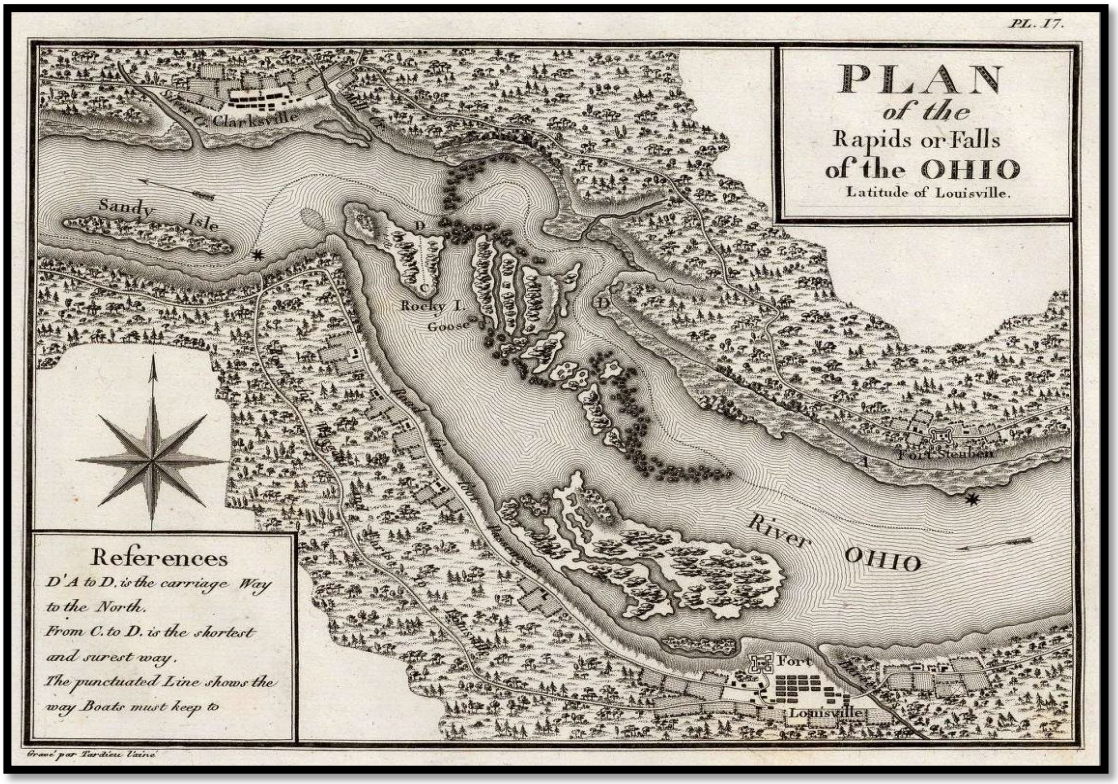
CURRENT ARCHAEOLOGICAL RESEARCH IN KENTUCKY

VOLUME 12



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Kentucky Heritage Council

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2026

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Frankfort, Kentucky 40601

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Cover Photo: 1796 Plan of the Rapids at the Falls of the Ohio River extracted from *The Fisherman of the Falls of the Ohio: The Relevance of Fishing in Late Middle Archaic Settlement Dynamics* (Bader 2026).

PREFACE

Since its creation in 1966, the Kentucky Heritage Council has taken the lead in preserving and protecting Kentucky's cultural resources. To accomplish its legislative charge, the Kentucky Heritage Council maintains three program areas: Site Development, Site Identification, and Site Protection.

The Site Development staff run the historic rehabilitation tax credit program and manage the agency's preservation easement portfolio. The Main Street program provides technical assistance in downtown revitalization to communities throughout the state. The Site Identification staff maintain the inventory of historic buildings and are responsible for working with a Review Board, composed of professional historians, historic architects, archaeologists, and others interested in historic preservation, to nominate sites to the National Register of Historic Places. The African American Heritage Commission, the Martin Luther King, Jr Commission, and the Native American Heritage Commission are under this program's umbrella, as well as data management.

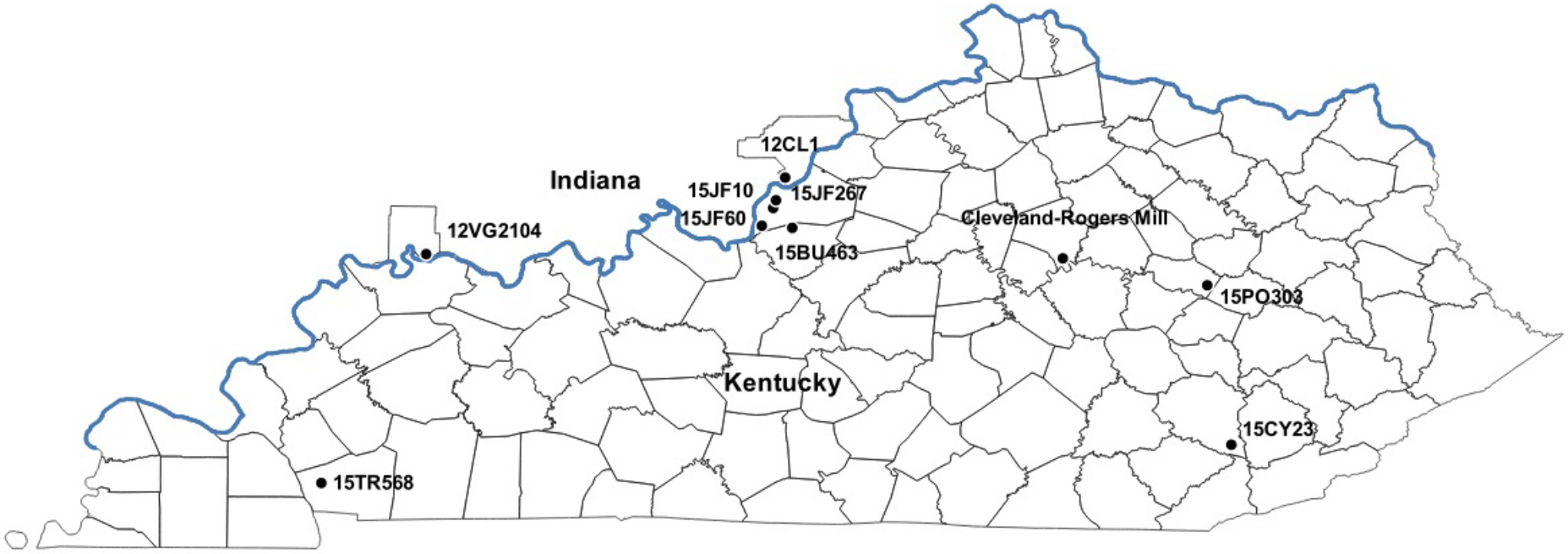
The Site Protection staff work with a variety of federal and state agencies, local governments, and individuals to assist in their compliance with Section 106 of the National Historic Preservation Act of 1966 and to ensure that potential impacts to significant cultural resources are adequately addressed prior to the implementation of federally funded or licensed projects. The staff are responsible for administering the Kentucky Heritage Council's archaeological programs; organizing the annual archaeological conference, including the editing and publication of selected papers; and the dissemination of educational materials.

This Volume contains papers presented at the 42nd Annual Kentucky Heritage Council Archaeological Conference as well as contributed papers. The 42nd conference was held at the Kenlake State Resort Park Lodge in 2025 and was co-sponsored by the Kentucky Organization of Professional Archaeologists (KyOPA), Achulean Consulting, LLC., Cultural Resource Analysts, Inc., Falls of the Ohio Archaeological Society, HMB Professional Engineers, Inc., Kentucky State Parks, Murray State University, National Forest Service, Stantec, Inc., Western Kentucky University, Wickliff Mounds State Historic Site, and WSP Global, Inc.

