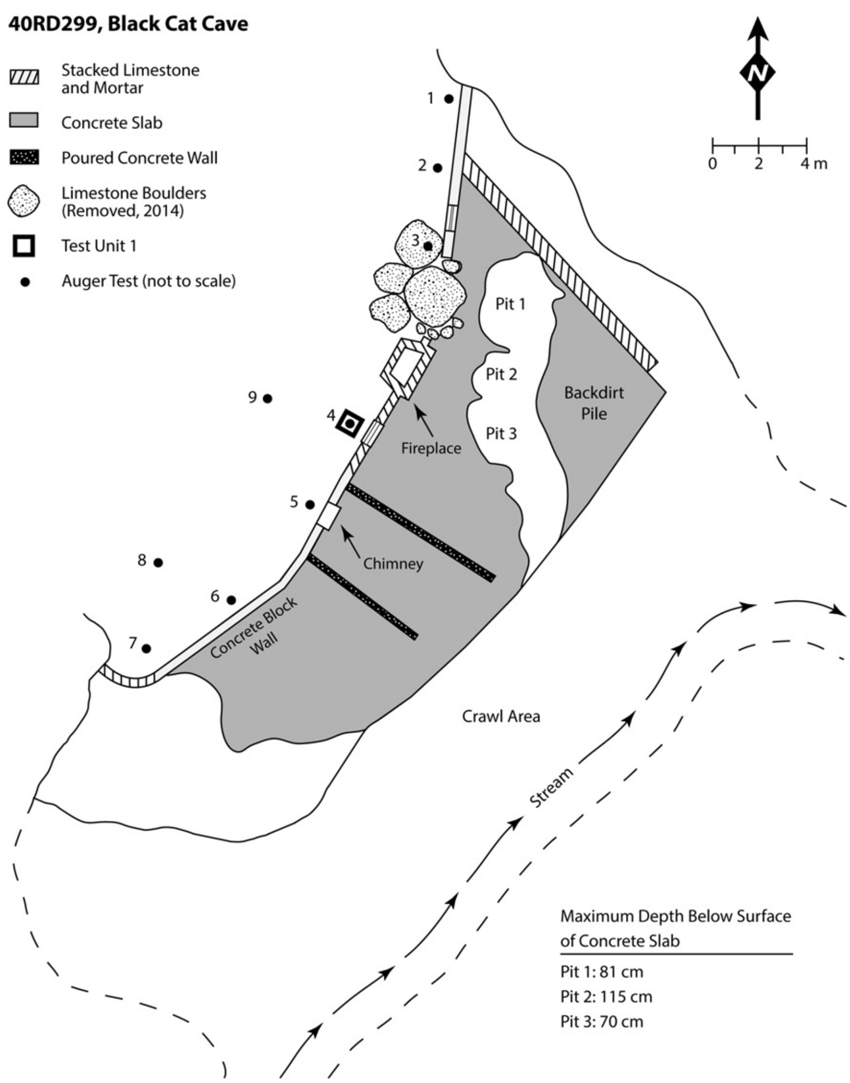

Fig. 3. Plan map of Black Cat Cave.

Fig. 4. Base of excavations of Test Unit 1, November 2014 (photo by T. M. Peres).

It is not known when the speakeasy and dance cave ceased operation, although by the 1970s the site had been abandoned as a place of business. Local informants recall that around that time the site was mainly used for illicit teenage parties and as a location for fraternity initiations by students of nearby Middle Tennessee State University (MTSU). In the late 1980s a large mass of limestone boulders and rubble was dumped along the eastern wall of the sinkhole and chain link fencing was strung across the cave mouth to discourage trespassing. Portions of these barricades were subsequently pried away, and until 2014 the cave continued to see regular traffic by spelunkers, teenagers, and other curious members of the public.

2.2. Overview of archaeological investigations of Black Cat Cave

The prehistoric deposits at Black Cat Cave were first documented in early 2004, when a spelunking college student reported the presence of a human skull to the Rutherford County Sheriff's Department. That skull was located in the largest of the three historic rooms, where a large portion of the concrete floor had been broken away and the underlying sediments disturbed by illicit digging. Investigators from the Sheriff's Department subsequently disinterred portions of at least five prehistoric graves during their efforts to determine if the reported skull was associated with a crime scene. All of the uncovered remains and a small collection of prehistoric artifacts were entered into evidence at the Sheriff's Department, where they remained until 2010.

In April 2010 as part of an effort to clear old case files, the Rutherford County Sheriff sent the remains from Black Cat Cave to the Forensic Anthropology Center at the University of Tennessee, Knoxville for analysis. Investigators there determined that the remains included an MNI of five individuals, consisting of one adult male, three adults of indeterminate sex, and a teenage female, all of whom were likely of Native American origin (Jantz and Hufnagl, 2010). In June of that same year the Rutherford County Sheriff contacted the TDOA requesting a transfer of those remains. TDOA archaeologist Aaron Deter-Wolf visited the site with representatives from the Rutherford County Sheriff's Department, and subsequently recorded the cave in the TSSF as site number 40RD299. The human skeletal remains and artifacts were transferred from the Sheriff's Department to the TDOA, where they were accessioned and added to the organization's NAGPRA inventory. In 2012 those remains were transferred on loan to Dr. Shannon Hodge at MTSU for osteological analysis.

2.2.1. Archaeological salvage efforts, 2014–2015

In February, 2014 a concerned citizen collected additional disturbed skeletal remains from Black Cat Cave, which they delivered to the TDOA. In the wake of that discovery, TDOA archaeologists met at the cave with Angela Jackson, the Associate Director of Murfreesboro Parks and Recreation, and with other Parks staff and the Murfreesboro City Attorney to discuss the site and possible preservation strategies. On the recommendation of the TDOA, Murfreesboro Parks and Recreation contacted the senior author, then at MTSU, in regards to conducting an assessment of damage to the cave caused by vandalism (including modern trash and graffiti) and illegal digging.

The authors worked alongside officials from the City of Murfreesboro to develop a plan to clean up the site and salvage data from looter pits and backdirt piles. In March of 2014, a group of MTSU student and alumni volunteers directed by Peres and Hodge removed substantial amounts of modern garbage from the site; cleaned, mapped, and recovered radiocarbon samples from intact stratigraphic profiles along the edges of the looter pits; screened (6.35 mm or 1/4 in. mesh) all looted backdirt for artifacts and human remains; and backfilled the looter pits with the screened soils.

In November 2014, the team returned to the cave to perform testing prior to installation of a custom security gate that will prohibit further anthropogenic disturbance while allowing for wildlife passage. That work included monitoring the removal of rubble and debris from across the cave entrance, as well as excavation of nine bucket auger tests in the location of gate footings and along the slope into the entrance of the cave (see Fig. 3).

A single 1 m × 1 m test unit was placed at the mouth of the cave where a bucket auger test (BAT 4) indicated the potential for intact deposits (Fig. 4; see Fig. 3). Excavation of this unit yielded in situ deposits and artifacts. However, these deposits were well below the depth of the gate footers and thus would not be disturbed by the gate installation.

Gate installation took place between January and March of 2015 (Fig. 5). Keasler was present on site to monitor the digging of the footers. No additional archaeological deposits were encountered during the installation process.

3. Results of 2014–2015 archaeological investigations

In addition to cleaning and protecting the site, one of the main goals for our work at Black Cat Cave was to establish an occupation range. This was accomplished through an analysis of diagnostic artifacts and radiocarbon samples from intact stratigraphic profiles. During the 2014 salvage effort the western wall of the looter pit was faced up by hand and profiled in order to record site stratigraphy. The historic concrete slab is underlain by up to 7 cm of brown silt loam midden (Fig. 6). This in turn is underlain by a series of horizontal burned clay surfaces, punctuated by discontiguous ashy soils and burned clay.

Fig. 5. View of the cave entrance in spring, 2016 facing south and showing the custom-built security/bat gate (photo by Aaron Deter-Wolf).

Fig. 6. Photo of intact stratigraphic profile in looter's pit under historic concrete slab (Photo by A. Deter-Wolf).

Heavy charcoal flecking appeared throughout the profile. The stratigraphic profile was terminated at the base of the looter pit in order to avoid possible disturbance to any *in situ* burials in accordance with Tennessee state laws regarding the excavation and treatment of human remains (Moore, 1989). For this reason, the maximum depth of archaeological deposits remains to be determined.

Burned surfaces identified in the stratigraphic profiles inside Black Cat Cave compare well with prepared clay surfaces from other Archaic sites in the region dating back to the Pleistocene/Holocene transition (Sherwood and Chapman, 2005). In their examination of similar surfaces from Dust Cave, Alabama and Icehouse Bottom in Tennessee, Sherwood and Chapman (Sherwood and Chapman, 2005) note that these features share attributes including thickness (1.5–3.0 cm), an overall flat profile, horizontal size of 50–100 cm in diameter, hard "fired" consistency, and stacked appearance.

At Dust Cave it was initially proposed that these surfaces represented natural cementation of soils saturated with calcite-rich water, although subsequent analysis has cast doubt on this interpretation (Sherwood and Chapman, 2005). It is unlikely that the hardened surfaces at Black Cat Cave were created by calcite-rich water dripping from the ceiling, as this part of the cave is a dry environment. Rather, based on comparative data from similar features at other sites (e.g., Homsey and Capo, 2006; Homsey et al., 2010; Sherwood, 2008; Sherwood and Chapman, 2005), these deposits can be understood to represent anthropogenic, deliberately-prepared fired clay surfaces; however, due to the lack of horizontal exposure and direct artifact associations, their specific function remains unclear.

Test Unit 1 was placed at the mouth of the cave (see Fig. 4). Stratigraphic profiles in Test Unit 1 revealed up to 100 cm of cultural deposits. Artifacts recovered from Test Unit 1 include groundstone fragments; a possible atlatl weight; and a partial dog burial with associated Archaic stone biface, a human molar, and a possible bone awl recovered from approximately 35 cm below ground surface. While small pieces of burned clay were recovered between 60–80 cm below ground surface, no prepared surfaces comparable to those documented inside the cave were present in Test Unit 1. The faunal materials excavated from Test Unit 1 exhibit excellent preservation, suggesting that the absence of fired-clay features at the cave mouth reflects cultural activity rather than issues of preservation.

3.1. Radiocarbon results

Carbonized material was collected from intact strata and submitted to Beta-Analytic of Miami, Florida for AMS dating. The first sample was recovered from 48 cm below the concrete floor and returned a conventional radiocarbon date of 6360 ± 30 B.P. (Beta-387783; charred material; δ13C/12C = −25.3‰). A second sample of charred material was recovered from 87 cm below the concrete surface and returned a conventional radiocarbon date of 6460 ± 30 B.P. (Beta-387782; charred material δ13C/12C = −26.8‰). These dates fall within the Middle Archaic period of the chronology of regional prehistory, and along with the documented stratigraphy suggest that the cave was the site of regular activity which resulted in the creation of distinct surfaces during the period from approximately 6460–6360 RCY B.P.

3.2. Diagnostic artifacts

A total of 26 diagnostic stone bifaces were recovered from disturbed contexts at Black Cat Cave, including the looted backdirt pile and along erosional channels within the twilight zone. These tools were grouped into temporally diagnostic type categories according to morphological characteristics (Table 1; Fig. 7). All of the lithic materials recovered from the cave were manufactured from locally-available varieties of Fort Payne Chert, and included both heat treated and non-heat treated specimens. As an assemblage, lithic artifacts from Black Cat Cave span the range of approximately 9000–1000 B.P., including portions of the Archaic, Woodland, and Mississippian periods of regional prehistory. While these artifacts reveal the cave to be multicomponent, the overall assemblage does not suggest the site was the location of regular habitation or use after the Archaic period. Investigations to date have not recovered any evidence of ceramic artifacts typical of Woodland and Mississippian period occupations in the American South.