As in years past, the papers presented in this Volume provide a cross-section of archaeological research conducted in Kentucky. The map on the next page illustrates the general locations of major sites and project areas discussed in this Volume.

We would like to thank everyone that has participated in the Kentucky Heritage Council Archaeological Conferences. Without your support, these conferences would not have been as successful as they have been. Finally, we would like to thank those who have contributed papers and the editors that made the publication of this Volume possible.

The Site Protection Archaeology Team
Kentucky Heritage Council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Indiana
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15JF60
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Cleveland-Rogers Mill
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LOST IMAGE: INSIGHTS FROM A LOOTED ROCKSHELTER

by
Larry Gray

ABSTRACT

Lost Image Rockshelter (15Po303) is an ancient Native American site located along the western edge of the Cumberland Plateau in Powell County, Kentucky. It is situated within the Red River Gorge in the Daniel Boone National Forest. The site was recorded in June 1992 by U.S. Forest Service archaeologists. The rockshelter had been heavily looted. Ceramics, faunal remains, and lithics were observed scattered across the site surface. Numerous shovel test probes were excavated, one of which documented intact subsurface deposits. Two possible scenarios can be offered to characterize the site's occupational history. Ancient Native peoples may have used Lost Image Rockshelter at various times from the Middle/Early Late Woodland period to the early Fort Ancient period, making it a multicomponent site. Alternatively, Native groups may have used the rockshelter for a short period, dating from the terminal Late Woodland period to the early Fort Ancient period, reflecting a single component site. Ceramics represent both Late Woodland and Fort Ancient time periods. Diagnostic projectile points and a single acceptable radiocarbon date corroborate the ceramic data. A provisional terminal Late Woodland ceramic series, the Chimney Top Ceramic Series, was defined during this study. Diagnostic characteristics include thick vessel walls and cord-wrapped, dowel-impressed, thickened rimstrip/rimfolds on jars. An examination of site assemblages within a 5km radius of Lost Image Rockshelter identified other examples of the new ceramic series. Lost Image Rockshelter holds valuable information concerning the utilization of rockshelters within the Red River Gorge. It also potentially holds important information about the movement of Native peoples within the wider Ohio River drainage region.

INTRODUCTION

Lost Image Rockshelter (15Po303) is an ancient Native American site located along the western edge of the Cumberland Plateau in Powell County, Kentucky, within the Red River Gorge in the Daniel Boone National Forest. A variety of artifacts, a new provisional ceramic series, the Chimney Top Series, defined by thick vessel walls and cord-wrapped, dowel-impressed, thickened

rimstrip/rimfolds on jars, and a single acceptable radiocarbon date indicate that Lost Image Rockshelter was likely utilized periodically as a campsite.

Two possible scenarios can be offered to characterize the site's occupational history. Ancient Native peoples may have used Lost Image Rockshelter at various times from the Middle/Early Late Woodland period to the early Fort Ancient period, making it a multicomponent site. Alternatively, Native groups may have used the rockshelter for a short length of time, dating from the terminal Late Woodland period to the early Fort Ancient period, reflecting a single component. Ceramics represent both Late Woodland and Fort Ancient time periods. Lost Image Rockshelter holds valuable information concerning the utilization of rockshelters within the Red River Gorge. It also potentially holds important information about the movement of Native peoples within the wider Ohio River drainage region.

SITE DESCRIPTION

Lost Image Rockshelter (15Po303) is located in northeastern Powell County, Kentucky (Gray 2023). This northeast-facing rockshelter is located directly below the top of a sandstone cliff near the head of an unnamed stream feeding the Right Fork of Chimney Top Creek. The site sits at approximately 1160 meters above mean sea level (Figure 1).

Figure 1. View of the Front of the Shelter.

The shelter measures approximately 21 meters wide by 9.5 meters deep (Figure 2). The ceiling is five meters high at the dripline (Figure 3). The floor consists of dry, loose sand. Some rockfall and mounds of backdirt, created by indiscriminate looting, are scattered about. Ancient Native American artifacts were fairly evenly distributed within the shelter. Based on looter debris/trash left behind on the site surface (a Mountain Dew soft drink bottle in the style used during the 1960s), it was most likely looted at that time (Figure 4).

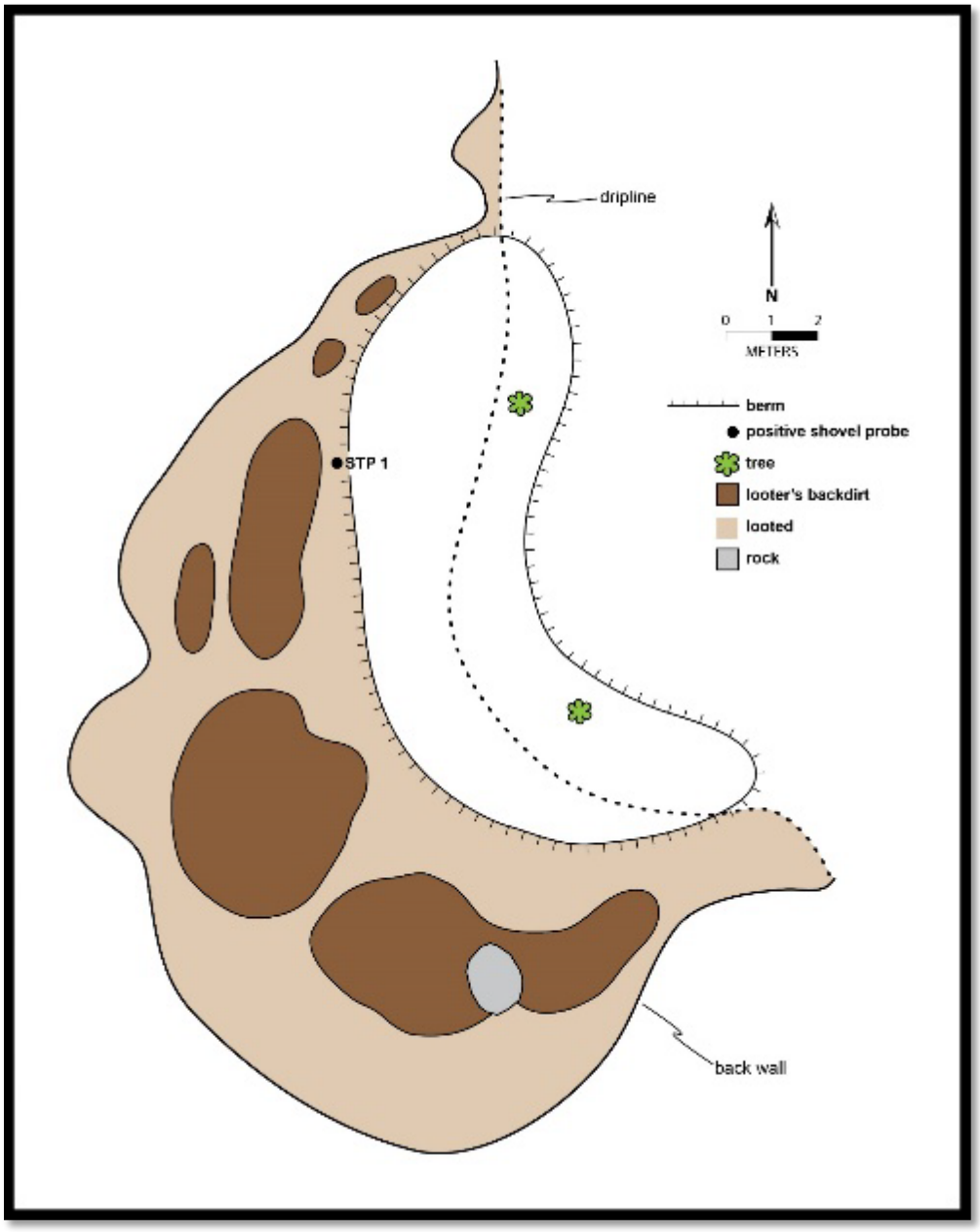

Figure 2. Shelter Planview.

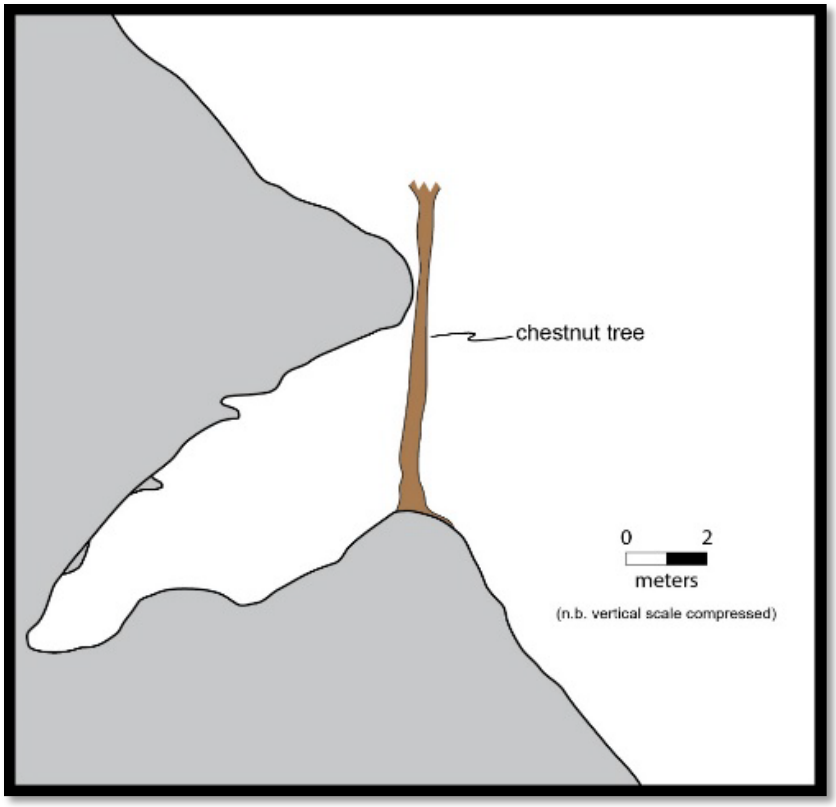

Figure 3. Shelter Profile.

Figure 4. Evidence of Historic Period Disturbance.

HISTORY OF INVESTIGATIONS

Lost Image Rockshelter was first visited in 1981 by Johnny Faulkner of the Daniel Boone National Forest, who noted that it was heavily looted. An archaeological survey of the site was conducted by U.S. Forest Service personnel Faulkner and Cecil Ison in 1992. Faulkner noted that the shelter looked about the same as it had in 1981, indicating that little additional looting had taken place in the intervening years.

Faulkner and Ison collected artifacts at that time from the site surface and an unknown number of screened shovel test probes in the looters' backdirt (Figure 2). Shovel Test Probe 1 was not excavated in the backdirt. It documented the possible presence of intact deposits. Neither human remains nor features were discovered during these investigations (OSA Site Form 1992).

The site was visited again by U.S. Forest Service personnel and members of the Kentucky Archaeological Survey in April 2014. More ceramics, specifically large sherds, were recovered from the surface. Smaller sherds and flakes were noted but were not collected.

MATERIALS RECOVERED

Four categories of artifacts were recovered from Lost Image Rockshelter: lithics (chipped stone tools and debitage), ceramics, faunal remains, and charcoal. Historic period artifacts were noted but were not recovered.

Analyzed artifacts were recovered mainly from the surface or from 1992 screened shovel test probes in looters' backdirt. Materials recovered from screened contexts in Shovel Test Probe 1 consisted of a biface, a modified bone fragment and charcoal.

Chipped Stone Artifacts

Methodology. The goals of the lithic analysis were to assess the age and function of the artifacts. These artifacts were collected from surface or screened looters' backdirt, so no stratigraphic information was available to aid in relative age assessment. Therefore, the diagnostic specimens were classified with reference to relevant regional projectile point styles/types based on Justice (1995). All tools were assigned to functional classes (Andrefsky 2009; Maggard 2011; Schlarb 2008).

The lithic artifacts were first separated into tools (formal or informal chipped stone artifacts that were further modified to serve a particular purpose) and debitage (the by-product of chipped stone tool manufacturing). An Olympus Microscope with a 10X lens was used to

examine the tool edge to determine obvious wear or flake modification. Chert types were not identified. Artifacts classed as scrapers were further examined with a protractor to determine the angle of the worked edge(s).

Formal tools are generally those that are intended for long-term and repeated use with a predetermined design (Maggard 2011; Schlarb 2008). These will often display signs of repeated resharpening and/or maintenance, and in some cases are recycled into a completely different object (i.e., from a projectile point to a scraper or drill). Some flakes, due to their desirability, were refined or modified to make their cutting-edge sharper and/or more durable and are, here, classified as formal tools. These flakes showed more regular, purposeful chipping along the cutting edge.

Informal tools are those that are used as they occur, with minimal or no modification. They are often made from flakes recovered from lithic tool manufacturing. These tools are generally used for a specific task and discarded after the task is completed or the artifact becomes no longer useful (Maggard 2011; Schlarb 2008). The cutting edges showed irregular, fine breakage (personal communication, S. Rick Burdin and Eric J. Schlarb 2011).

Debitage was divided into four types for the purpose of this study: 1) primary flakes retain more than 50 percent cortex; 2) secondary flakes display some cortex but less than 50 percent coverage; 3) tertiary flakes including bifacial thinning flakes, exhibiting the edge of a biface, lack cortex and are produced during the final stages of artifact manufacture or during artifact resharpening, and 4) blocky shatter consisting of angular lithic fragments that lack a bulb of percussion and therefore cannot be called true flakes. Also present was one core. Cores are generally large chunks of chert or cobbles that have been used as source material for the manufacture of chipped stone artifacts.

Lithic Assemblage. A total of 125 chipped stone artifacts were collected (Table 1). The majority (88.0 percent) of lithic artifacts were classified as debitage. None could be classified as a primary flake. There was a total of seven (6.4 percent) secondary flakes and 83 (75.5 percent) bifacial thinning flakes. Twenty (18.1 percent) were classified as blocky shatter. One artifact represented an exhausted core (Eric J. Schlarb, personal communication 2013). This is a fairly large cobble (304g).

Table 1. Lithic Artifact Frequencies.

Categories	Freq.	Percent
Tools		
Informal		
Utilized Flakes	4	3.2
Intentionally Modified Flakes	2	1.6
Formal		
Uniface Fragment	1	0.8
Biface	1	0.8
Biface Fragments	3	2.4
Projectile Points	2	1.6
Projectile Point Fragments	1	0.8
Subtotal	*14*	*11.2*
Debitage		
Flakes		
Secondary Flakes	7	5.6
Bifacial Thinning Flakes	83	66.4
Blocky Shatter	20	16.0
Cores		
Exhausted Core	1	0.8
Subtotal	111	88.8
Total	**125**	**100.0**

Of the 14 chipped stone tools recovered, four were informal utilized flakes, of which two exhibited retouched edges. A variety of artifacts represent the formal tool category consisting of one uniface scraper, one biface, three biface fragments, two projectile points, and one projectile point fragment.

Most of the recovered formal tool artifacts were not diagnostic by themselves, as scrapers and bifaces could represent most any time period. The angle of the scraper edge was greater than 50 percent and thus was most likely used on wood or bone (Schlarb 2008; Wilmsen 1968). Little can be said about the biface and biface fragments.