As a result of the disturbed contexts where the temporally diagnostic artifacts originated, their precise relationship to the human skeletal remains is unclear. All lithic artifacts show indications of resharpening, wear, and in some cases breakage during their use life, suggesting they served at least part of their use life as utilitarian objects rather than being created specifically as mortuary inclusions (Deter-Wolf, 2004). In addition, the presence of artifacts within spoil piles suggests looters were not screening their dirt, and that these materials may have been overlooked because they were not directly associated with skeletal remains.

3.3. Human skeletal remains

The 2004 forensic work by the Sheriff's Department and the collaborative 2014–2015 salvage excavations resulted in the recovery of an estimated 11 adults and an unknown number of subadults from the site including at least one older child and 2 or more perinates. All human skeletal material recovered during the 2014–2015 investigations was situated within spoil piles associated with looting activity, with the exception of a single molar from Test Unit 1. As a result, burial positioning, orientation, and specific artifact associations are not

Fig. 7. Selected diagnostic lithic artifacts recovered from looter's spoil piles.

Table 1
Temporally diagnostic lithic artifacts from disturbed contexts at Black Cat Cave.

Type	Count	Period	Age range*
Kirk corner notched	1	Early Archaic	9500–8200 B.P.
Kirk stemmed	1	Early Archaic	8900–7900 B.P.
Lecroy	2	Early Archaic	8500–7800 B.P.
Morrow Mountain	7	Middle Archaic	7000–6500 B.P.
Late Archaic corner notched	10	Late Archaic	6700–6100 B.P.
Motley	1	Early Woodland	3400–2500 B.P.
McFarland triangular	3	Middle Woodland	1900–1400 B.P.
Sand mountain	1	Late Woodland–Mississippian	1600–1000 B.P.

* (Cambron and Hulse, 1990); (Justice, 1987).

known. Based on radiocarbon dating of exposed stratigraphy (see above) and the complete absence of distinctive limestone slabs associated with the stone box grave burial mode diagnostic of the late prehistoric period in the Middle Cumberland region (e.g., Dowd, 2008; Moore et al., 2006) it is likely that these graves originated in the Middle-Late Archaic periods of regional prehistory. Inventory and analysis of the human remains recovered from Black Cat Cave is on-going by Hodge and Keasler and will be the subject of future publications.

4. Faunal assemblage

Archaeologists often see animal remains as the byproducts of mundane daily, and on occasion, special, meals, and ignore that humans imbue animals with multiple layers of meaning and symbolism that go beyond mere nutrition. However, we know that human-animal relationships are more complex than this simple dichotomy. The specific cultural meanings given to animals by past human societies can be better understood when studied in terms of the context of the remains. Caves are ideal contexts to understand animal symbolism in that caves are conspicuous liminal locations on the landscape and for some groups stand as physical passageways between multiple worlds (Appleby and Miracle, 2012: 275). Throughout global human prehistory, caves are associated with human symbolic, ritual, and religious behaviors (e.g., Bahn, 1999; Emery, 2003; Moyes, 2012).

It is important to note that all of the animals identified in the Black Cat Cave assemblage, regardless of archaeological provenience, were deliberately introduced to the cave environment by humans as opposed to representing wash-in or the result of raptor prey deposits. The stream that flows in the back of Black Cat Cave drains into the Stones River, the only known source of freshwater mussels and gastropods in the area, and cannot account for the non-aquatic species identified or the artifacts identified in this assemblage. Cave faunal assemblages that contain raptor prey remains are typically comprised of an abundance of small mammal taxa. In the case of Cheek Bend Cave, large quantities (>18,000 NISP) of shrews (Soricidae) and moles (Talpidae) were recovered from late Pleistocene and Holocene deposits. Klippel and Parmalee (Klippel and Parmalee, 1982) determined these remains were the result of raptor kills, and especially owls. There is a marked decline in the quantities of these species once humans began using the site during the Holocene (Klippel and Parmalee, 1982: Table 1).

Although the specific stratigraphic context of material from the looted backdirt pile is unknown (though the area within the cave is known), the modifications and deposition of certain materials from the site suggests that they represent probable mortuary offerings or the focus of ritual activity associated with human burials. A total of 9224 (11,924.89 g) faunal remains were recovered from the looter pits and Test Unit 1 at Black Cat Cave and are the focus of this research. Overall the entire assemblage is diverse but not equitable (Table 2), as it is skewed towards aquatic invertebrates in terms of quantity. We further discuss the faunal sub-assemblages from the two main areas of the cave: the interior which contained human burials and distinct burned or prepared clay surfaces; and the mouth of the cave which contained 100 cm of intact cultural deposits. The comparison of these two sub-assemblages shows that the activities that took place in these areas are distinct yet related to each other.

4.1. Interior of cave faunal sub-assemblage

The faunal assemblage from the interior of the cave was recovered from the area labelled "backdirt pile" (see Fig. 3) that was directly on top of the northeast corner of the historic concrete slab. The backdirt pile was a direct result of illicit digging of Pits 1, 2, and 3 (see Fig. 3). These pits encompass an area of approximately 12 m (39 ft.) north/south by 4 m (12 ft.) east/west and maximum depths are between 70 cm (27.5 in.) and 100 cm (39 in.) below surface of the concrete slab. While we do not have direct stratigraphic control over the assemblage recovered during screening of this area, we are confident it was removed from this specific area and was in direct relation to the human remains also recovered from this location.

The total NISP of faunal materials recovered from the interior of the cave during salvage investigations is 8121 (10,202.46 g), and includes 47 taxa of both vertebrates and invertebrates (Table 3). While all taxonomic classes are present, this sub-assemblage is dominated by invertebrates (91.66% NISP) with 14 bivalve taxa and 11 aquatic gastropod taxa represented (Fig. 8). The remainder of the sub-assemblage is comprised of mammals (4.21% NISP, 12 taxa), and less than 1% NISP each of birds (3 taxa), reptiles (3 taxa), amphibians (1 taxa), and fish (1 taxa) (see Table 3; see Fig. 8).