Two nearly complete projectile points and one broken specimen were recovered from Lost Image Rockshelter (Figure 5a, c-d). These artifacts span a temporal range from the Late Woodland period through the early Fort Ancient period. The Late Woodland period is represented by a Jack's Reef Corner Notched projectile point. Along with Jack's Reef Pentagonal points, Jack's

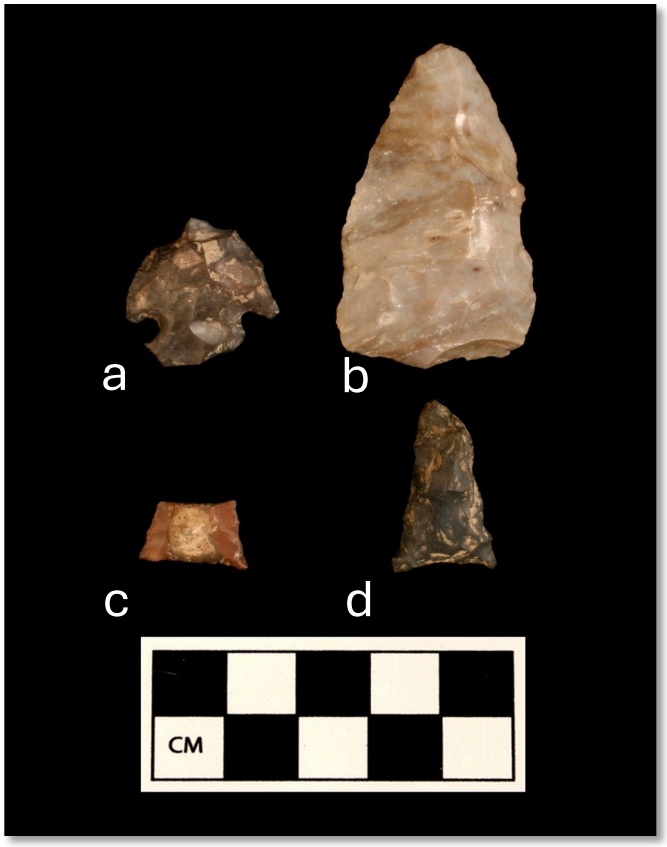

Figure 5. Formal Tools: a, Jack's Reef Corner Notched; b, biface; c-d, Madison Triangular (c - Type 3.1 Fine Triangular; d - Type 2 Fine Triangular).

Reef Corner Notched points are considered examples of the first true arrowheads and an indication of the development of the bow and arrow. Jack's Reef Corner Notched points occur throughout most of the northern United States: from New England south and west into Tennessee and a small portion of northern Alabama (Justice 1995:217). Jack's Reef points are found throughout much of Kentucky (Applegate 2008:374; Justice 1995:219). Dates for these points in Kentucky are approximately A.D. 500 to A.D. 900 but have been found at Kentucky sites dating as late as A.D. 1200 (Applegate 2008:409).

The two Fort Ancient period triangular projectile points are examples of Madison Triangular points. Madison Triangular projectile points occur throughout most of the Eastern United States and date from A.D. 800 into the historic period in some areas (Justice 1995:227). Justice (1995:224) groups Madison, Levanna, and Hamilton Incurvate points together and assigns them to his Late Woodland/Mississippian group. In some areas of Ohio, Levanna, Hamilton, and Madison points co-occur with Jack's Reef points (Morton 1989:62).

Railey (1992) classified triangular projectile points recovered from Fort Ancient sites in northeastern Kentucky according to their morphological attributes. Railey's (1992:156) Type 2 Fine Triangular: Flared Base points correspond to Justice's (1995) Madison Triangular point classification, and date to the early Fort Ancient period (A.D. 1000-1200). More recent research

has shown that Type 2 Fine Triangular points and the subsequently defined Type 3.1 Fine Triangular: Finely Serrated points are among the earliest triangular points produced in central Kentucky (Henderson 2008:742-743; Pollack et al. 2012). The triangular points from Lost Image were assigned to Type 2 and Type 3.1, and date to the early Fort Ancient period (A.D. 1000-1200).

Discussion. The activities that took place at Lost Image Rockshelter are difficult to determine from the lithic artifacts alone, due to small sample size and low artifact diversity. However, some general statements can be made.

The majority of flakes were bifacial thinning flakes, indicating that they were the by-product of resharpening or the final stage of biface tool thinning. The total lack of primary flakes and the paucity of secondary flakes suggest that while some preform manufacturing took place (Eric J. Schlarb, personal communication, 2013), Native knappers brought mainly complete chipped stone tools int the shelter, with the actual manufacturing accomplished in some other location.

The proximity of known chert outcrops and the availability of chert as cobbles in nearby creeks and streams cannot explain why no primary flakes and very few secondary flakes are present in the site assemblage. Native knappers had available local chert resources. Limestone outcrops containing chert deposits are present in the area. Within the Newman Limestone, three types of chert would have been available to Native flintknappers. Paoli chert is the most common nearby chert to Lost Image Rockshelter, and both Haney and St. Louis chert can be found within a few kilometers of the site (Meadows 1977). Perhaps the lack of primary flakes and paucity of secondary flakes is due to sampling bias. Additional research at Lost Image, identification of chert types represented in the assemblage, and a comparison to the chert types available in the surrounding area would help address these issues.

Lost Image Rockshelter's history of occupation using temporally diagnostic tools is more straightforward. Despite the fact that few examples were recovered, they are exclusively arrowheads. This suggests that Lost Image Rockshelter began to be used during the Late Woodland period. While Jack's Reef Corner Notched points date A.D. 500-900 in Kentucky, their use can extend to as late as A.D. 1200 (Applegate 2008:409). They are, however, more common in the Late Woodland period. The Madison points from Lost Image date early in the Fort Ancient period (A.D. 1000-1200; Pollack et al. 2012). Given the types of points recovered from Lost Image Rockshelter, it is possible that its period of occupation may date to the Late Woodland/early Fort Ancient and may be related in some way to Jack's Reef Horizon/Intrusive Mound Complex.

Examination of existing literature conducted during this study indicates that Intrusive Mound Complex sites have been identified only in southern Ohio, although there is limited evidence of the complex in far western Pennsylvania (McConaughy 2015b, 2020; Redmond 2013; (Seeman 1992:43; Seeman and Dancey 2000:592-594). Sites excavated in western Pennsylvania in the late 1800s (McConaughy 2015a) and site reports from northern West Virginia (Bache and Satterthwaite 1930) describe intrusive artifacts recovered from mounds in those locations. The Intrusive Mound Complex may have extended into Kentucky and other parts of West Virginia, as well as further north in Ohio (Pacheco et al. 2009; Halsey and Brashler 2013; Henderson 2005:143). This may be due, in part, to the poor understanding of the complex and the relatively

late introduction of the nomenclature. Intrusive Mound sites are noted for their Jack's Reef points as well as Raccoon Notched points and Hamilton Incurvate points. Intrusive Mound Complex dates from approximately A.D. 700 to A.D. 1000, like the Jack's Reef Horizon. Currently, neither the Jack's Reef Horizon nor the Intrusive Mound Complex have been formally described for Kentucky (Applegate 2008, but cf. Pollack and Henderson 2000:631-632). Given the types of points recovered from Lost Image Rockshelter, it is possible that its period of occupation may be related in some way to the Intrusive Mound Complex or the Jack's Reef Horizon.

Ceramics

Methodology. Ceramic analysis methods followed those outlined in Henderson (1988) and Turnbow and Henderson (1992) but were tailored to address the research goals of this study.

A total of 385 sherds were recovered from the surface or from screened looters' backdirt at Lost Image Rockshelter (Table 2). Only sherds that measured greater than 4 cm^2 and which were not spalled were analyzed (n=288). All diagnostic sherds (e.g., rims and decorated sherds), regardless of size, were analyzed. The assemblage consists primarily of body sherds (n=246; 85.1 percent), although examples of neck (n=15; 5.2 percent), rim (n=23; 8 percent), and basal sherds (n=4; 1.7 percent) were present.

Table 2. Ceramic Artifact Frequencies.

Ceramic Ware Groups/Categories	Freq.	Percent
Limestone Tempered		
Cordmarked	204	70.8
Plain	6	2.1
Subtotal	210	72.9
Mixed Limestone and Shell Tempered		
Plain	7	2.4
Cordmarked	1	0.3
Subtotal	8	2.7
Sandstone Tempered		
Cordmarked	63	21.9
Plain	2	0.7
Subtotal	65	22.6
Quartz Tempered		
Cordmarked	4	1.4
Subtotal	4	1.4
Fired Clay Tempered		
Cordmarked	1	0.3
Subtotal	1	0.3
Total Analyzed Sherds	**288**	**100.0**
Total Unanalyzed (sherds < 4 cm2)	**97**	
Grand Total	**385**	

All sherds were analyzed for fragment type (body sherd, neck sherd, rim sherd, basal sherd), exterior and interior color, exterior and interior surface treatment, cordmark condition, twist, temper, paste inclusions, thickness, and size. Additional information, where relevant, was collected for necks, rims, and decorated sherds: cordmark orientation, rim orientation, lip shape, vessel form, rimstrip/rimfold characteristics, rim thickness, lip thickness, vessel orifice and percent of orifice represented, decoration, and decoration location. Minimum number of vessels (MNV) were calculated for each ware group.

Sherds were visually examined to determine color and surface treatment. For plain matte sherds, the continuum ranged from well-smoothed, to smoothed, to poorly smoothed, to eroded. Well-smoothed surfaces were clear and even, while smoothed surfaces had some evidence of smoothing lines. Poorly smoothed sherds exhibited scratches, dents, trailed lines, and pits. Some of these could have been caused by temper particles being drug along the surface during smoothing. Eroded sherds showed signs of wear and had minor amounts of spalling. Sherds that were cordmarked were classified as either cordmarked or smoothed-over cordmarked. Smoothed over cordmarked sherds showed evidence of smoothing after the cordage was applied. In order to determine cordage twist (on exteriors, rimstrip/rimfolds, or lips), impressions were taken with Sculpey (a modeling clay that can be reused repeatedly and hardened by baking in an oven), and twist direction was then determined from the cast.

Information on temper particle type, shape, size, and density in the paste was noted for each analyzed specimen. In some cases, it was difficult to distinguish limestone temper from sandstone temper when limestone particles were extant. Particle shape was also used to distinguish limestone temper from sandstone temper: limestone particles were more angular or subangular, while sandstone particles were more rounded and finer-grained. And since limestone temper can leach out of ceramics, but sandstone temper generally does not, specimens with angular holes in the paste, by definition, were assigned to the limestone tempered ware group. Temper size was based on the Wentworth Scale (Wentworth 1922, 1933).

Minor amounts of other aplastics – hematite/manganese, sand, quartz, and tiny chert flakes – also occurred in the paste of some specimens. These were considered natural inclusions due to their low frequency of occurrence (Rice 1987:410). Information on inclusion type was noted for each analyzed specimen.

Some specimens had both limestone and shell particles in the paste. Both generally were leached out, but in shape, they present very differently in the paste: angular to subangular for the former and platy for the latter. While shell can be found naturally in clay, particularly in clay recovered from creek- or riverbanks (Rice 1987:410), the small, finely crushed shell particles in these specimens were considered temper. The use of shell as temper is a significant temporal indicator (Applegate 2008:341), so these specimens were considered mixed tempered and were assigned to a separate ware group.

The range in body sherd thickness within the site's ceramic assemblage appeared to be correlated with other ceramic attributes (rimstrip/rimfolds on thick-walled rim sherds and cord-wrapped dowel decoration), suggesting the presence of multiple ceramic series within the non-shell tempered ware groups. Therefore, body sherds were assigned to different ceramic series

on the basis of thickness. Those measuring < 8.0 mm were assigned to the Newtown Series. Those measuring ≥ 8.0 mm and < 10.0 mm were assigned to a new, provisional Chimney Top Ceramic Series (see Gray 2023: B.4-B.6).

Additional information, where relevant, was collected for necks, rims, and decorated sherds. For rim sherds and neck sherds for which orientation was unequivocal, information was collected on cordmark orientation relative to the lip. Rim orientation, lip shape, and vessel form were recorded using categories developed for the Kentucky Fort Ancient Research Project (Turnbow and Henderson 1992:297-298, 336-338) but modified for use in this study.

Any rim modifications were noted and described. It was noted whether the modification had been added on (considered a rimstrip) or if the rim had been folded over (considered a rimfold). The shape of the base of the rimstrip/rimfold was noted (straight or scalloped), and width and thickness measurements (taken at the thickest point) were taken. Surface treatment on rimstrip/rimfolds was described separately from a specimen's exterior surface treatment.

Thickness measurement on rims was taken at the thickest spot at the lip (lip thickness) and 1 cm below the lip (rim thickness). Orifice diameter and percent of orifice represented were measured for all rim sherds large enough for reliable measurement using a concentric circles chart graduated in 2 cm increments and 5-degree arcs (Rice 1987:223). No measurements were attempted for very small rims, for larger rims broken in such a way that the curve was too small for reliable measurement, or if vessel form and rim orientation could not be determined.

Decoration type (i.e., trailed line, cordmarking on lip, or dowel impression) and location (whether on the rim, lip, or neck) was noted and described.

Minimum number of vessels (MNV) was estimated for each ware group. Attributes of decoration, rim orientation, lip shape, and rimstrip/rimfold category were considered, along with other characteristics such as rim diameter and maximum thickness measurements for rim, lip, and rimstrip/rimfold. Prior to final MNV determination, the specimens themselves were reexamined (see Egloff 1973 for a discussion concerning how to determine the minimum number of vessels).

Ceramic Ware Group Descriptions

Ceramics from Lost Image Rockshelter were assigned to five ware groups based on temper type and to eight ceramic categories based on exterior surface treatment (Table 2). The Limestone Tempered Ware Group was the largest (n=210; 72.9 percent), followed by the Sandstone Tempered Ware Group (n=65; 22.6 percent). Three other ware groups occurred in smaller amounts: Mixed Limestone and Shell Tempered (n=8; 2.8 percent), Quartz Tempered (n=4; 1.4 percent), and Fired Clay Tempered (n=1; 0.3 percent). Ware group descriptions are presented below. Consult Gray (2023: B.1-B.7 for the detailed ceramic type descriptions).

Limestone Tempered Ware Group. Newtown Ceramic Series; Chimney Top Ceramic Series) n=210: 180 (85.7 percent) body sherds, 12 (5.7 percent) neck sherds, 15 (7.1 percent) rim sherds, 3 (1.5 percent) basal sherds (Figure 6).

Figure 6. Limestone Tempered Cordmarked Sherds: a) 15Po303/1; b) 15Po303/273 with cordmarked lip; c) 15Po303/7 with cordmarked lip; d) 15Po303/14 with cordmarked lip.

Limestone temper particles in this ware group were angular to subangular in shape and generally uniform in shape and size. Most tended toward medium-sized on the Wentworth scale. The specimens exhibited temper particles that had either leached away or were in the process of leaching away.

The paste was fairly clean. Only 73 (34.8 percent) sherds had varying amounts of inclusions. Hematite/manganese concretions were the most common, followed by sand. Small quantities of rounded sandstone particles were noted in a few sherds. Due to their low frequency of occurrence and shape, however, they were considered natural paste inclusions.