The invertebrates include: 3275 specimens of bivalves from 14 taxa belonging to the family Unionidae (see Table 3). Unionidae is the family of freshwater pearly mussels that occur worldwide, but are especially diverse in the Eastern United States. These taxa thrive in freshwater streams and rivers, especially those with sand or gravel substrates and water depths of 2 m (6.6 ft.) or less (Smith, 2001). The Stones River is located 1.2 km (3/4 mile) northeast of the site, but after impoundment following the completion of J. Percy Priest Dam in the 1960s, mussel beds no longer exist along its course. While it is likely mussel beds were present along the Stones River in the Archaic, we cannot be sure of the source of the specimens at the cave. Regardless, given the directional flow of the stream that runs at the back of the cave, the invertebrates did not naturally wash into the site. Seventeen (0.85%) of the bivalves showed evidence of burning and one had a possible perforation.

While both terrestrial and aquatic gastropods are present in this sub-assemblage, the terrestrial gastropods (NISP = 64) are considered commensal and will not be discussed further. Aquatic gastropods (NISP = 987) are represented by 11 taxa, including members of two families

Table 2
Species diversity and equitability (Shannon-Weaver) for combined faunal assemblage, Black Cat Cave.

Vertebrates and Invertebrates	H′	V′
NISP	1.00	0.022

Table 3
Taxa identified from the interior of Black Cat Cave.

Taxon	Common Name	NISP	Weight (g)
Vertebrata	Vertebrates	23	5.05
Mammals			
Mammalia, large	Large mammals	157	438.29
Mammalia, small	Small mammals	22	3.16
Didelphis virginiana	Eastern opossum	8	13.68
Sylvilagus spp.	Rabbit	40	29.79
Rodentia	Rodents	16	3.77
Marmota monax	Woodchuck	4	12.2
Marmota monax, cf.	Woodchuck, compares with	4	10.96
Sciurus carolinensis	Eastern gray squirrel	19	9.86
Castor canadensis	Beaver	5	25.41
Canis familiaris, cf.	Domestic dog, compares with	1	1.99
Canis latrans	Wolf	1	2.27
Vulpes vulpes, cf.	Red fox, compares with	2	1.47
Urocyon cinereoargenteus	Gray fox	3	4.68
Procyon lotor	Raccoon	10	32.03
Mephitis mephitis	Striped skunk	8	14.52
Odocoileus virginianus	White-tailed deer	51	383.49
Odocoileus virginianus, cf.	White-tailed deer, compares with	1	1.18
Mammalia sub-total		352	988.75
Birds			
Aves	Birds	32	17.95
Meleagris gallopavo	Wild turkey	3	16.26
Meleagris gallopavo, cf.	Wild turkey, compares with	6	4.81
Cardinalis cardinalis, cf.	Northern cardinal, compares with	1	0.22
Aves sub-total		42	39.24
Reptiles			
Testudines	Turtles	11	4.1
Kinosternidae	Family of mud and musk turtles	4	1.32
Kinosternidae, cf.	Family of mud and musk turtles, compares with	2	2.46
Emydidae	Family of pond and marsh turtles	1	1.42
Terrapene carolina	Common box turtle	3	37.4
Terrapene carolina, cf.	Common box turtle, compares with	5	10.02
Trachemys scripta, cf.	Pond slider, compares with	3	3.68
Apalone sp.	Softshell turtle	1	0.57
Reptilia sub-total		30	60.97
Amphibians			
Amphibia	Amphibians	2	0.23
Amphibia sub-total		*2*	0.23
Fish			
Osteichthyes	Bony fish	5	1.32
Lepisosteus sp.	Garfish	1	0.31
Fish sub-total		6	1.63
Vertebrates total		455	1095.87
Invertebrates			
Decapoda spp.	Crustaceans	1	0.25
Crustacean sub-total		1	0.25
Bivalves			
Unionidae	Family of freshwater mussels	1971	1881.5
Actinonaias sp.	Mucket	10	101.49
Amblema plicata	Threeridge	150	1718.78
Cumberlandia monodonta	Spectaclecase	6	44.4
Cumberlandia monodonta, cf.	Spectaclecase, compares with	11	86.14
Cyclonaias tuberculata	Purple wartyback	12	22.03
Elliptio spp.	Elliptio	824	2144.97
Epioblasma spp.	Sugarspoon/riffleshell	33	94.6
Lampsilis spp.	Pocketbook	41	222.94
Megalonaias nervosa	Washboard	4	80.61
Obliquaria reflexa	Threehorn wartyback	3	2.83
Obovaria subrotunda	Round hickorynut	11	30.51
Pleurobema spp.	Clubshell	192	471.32
Quadrula cylindrica	Rabbitsfoot	6	52.27
Quadrula quadrula	Mapleleaf	1	7.98

(continued on next page)

Table 3 (*continued*)

Taxon	Common Name	NISP	Weight (g)
Bivalve sub-total		3275	6962.37
Gastropods			
Gastropoda, aquatic	Aquatic gastropods	384	54.68
Amnicola limosa	–	96	73.46
Campeloma decisum	Pointed campeloma	39	13.05
Planorbidae	Rams-horn snails	100	27.61
Helisoma anceps, cf.	Two-ridge rams-horn	50	68.56
Leptoxis spp.	Rocksnail	6	2.45
Lithasia armigera	Armored rocksnail	96	87.56
Lithasia spp.	Rocksnail	362	207.5
Pleuroceridae	Family of pleurocerids	987	510.46
Pleurocera canaliculata	Hornshell	45	15.72
Pleurocera clavaeformis	–	372	189.87
Pleurocera claveaformis, cf.	–	242	128.1
Pleurocera laqueata	–	1328	605.76
Pleurocera simplex	–	2	1.01
Pleurocera troostiana	–	217	106.13
Gastropoda, terrestrial	Terrestrial gastopods	40	11.74
Mesodon spp.	Globe	5	9.81
Mesodon spp., cf.	Globe, compares with	19	30.5
Gastropod sub-total		4390	2143.97
Invertebrates total		7666	9106.59
Interior of cave sub-assemblage total		8121	10,202.46

(see Table 3). Approximately 3% of the aquatic gastropods recovered from the interior of the cave were burned. Additionally, there is a single specimen of Decapoda, possibly representing a crayfish native to the cave environment. This specimen may or may not be commensal to the assemblage.