The majority (n=125; 59.5 percent) were various shades of brown, followed by gray (n=70; 33.4 percent) and orange (no=15; 7.1 percent). Only a few sherds showed any sign of blackening due to fire. Some sherd exteriors exhibited several different colors. This could have been caused by exposure to low heat, the presence or absence of oxygen during firing, or by unknown post-depositional factors. Interior colors were similar to exterior colors.

The exterior surfaces of a majority of the sherds (n=204; 97.1 percent) were cordmarked. Five specimens (2.4 percent) were smoothed plain matte and one (0.5 percent) was well-smoothed plain matte. Cordage impressions were divided fairly equally between small, fine cords and large, thicker, "chunky" cords. Some specimens exhibited crossing cords. Cordmarking on rims was oriented perpendicular to the lip. Twist could be determined for 123 specimens: 72 were S-twist (58.5 percent) and 51 were Z-twist (41.5 percent).

Most interior surfaces were smoothed plain matte (n=149; 70.9 percent) or well-smoothed plain matte (n=52; 24.8 percent). Only a few were poorly smoothed plain matte (n=5; 2.4 percent) or eroded smooth (n=4; 1.9 percent).

Body sherd thickness ranged from 4.09 to 9.97 mm. The mean thickness was 7.04 mm, and the median thickness was 7.35 mm. Neck sherd thickness ranged from 6.99 to 9.10 mm, with a mean of 8.06 mm and a median of 7.69 mm. One rounded specimen, which measured 12.71 mm thick, was classified as a base. Two other sherds due to their wall thickness (11.05 and 10.23 mm, respectively) were also considered bases. Together, these basal sherds ranged in thickness from 10.23 to 12.71 mm.

Decoration (n=11; 73.3 percent) was present only on rim sherds. Four cordmarked rims (three were likely fragments of the same vessel) had cord-wrapped dowel impressions on thickened rimstrip/rimfolds (Figure 7). One rim had a large spall on the exterior, but enough of the specimen remained to see the dowel impressions. Dowel impression orientation was left oblique in relation to the lip. Median dowel width was 10.55 mm. Space between the dowel impressions ranged from 8.79 to 9.37 mm. Each dowel impression measured roughly 4.5 mm deep. The width of the cordage wrapped around the dowels was roughly 2.3 mm, and twist could be determined for three specimens: it was Z-twist. Cordmarking on lips (n=7; 46.7 percent) was the other type of decoration (Figure 7). When identifiable, cordage twist was S-twist (n=3) or Z-twist (n=2).

Figure 7. Cord-wrapped Dowel-impressed Thickened Rimstrip/Rimfold on Rim.

A total of 15 rims was assigned to the Limestone Tempered ware group. Lip shape could be determined for all but one specimen: 12 were flat to flat-rounded, and two were rounded. Rim orientation was mainly direct (n=8). The remaining four specimens were slightly incurvate (n=3) or outslanting (n=1). Rim orientation for three specimens could not be determined. Rim thickness ranged from 5.46 to 8.44 mm, with a mean of 7.24 mm and a median of 7.25 mm. Excluding those with rimstrip/rimfolds, lip thickness ranged from 5.52 to 8.73 mm, with a mean of 7.08 mm and a median of 7.05 mm.

Five rims exhibited rimstrip/rimfolds (Figure 8i). It appears that the rimstrip/rimfolds were applied evenly, however, due to the application of the dowel, the dowel-impressed rimstrip/rimfolds exhibited a scalloped appearance at the rimstrip/rimfold base. Lips on these rims are flat to flat/rounded. The rimstrip/rimfolds are wedge-shaped, with the lower margins being thicker. Rimstrip/rimfold thickness ranged from 6.55 to 10.71 mm, with a mean of 9.12 mm and a median of 10.27 mm. Rimstrip/rimfold width ranged from 8.21 to 26.50 mm, with a mean of 19.33 mm and a median of 26.20 mm.

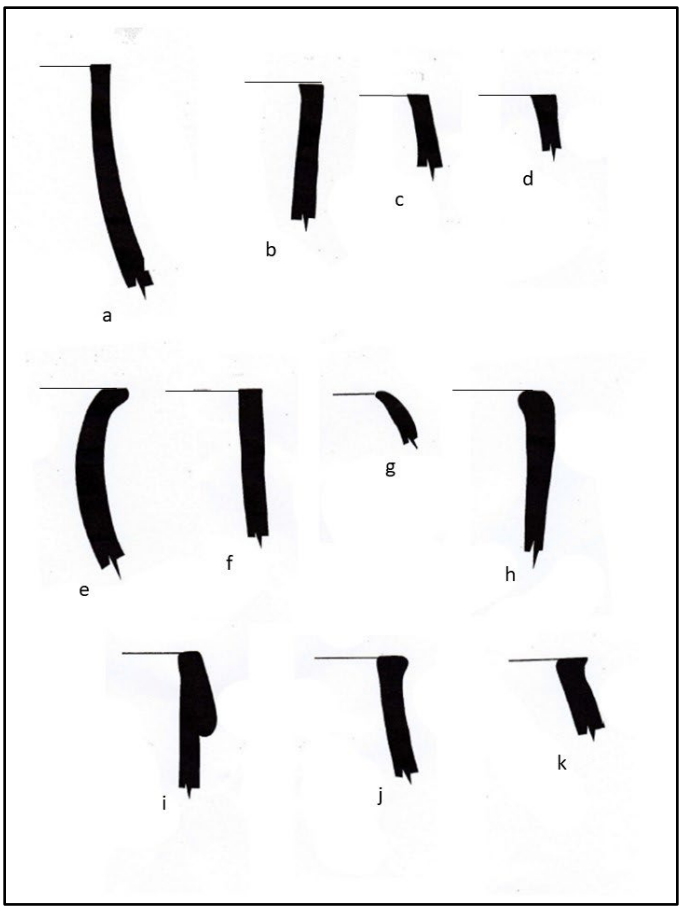

Figure 8. Rim Profiles: a-e) Limestone Tempered Cordmarked – 15Po303/1, 15Po303/3, 15Po303/21, 15Po303/22, 15Po303/273; f-g) Sandstone Tempered Cordmarked – 15Po303/8, 15Po303/24; h) Limestone and Shell Tempered Plain – 15Po303/5; i-j) Limestone Tempered Cordmarked – 15Po303/9, 15Po303/7&18; k) Sandstone Tempered Cordmarked – 15Po303/14.

Three rimstrip/rimfolds were decorated with dowel impressions (see above). These rimstrip/rimfolds measured 19.2 mm wide and had a maximum thickness of 10.71 mm.

Vessel orifice diameter could be measured for nine rims. It ranged from 12 cm to 24 cm, with a mean of 18.9 cm and a median of 18 cm. Diameter ranged from 18 cm to 24 cm, with a mean of 21 cm, for the six direct rims for which diameter could be measured. One slightly outslanting rim had a diameter of 14 cm. Two slightly incurvate rims had a diameter of 12 cm and 18 cm, respectively.

Based on overall sherd characteristics, the minimum number of vessels represented within the Limestone Tempered Ware Group is five.

Sandstone Tempered Ware Group. (Newtown Ceramic Series, Chimney Top Ceramic Series) n=65: 54 (83.14.6 percent) body sherds, 3 neck sherds (5 percent), 7 rim sherds (10.8 percent), and 1 (1.7 percent) basal sherd (Figure 9).

Figure 9. Sandstone Tempered Rim with Cordmarked Lip

These sherds contained various amounts of rounded to subrounded sandstone particles which were medium in size based on the Wentworth scale. In most cases, the paste was sandy.