Interestingly, the mammals are also represented by high species diversity—12 taxa, but low richness. In terms of NISP, mammals comprise less than 5% of the sub-assemblage. Identified taxa include typical Eastern Woodlands fauna such as squirrels (*Sciurus carolinensis*), rabbits (*Sylvilagus* spp.), white-tailed deer (*Odocoileus virginianus*), and the Virginia opossum (*Didelphis virginiana*) (a marsupial). However, the majority of the mammal taxa belong to either Rodentia, including squirrels, beaver (*Castor canadensis*), and woodchuck (*Marmota monax*); or Carnivora, including a possible domestic dog (*Canis familiaris*), coyote (*Canis latrans*), skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), and raccoon (*Procyon lotor*)). One of the deer ulna was from a fetal specimen. Two bacula were identified in this assemblage, one from a male raccoon, and one from a male beaver.

Birds, reptiles, amphibians, and fish each comprise less than 1% of the sub-assemblage NISP. Notable among these taxa are the eastern box turtle (*Terrapene carolina*) and garfish (*Lepisosteus* sp.). The box turtle is represented by both carapace and plastron elements, though no modifications were recorded. The garfish is represented by a single scale. Both taxa are known to have strong ritual associations from other sites during the Archaic and/or Mississippian periods in Tennessee (Brown, 2011; Peres and Deter-Wolf, 2016a).

Modified animal remains (other than heat alteration alone) from this sub-assemblage include: six mammal diaphyses splinters that were sharpened and polished; the right mandible of a woodchuck stained with ochre; a raccoon maxilla stained with ochre; one freshwater mussel valve with red ochre and two paired freshwater mussel shells stained with ochre. Notably the woodchuck mandible and raccoon

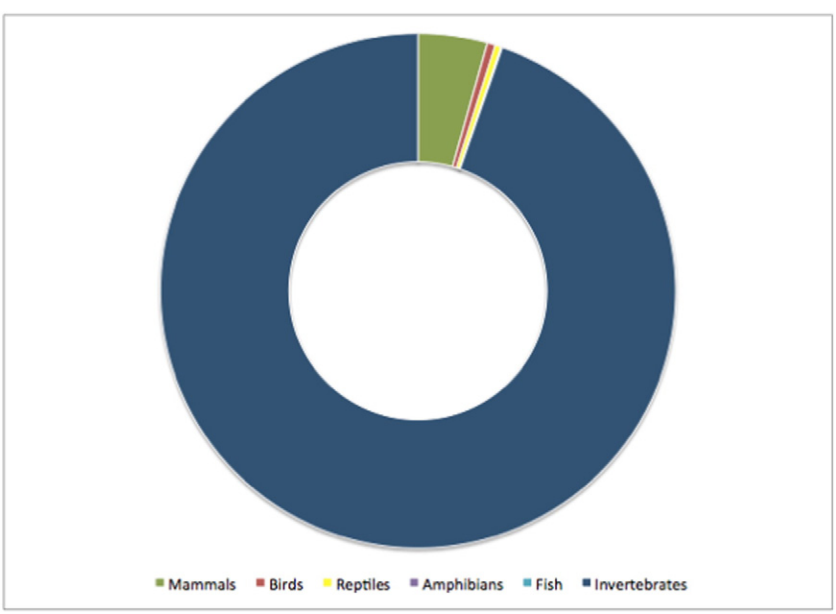

Fig. 8. Taxa identified from interior of cave, %NISP by class, Black Cat Cave.

Table 4
Taxa identified from Test Unit 1, Black Cat Cave.

Taxon	Common name	NISP	Weight (g)
Vertebrata	Vertebrates	9	11.14
Mammals			
Mammalia, large	Large mammals	3	19.66
Mammalia	Mammaos	110	54.6
Mammalia, large/medium	Large/medium mammals	1	4
Mammalia, medium	Medium mammals	7	13.46
Mammalia, small	Small mammals	2	0.85
Mammalia/Aves	Mammals/birds	22	7.64
Syvilagus floridanus	Eastern cottontail rabbit	1	0.55
Syvilagus spp.	Rabbit	1	0.3
Sciurus carolinensis	Eastern gray squirrel	2	0.77
Canis familiaris	Domestic dog	48	168.2
Vulpes vulpes, cf.	Red fox, compares with	1	1.56
Procyon lotor	Raccoon	3	4.7
Procyon lotor, cf.	Raccoon, compares with	1	0.74
Odocoileus virginianus	White-tailed deer	7	155.96
Mammals sub-total		209	432.99
Birds			
Grus canadensis, cf.	Sandhill crane, compares with	2	13.22
Birds sub-total		*2*	*13.22*
Turtles			
Testudines	Turtles	1	0.82
Kinosternidae	Family of mud and musk turtles	1	1.35
Turtles Sub-total		2	2.17
Vertebrates Total		222	459.52
Bivalves			
Unionidae	Family of freshwater bivalves	492	902
Amblema plicata	Threeridge	7	77.39
Elliptio sp.	Elliptio	12	27.83
Pleurobema spp.	Clubshell	11	26.68
Bivalves sub-total		522	1033.9
Gastropods			
Gastropoda, aquatic	Aquatic gastropods	41	26.59
Lithasia verrucosa	Varicose rocksnail	2	2.37
Pleurocera spp.	–	180	128.24
Pleurocera troostiana	–	54	28.26
Viviparidae	Family of river snails	6	7.45
Gastropods sub-total		283	192.91
Invertebrates total		805	1226.81
Test Unit 1 sub-assemblage total		1103	1722.43

maxilla were defleshed prior to having the ochre applied to the bones and teeth of these specimens. The paired mussel shells were first burned then had ochre applied to the interior of the shells.