A few specimens contained additional paste inclusions (n=21; 32.3 percent). These were generally quartz particles or hematite/manganese concretions in roughly equal quantities. Three specimens assigned to this ware group contained tiny chert flakes. Because the flakes measured less than 2 mm in size and were very few in number, they were considered paste inclusions.

Exterior color ranged from shades of brown to orange, with the majority (n=40, 66.7 percent) exhibiting various shades of brown. Seventeen sherds were gray, and three sherds were various shades of orange. Interior color was similar to the exterior color.

Exterior surfaces of a majority of the sherds (n=63, 96.9 percent) were cordmarked Only two (3.1 percent) were smoothed, plain matte. Cordmarking ranged from fine cords to large, thicker, "chunky" cords. Some specimens exhibited crossing cords. Cordmarking on rims was oriented perpendicular to the lip on four specimens, left oblique on one, and right oblique on another. Twist could be determined for 33 specimens: 22 were S-twist (66.6 percent) and 11 were Z-twist (33.4 percent).

Most interior surfaces were smoothed plain matte (n=49; 75.4 percent) or well-smoothed plain matte (n=15; 23.1 percent). Only one was eroded smoothed (1.9 percent).

Body sherd thickness ranged from 3.54 to 9.28 mm, with a mean of 6.88 mm and a median of 7.21 mm. Neck thickness ranged from 6.34 to 9.83 mm, with a mean of 8.16 mm. One sherd measured 11.28 mm thick and, due to its extreme thickness, was considered a basal sherd.

Seven rims were assigned to this ware group. Lips were flat or flat-rounded. Two of the rims were direct, three were incurvate, and one was outslanting. The remaining rim was too small to determine lip shape or rim form. Rim thickness ranged from 4.83 to 8.27 mm, with a mean of

6.71mm and a median of 6.99mm. Lip thickness ranged from 4.25 to 9.16 mm with a mean of 6.71 mm and a median of 6.60 mm. Orifice diameter for the two measurable rims (one was direct, one was slightly incurvate) was 14 cm.

A total of five rims (71.4 percent) were decorated. Two rims had cord-wrapped dowel impressions oriented obliquely to the lip. Cordage twist on one specimen was Z-twist. Twist could not be determined for the other rim. The remaining three rims had cordmarked lips (Figure 9). The cordmarking was oriented perpendicular to the rim. Cordage twist could not be determined.

The minimum number of vessels represented in this ware group is three.

Mixed Limestone and Shell Tempered Ware Group. (Jessamine Series) n=8: 6 (75 percent) body sherds, 2 (25 percent) rims (Figure 10).

Figure 10. Decorated Limestone and Shell Tempered Plain Rim.

These specimens were tempered with a mixture of limestone and shell. Limestone, by far, was the predominate temper. The limestone particles in these specimens were no different from those present in the Limestone Tempered Ware Group: particles were angular to subangular in shape; generally uniform in shape as well as size; and most tended toward medium-sized on the Wentworth scale. The shell temper was represented by small platy voids left when the particles leached out of the sherd. Most of these voids were 1 mm or less in size, while the few shell particles that remained were in the medium range on the Wentworth scale. Due to small particle size and temper leaching, it was not possible to determine whether the shell temper derived from freshwater mussels or snails. However, currently there is no evidence of snail shells used as ceramic temper in the Red River Gorge or surrounding area during the pre-contact period. The paste was fairly clean, although half of the sherds had varying amounts of hematite/manganese concretion inclusions.

The exteriors of seven sherds were smoothed, plain matte, and one sherd, a body sherd, was smoothed-over cordmarked. Twist could not be determined. Interior surface treatment on seven of the sherds was smoothed plain matte. One sherd had a well-smoothed plain matte interior.

The color of the exterior surfaces and interior surfaces ranged from brown to orange, with the majority (n=5, 62.5 percent) being shades of brown. Of the remaining, two (25 percent) were orange and one (12.5 percent) was gray. Body sherd thickness ranged from 7.70 to 9.92 mm, with a mean of 9.14 mm and a median of 9.14 mm.

Decoration was observed only on two (12.5 percent) rim sherds consisting of shallow, obliquely trailed lines extending from the lip on sherd exteriors. The total length of the lines could not be determined due to the specimens' fragmentary nature. The lines measured approximately 1 mm wide and 0.5 mm deep. One specimen exhibited three lines while the other showed only a single line. On the former, the lines appeared to form a "V" shape. Although these specimens may derive from the same vessel, they could not be refitted.

Lip shape was flat to flat-rounded (Figure 10). Rim orientation was slightly incurvate. Rim thickness was 7.50- or 7.63-mm. Lip thickness was 8.50- or 9.91-mm. Vessel orifice diameter for both rims was 12 cm.

Based on overall characteristics within this ware group, it was determined that the minimum number of vessels represented is one.

Quartz Tempered Ware Group. (Newtown Ceramic Series, Chimney Top Ceramic Series) n=4: 4 body sherds. Not Illustrated

These four body sherds were tempered with angular grains of quartz. These particles were generally larger and somewhat less rounded than the quartz inclusions present in the Sandstone Tempered Ware Group specimens. On the Wentworth scale, they were fine to coarse. The paste was fairly clean. Only one specimen contained any inclusions: hematite/manganese concretions.

Exterior and interior surface color was the same: three sherds were medium gray, and the remaining specimen was reddish-brown. All four specimens had cordmarked exteriors. Cordage impressions were worn, and one specimen had crossing cordmarks. For two specimens, twist could be defined. They were S-twist. Three sherds had smoothed, plain matte interiors, while the fourth had a well-smoothed plain matte interior. Body sherd thickness ranged from 7.23 to 9.98 mm, with a mean of 8.15 mm.

The minimum number of quartz tempered vessels is two.

Fired Clay Tempered Ware Group. (Newtown Ceramic Series) n=1: 1 body sherd (Not illustrated).

This small body sherd was tempered with fine-grained, rounded clay fragments. No temper was noted in these fragments. The paste had no inclusions. The specimen had a light

brown cordmarked exterior. Twist could not be identified. The medium brown interior surface was smooth plain matte. The specimen was fairly thin, measuring 4.23 mm.

The minimum number of fired clay tempered vessels is one.

Summary

The Lost Image Rockshelter ceramic assemblage consists of 385 sherds, 288 of which were analyzed (Table 2). Most were body sherds (n=246; 85.4 percent). Overall sherd size in the analyzed assemblage ranged from 2 cm2 to 47 cm2. The majority of sherds (n=214; 74.3 percent) measured less than 10 cm2. Limestone temper (n=210; 72.9 percent) is the most common; sandstone temper (n=65; 22.6 percent) is a distant second. The remaining 13 sherds were either limestone and shell tempered, quartz tempered, or fired clay tempered.

Limestone and sandstone for temper would have been locally available to the Lost Image Rockshelter residents. Land snails and freshwater mussel shell are common throughout the Red River Gorge and so were readily available. The source of the quartz likely was local streambeds. The fired clay temper could have been made from leftover clay particles from ceramic manufacturing. Clay is readily available in the Red River Gorge. It can be present along creek banks and outcrops (Anderson and Dever 2001; Carey 2007; Rice 1987:425).

The paste of most sherds was fairly clean. Paste inclusions consisted mainly of hematite/manganese concretions and quartz particles. Sandstone tempered sherds tended to have a sandy paste.

Although few sherds could be crossmended, overall characteristics suggest that only a few vessels are represented in this assemblage. The minimum number of 12 vessels calculated for Lost Image Rockshelter also supports this observation.

The assemblage is overwhelmingly cordmarked (n=273; 94.8 percent). Cordmarking included examples of large, thicker, “chunky” cords as well as finer cords, and this variation occurred even on the same specimen. There were several cases of crossing cords. Although some sherds had well-worn cordmarked exteriors, only two examples were considered to exhibit smoothed-over cordmarking exteriors. Cordage twist was identified for 158 specimens: 96 (60.8 percent) sherds exhibited S-twist cordage and 62 (39.2 percent) exhibited Z-twist cordage. Cordmark orientation on rims generally was oriented perpendicular to the lip; only two examples of oblique cordmarks were identified.