4.2. Mouth of cave faunal sub-assemblage

Faunal remains were recovered from all levels of Test Unit 1 and included both vertebrates and invertebrates, terrestrial and aquatic, for a total NISP of 1103 (1722.43 g) (Table 4). Taxa represented include: small, medium, and large mammals, white-tailed deer, domestic dog, possible red fox, eastern gray squirrel (*Sciurus carolinensis*), rabbit (*Sylvilagus floridanus* and *Sylvilagus* sp.), raccoon, possible sandhill crane (cf. *Grus canadensis*), turtle (Testudines), freshwater mussels (Unionidae), and freshwater snails (Pleuroceridae and Viviparidae). It is likely that some of these animals were brought to the cave as food items; however, there are several indications that some of these animal specimens served non-dietary purposes. Even the ones that were food may have been imbued with particular meaning and significance and thus consumed within a ritual framework.

Modifications to the vertebrate remains included burning, cut marks, and working of bone into tools. A total of 16 vertebrate specimens were burned. The sandhill crane is represented by a partial right humerus (two pieces mend together) with cut marks near the proximal end. A distal left radius from a possible red fox shows evidence of being worked and polished. Worked bone includes: a mammal longbone diaphysis fragment turned into an awl, a white-tailed deer ulna awl, and a polished mammal longbone fragment.

A domestic dog burial was encountered in Test Unit 1, approximately 35 cm below ground surface. While the entire skeleton is not represented, a total of 49 (163.94 g) elements are accounted for. Based on tooth eruption sequences (Silver, 1963), these remains are from a single individual that is estimated to have been between 5 and 7 months of age when it died. As mentioned above, several artifacts were recovered in association with this dog- a human molar, an Archaic projectile point/biface, a deer ulna modified into an awl, and a polished/sharpened large mammal long bone diaphysis splinter.

Invertebrates identified within Test Unit 1 include freshwater bivalves and two families of aquatic gastropods (Pleuroceridae and Viviparidae). The native habitat for these species consists of rocky, shallowly-submerged substrates such as those at open-air confluences where lower order streams empty into higher order waterways, depositing their erosional bed loads and creating rocky shoals. No such shoals are located along the underground stream passage upstream from Black Cat Cave. A number of these natural features were likely situated along the main channel of the East Fork of the Stone's River in the vicinity of the site. However, as described above, these shoals have been largely inundated and the associated shellfish beds destroyed as a result of modern development, and it is therefore not possible to identify the specific origin of the invertebrate remains from Black Cat Cave.

5. Discussion

Caves and rockshelters of the Eastern Woodlands were used for multiple purposes since the late-Pleistocene. People have sought shelter and refuge in these natural features, used them as storage facilities for caches of raw materials for tool production, prepared food in them, buried their dead in them, and decorated their walls with artistic and meaningful cultural expressions. Traditionally, archaeologists working in the Eastern Woodlands have interpreted the Paleoindian and Archaic occupation of caves as temporary housing for hunters and gatherers during seasonal rounds. It is not until the more recent Mississippian period, when we have numerous records of parietal art, that caves are interpreted as having symbolic, ritual, or religious meanings. This refusal to acknowledge the potential multiple roles given to caves by past human societies has limited our understanding of the Archaic period landscape. We compare the artifact and faunal assemblages from Black Cat Cave with those from other cave sites in the region (Dust Cave, Alabama and Sachsen Cave, Tennessee) based on the following criteria: the sites all contain an Archaic component; there was some level of professional excavation; and the excavation yielded faunal remains. This comparison is used to show that human societies in the Archaic period were more complex and people's lives included many activities and meanings beyond hunting and gathering.

Dust Cave, located south of Black Cat Cave in the southern Interior Low Plateau of northern Alabama, yielded human and animal remains from the Middle Archaic Eva/Morrow Mountain (7000–6000 years BP) and Seven Mile Island (6000–52,000 years BP) components. Walker (Walker, 2010) notes that for Dust Cave, there was a shift through time from the use of the cave as a living space in the Paleoindian period to its use as a burial site in the Archaic period. The vertebrate faunal assemblage is markedly different between the Late Paleoindian and Middle Archaic periods (Walker, 1998: Table 7.1). The Late Paleoindian faunal assemblage analyzed by Walker (Walker, 1998: Table 7.1) consisted of 2413 vertebrate specimens; the Eva/Morrow Mountain assemblage consisted of 2127 specimens, and the Seven Mile Island assemblage consisted of 1096 specimens. All faunal materials were recovered either through flotation or water-screened 6.35 mm (1/4-inch) mesh (Walker, 1998). During the Paleoindian period, birds comprised the majority of the faunal assemblage (nearly 70% NISP), including a cache of 23 complete and partial humeri identified as Canada goose (*Branta canadensis*) and giant Canada goose (*Branta canadensis maxima*), potentially representing raw materials stored for tool making or ritual deposition (Walker, 1998; Walker and Parmalee, 2004: Fig. 7.1). There is a sharp increase in the deposition of mammals between the Late Paleoindian (19% NISP) and Middle Archaic components (32–63% NISP) with a corresponding decrease in birds (39 and 16% NISP) (Walker, 1998: 136–139). Of the birds identified in the Middle Archaic components, most were terrestrial taxa, versus the higher incidence of migratory waterfowl taxa in the Late Paleoindian deposits. There was also an increase in fish taxa while the use of reptiles and amphibians was fairly consistent from the Late Paleoindian to Middle Archaic occupations (Walker, 1998:138). While freshwater bivalves and gastropods are present in the Dust Cave assemblage, the analysis undertaken so far is preliminary summative (Parmalee, 1994), making it difficult to make comparisons between Dust Cave and Black Cat Cave. Walker (Walker, 1998:138) links the changes in faunal exploitation to environmental changes and to humans adapting to the local variation in animal populations in and around Dust Cave.

Walker (Walker, 1998) notes that the majority of bone tools (n = 89) recovered from all components at Dust Cave belong to the Middle Archaic components (n = 65). Modified bone tools from the Middle Archaic components include: 37 awls, one awl/point, one bead/tube, nine antler tines, four spatulas, three needles, three points, one wedge, and six worked objects (Walker, 1998: 165). A total of 37 human burials associated with the Middle Archaic occupation were recovered at Dust Cave, though only a few contained associated artifacts (Walker, 2010:439). Four domestic dog burials were excavated from the same temporal component and in the same area as the human burials. One of the dogs was buried with a late-Middle Archaic Benton type projectile point/knife (Morey, 1994:163). One other dog had associated grave goods, and one was buried alongside a 15 year-old human male (Walker, 2010:437–439). It is notable that humans and dogs were not buried in the cave until the Middle Archaic period (ca. 6900–3600 cal B. C.) (Walker, 2010:439), and suggests that the use of certain caves and rockshelters as mortuaries represents a significant reorganization of the Archaic landscape.

The Sachsen Cave site is located to the northwest of Black Cat Cave in the Upper Cumberland Plateau. Both sites contain Archaic Period occupations that include faunal materials, though Sachsen Cave is in an upland setting and contained no human burials. The faunal assemblage from Sachsen is much smaller (NISP = 737) and has a much different composition than that of Black Cat Cave. At Sachsen, mammals dominate the assemblage, comprising 90% of the NISP and invertebrates comprise 1% (Franklin et al., 2010:465, Table 3). The species represented include black bear (*Ursus americanus*), white-tailed deer, and gray squirrel. Unlike Black Cat Cave, there are no other carnivores or other rodents identified in the sample from Sachsen. Franklin et al. (Franklin et al., 2010:474) interpret this as a "family type camp site where…hunting and nut gathering/processing" were the main activities.

Deter-Wolf and Moore (Deter-Wolf and Moore, 2015) recently proposed an initial model for Archaic period settlement patterning in the Central Basin of Tennessee based on a growing body of data from sites along the Cumberland and Harpeth Rivers (e.g., Deter-Wolf, 2004; Deter-Wolf and Peres, 2012; Miller et al., 2012a; Miller et al., 2012b; Peres and Deter-Wolf, 2016b; Peres et al., 2012; Wampler and McKee, 2012). This model is centered around large seasonal base camps located along the natural levees and lower terraces of the Cumberland and its major tributaries. These sites often include substantial mortuary components and shell-bearing middens, as well as foreign or exotic materials, and features including hearths and prepared surfaces.

Group territories surrounding the major seasonal base camps included secondary base camps which were similar in composition, but smaller in both horizontal extent and midden depth. Secondary base camps may appear along both higher order streams and smaller tributaries. Finally, the settlement model includes temporary campsites, and special purpose/resource extraction sites, which were "…situated across the landscape to address specific resource acquisition and perhaps social needs" (Deter-Wolf and Moore, 2015:24). These sites typically exhibit lower artifact densities than is found at the base camps, slight or absent midden formation, and may include expedient burials lacking exotic or high-status grave goods.

While periodic human burials appear at all types of Archaic sites within the Central Basin, major Archaic mortuary activity has seemed – until now – to be limited to the large seasonal and secondary base camps. These locations likely represent areas where Archaic forager groups congregated periodically to exchange goods and to bury their dead. The large mortuaries at these sites often correspond to shell midden deposits comprised predominately of freshwater gastropod species, and may have acted as monuments or territorial markers, associating both the sites and their surrounding territory with specific groups or lineages (Deter-Wolf and Peres, 2014).

Caves were seldom used during the Archaic period in Tennessee, and their use as mortuary sites is even more restricted. Just nine of the 25 Archaic cave sites in Tennessee are also recorded to contain human skeletal remains or graves, and at only three of these (40RB2, 40MT16, and 40RD299; see Fig. 1) can the mortuary component be confidently identified as originating in the Archaic period. Therefore, prior to the present research, a cave site in Middle Tennessee would have fit within the Archaic settlement model under the category of "special purpose/resource extraction" sites (Deter-Wolf and Moore, 2015:24), as possible locations for the procurement of resources and raw materials such as minerals and chert (e.g., Franklin, 1999). The recent work at Black Cat Cave suggests that the category of "special purpose" sites should be expanded to include dedicated mortuary locales.

A strong association exists in ancient Native American cosmology between caves and the souls of deceased individuals. Examinations of ancient art and ethnographic study have revealed that by the late prehistoric period Native Americans envisioned the universe as a multi-layered cosmogram, stacked vertically above the Beneath World (e.g., Reilly, 2004). That underwater realm was accessible through bodies of water, caves, and via the Path of Souls (Claassen, 2008; Faulkner, 1986; Faulkner, 1996; Hall, 1997; Heyden, 2005; Reilly, 2004). It was along the Path of Souls, conceptualized as the Milky Way, that spirits of the deceased traveled from the Middle World to the Realm of the Dead (Lankford, 2007).

The setting and layout of Black Cat Cave suggests that certain elements of late prehistoric Native American cosmology may have existed by the Archaic, and been incorporated into the site use. The opening of Black Cat Cave faces due west, towards the setting sun, a connection that by the late prehistoric period is strongly associated with death (Lankford, 2007). As a western-facing cave with flowing water, the twilight zone of Black Cat Cave functioned as a liminal region between the Middle World of living humans and the watery Beneath World. It was a location where the bodies of the deceased could be installed with immediate access to the Path of Souls, leading them westward towards their final destination at the setting sun.

The mortuary symbolism of the site is further affirmed by the faunal material recovered during the 2014–2015 investigations, including both the dog burial just outside the cave mouth and the presence of freshwater gastropods. In Warren's (2004) analysis of Archaic dog burials in the Southern Ohio Valley she noted a distinction between dogs buried with humans and dogs buried at human sites but by themselves. Dogs buried with humans had signs of having spent their lives as pack animals as noted by distinctive skeletal pathologies, while dogs buried by themselves did not exhibit these pathologies and thus were not pack animals (Warren, 2004). The Black Cat Cave dog does not exhibit any modifications or pathologies; however, the vertebrae, which are the main element in determining if an animal carried loads, are missing.

The location of the dog burial at Black Cat Cave to the west of the human cemetery and along the opening of the cave may symbolize special treatment for a lost canine companion or as evidence of ritual activity, perhaps related to the cosmological significance of caves described above (Claassen, 2015; Claassen, 2010; Morey, 2006; Morey and Wiant, 1992; Walker et al., 2005; Warren, 2004). Dogs serve as guides to humans on the journey to the land of the dead in many cultures (Claassen, 2010; James, 2006) and appear in numerous Native American belief systems as judges who preside over the spirits of the deceased along the Path of Souls (Lankford, 2011). It is possible that the dog at Black Cat Cave was placed at the mouth of the cave to act as a guide or gatekeeper, shepherding the deceased along their western journey.

Black Cat Cave is not a shell mound, which is the more typical type of Archaic period mortuary site in the Southeastern United States (Claassen, 2010); however, the presence of freshwater gastropods at Black Cat Cave suggests that there may be shared ritual elements with those other site types. Like shell mounds, Black Cat Cave does not appear to have been an area of permanent or semi-permanent occupation, but instead was a specialized component of a larger settlement system.

According to Claassen (Claassen, 2010; Claassen 2012), Archaic period artifacts previously interpreted as domestic debris in shell mounds and some cave sites are better looked at as remnants of feasts held during mortuary rituals. During Archaic funerary ceremonies as well as later visits to the grave, "fires surrounding and overlying the burial pits were lighted and large quantities of food were consumed and deposited with the dead" (Claassen, 2010:167). The prepared clay floors at Dust Cave have recently been re-interpreted as cooking surfaces (Homsey and Capo, 2006; Homsey et al., 2010; Sherwood and Chapman, 2005) instead of residential spaces. These rituals and activities can explain the presence of the burned surfaces in the intact stratigraphic profiles of Black Cat Cave as well as the food remains brought specifically to this site. In keeping with traditions recognized at other Archaic sites, one interpretation is that these shellfish were brought to the cave for mortuary rituals that involved feasting, renewal rites, and interment of the dead (cf. Claassen, 2010).

Additional evidence of ritual activity that may be associated with these events includes the presence of red ochre on woodchuck and raccoon remains, as well as within two bivalves recovered within the cave. Red ochre has long been recognized as an important symbolic substance employed in body decoration, parietal art, ritual activity, and for a variety of functional purposes (see discussions in Stafford et al., 2003; Jodry and Owsley, 2014) at sites throughout the world. The association of ochre pigment with defleshed animal mouth parts recovered from the interior of Black Cat Cave and simultaneous absence of ochre residue on stone and bone tools would appear to be a strong indicator that the material was not being used for functional activity such as tool hafting (e.g. Wadley et al., 2004).

Ethnographic and archaeological evidence from Eastern North America has demonstrated that bivalve shells are included within assemblages of ritual paraphernalia known as sacred bundles, both for their symbolic value and connection to the Beneath World (Deter-Wolf and Peres, 2014) and as tools for mixing and holding carbon- and ochre-based pigments (e.g., Deter-Wolf et al., 2013; Deter-Wolf, 2013b). No evidence of parietal art has been identified within the cave to date, and it is therefore likely that the ochre held in the bivalve shells was intended for use decorating ritual accoutrements (such as the animal mouth parts), or the bodies of either the living and/or the deceased.

Recent research by Peres and Deter-Wolf (Deter-Wolf and Peres, 2014; Peres and Deter-Wolf 2016b) on predominately gastropod Archaic shell middens along the Cumberland River to the north of Black Cat Cave suggests that these sites represent deliberate modifications of the landscape representing a combination of enduring foodways and ancestor-focused ritual activity. Over centuries as gastropods were consumed and their shells deposited at specific points on the landscape – typically at the intersection of riparian and riverine environments – these sites accumulated very little artifactual evidence for everyday activities, while simultaneously functioning as the focus for major mortuary activity. Interment of the deceased within these shell sites over multiple generations would have served to consecrate the landscape and lay claim to surrounding clan territory. At Black Cat Cave, the association between a significant mortuary component and shell-bearing midden suggests the site may have served a similar function in how its inhabitants conceived of this landscape at the confluence of the above and below worlds. Black Cat Cave is not located along the main channel of the Stones River, and therefore would not have been as conspicuous a marker of identity as a large base camp or a site of mounded shells. Instead, the use of this unique landscape feature would have served a much more intimate social function.

6. Conclusions

Our investigations into the previously unknown prehistoric component of Black Cat Cave in Rutherford County, Tennessee, have allowed us to add to the growing database of information about the prehistoric use of caves in Tennessee and the Eastern Woodlands and the larger Archaic period landscape. While several cave sites with archaeological deposits have been officially recorded within Rutherford County, only Black Cat Cave has received any professional attention. Although the majority of the data we recovered from Black Cat Cave was the result of salvage work in the aftermath of looting activities, the available contextual information has allowed us to understand this site as an area of important mortuary activities during the Archaic. Despite prior looting, a large portion of the site remains intact and protected beneath the concrete floor that was laid down during the historic period. We therefore anticipate that future research at Black Cat Cave will continue to yield important information on the prehistoric sequence of Middle Tennessee.

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