Decoration (n=17; 0.06 percent of total analyzed sherds) occurred exclusively on rim sherds. Decoration consisted of cordmarking on the lip (n=12), cord-wrapped dowel impressions on rimstrip/rimfolds (n=6), and trailed lines (n=2). Three of these rim sherds (likely fragments of the same vessel) exhibited both cordmarked lips and cord-wrapped dowel impressions oriented obliquely on thickened rimstrip/rimfolds.

Rim orientation was about evenly divided between direct (n=11) and incurvate (n=9) examples, although one outslanting example was present. The remaining three rims were too small to allow for an accurate determination of rim orientation. Lip shape was almost exclusively flat to flat-rounded. Orifice diameter could be determined for 13 of the 24 rims. It ranged from 12 to 24 cm, with a mean of 15.7 cm. Orifice diameter for the direct rims ranged from 14 cm to 24 cm with a mean of 20 cm. The orifice diameter for the incurvate rims ranged from 12 cm to 18 cm with a mean of 13.6 cm. The outslanting rim had an orifice diameter of 14 cm. Orifice diameter for the Limestone Tempered Ware Group was the largest, with a mean of 18.9 cm, followed by the Sandstone Tempered Ware Group (orifice diameter of 14 cm) and the Mixed Limestone and Shell Tempered Ware Group (orifice diameter of 12 cm).

Neither vessel shape, function, nor form could be determined due to the fragmentary nature of the collection and the limited number of rims. No complete, or nearly complete, vessels were recovered. Nevertheless, given the attributes of these specimens, they are most likely fragments from general-purpose cooking vessels.

REGIONAL COMPARISON

To assign ceramic series and types for the Lost Image Rockshelter assemblage required reviewing defined types dating to the Late Woodland period through the early Fort Ancient period described for the Red River Gorge, central Kentucky, and the upper Ohio River Valley. This time range was selected based on the diagnostic characteristics of the site's ceramic assemblage, the characteristics of the site's temporally diagnostic chipped stone tool assemblage, and the calibrated age of the acceptable radiocarbon assay secured from the site. Consult Gray (2023: B.1-B.7 for the detailed ceramic type descriptions).

Relevant Ceramic Series and Sites

Late Woodland Period Ceramic Series. Previously defined regional non-shell tempered ceramic series provided comparative data for this study. These included the Early Late Woodland Newtown Ceramic Series, documented for the Red River Gorge region, central and eastern Kentucky, and southern Ohio, as well as the contemporaneous Childers Series from West Virginia.

However, cord-wrapped dowel-impressed decoration on rimstrip/rimfolds – characteristics also present within the Lost Image assemblage – are not attributes of Newtown assemblages. Instead, they are reminiscent of the terminal Late Woodland Woods Series and Parkline Series defined in West Virginia, and certain ceramic characteristics of specimens recovered from Jack's Reef Horizon/Intrusive Mound Complex sites in the middle and upper Ohio Valley. Other sites located in northern Ohio, western Pennsylvania, and Michigan, identified as Jack's Reef Horizon, produced thick-walled, cord-wrapped dowel-impressed sherds. These

regional ceramic series along with the terminal Late Woodland assemblage from the Grayson site and nearby Red River Gorge sites that have produced examples of these ceramics were evaluated for the comparative insights they could provide regarding the unique sherds within the Lost Image assemblage.

Late Middle Woodland/Early Late Woodland – Newtown Series Ceramics. Newtown series ceramics are found in Ohio, Indiana, and Kentucky (Henderson 1988; Huebchen 2006:57; McMichael 1984; Riggs 1998). They generally date from the late Middle Woodland to early Late Woodland Period, roughly A.D. 500-700 (Applegate 2008; Pollack and Henderson 2000). Newtown ceramics represent one of the most common Late Woodland ceramics in central and eastern Kentucky (Applegate 2008:350). They are particularly relevant for the present comparison because several rockshelter sites in the Gorge have produced Newtown ceramics (Applegate 2008:498).

Newtown ceramic temper varies by location and appears to reflect the use of locally available material (Henderson 1988; Huebchen 2006:57; Riggs 1998:307). Evidence also indicates a temporal progression of temper types from limestone to limestone and grit. Both grit tempered and shell tempered Newtown Series ceramics have been recovered from the Ronald Watson Gravel site (15Be249), a terminal Late Woodland site located in Boone County, Kentucky with calibrated dates ranging from A.D 83 to A.D. 1017 (Applegate 2008:486). Rodney Riggs (1998:184-188) identified Newtown ceramics at Sand Ridge (33Ha17) in southwestern Ohio dating as late as A.D. 900, indicating that Newtown ceramics may persist into the terminal Late Woodland period. Riggs (1998:277) suggested that this change in temper types relates to changes in subsistence practices, particularly the increased processing of seed foods. When multiple temper types are present in an area, sociocultural norms and intended vessel usage likely also influenced temper choices.

Rims tend to be moderately outslanting with a constricted orifice. Henderson (1988) noted that incurvate, recurved, and direct rims are also present. Lips are usually flat and rarely thicken or thin to the lip. Decoration on Newtown vessels is not common. When it does occur, it consists of incised lines or red-filming, and cordmarking or notching on the lip (Henderson 1988, McMichael 1984). Rimstrip/rimfolds are not present. Vessels have a semi-conoidal base. Body wall thickness ranges from 3 to 10 mm, with an average of 5-6 mm (McMichael 1984). The main defining characteristic of Newtown ceramics is the angular shoulder on jars.

Rockshelter sites in the Red River Gorge with Newtown Series ceramics include Haystack, Rogers, and Rock Bridge (Applegate 2008). The author examined the ceramics recovered from the Haystack Rockshelter (15Po47). This site produced classic examples (i.e., rims and angular shoulders) of Newtown Series ceramics (Cowan 1979). Based on this comparative data, several Lost Image specimens are very similar to Newtown Series ceramics in temper, surface treatment, sherd thickness, and rim characteristics. Although angular shoulders are absent, at least some of the Lost Image sherds can still be classified as Newtown Series ceramics.

Early Late Woodland – Childers Series Ceramics. Childers Series ceramics from the Childers site (46Ms121) in West Virginia date from about A.D. 400-700, the Late Middle Woodland to the middle of the Late Woodland (O'Malley 1990:699) and are contemporary with Newtown Series

ceramics (Pollack and Henderson 2000:615). The predominant temper is siltstone, followed by limestone. Minor tempers consist of sandstone, sand, quartz, and chert. The paste is usually clean, but small amounts of hematite inclusions may be present. Childers ceramics can be either cordmarked (81 percent) or plain (19 percent). Cordmark orientation on rims is vertical. Most of the cordmarking is S-twist. Vessels commonly have recurved rims and restricted orifices. Lips are generally flat rounded. Vessels exhibit conoidal (pointed) bases. Some jars have high shoulders while others have low shoulders. Decoration is not common, but when it occurs, it consists of incised lines, usually on the neck or shoulder. Most sherds measure between 6 and 8 mm thick (O'Malley 1990).

Ceramics from Lost Image Rockshelter share some characteristics with Childers Series ceramics, such as surface treatment and twist direction. Other key aspects, such as temper, rim orientation, lip shape, decoration, and thickness, contrast substantially. Because of these differences, and because the center of Childers Series manufacture is located roughly 200km east of the site, the ceramics from Lost Image were not assigned to the Childers Series.

Terminal Late Woodland – Woods and Parkline Series Ceramics. Some specimens in the Lost Image Rockshelter ceramic assemblage exhibit characteristics that are not present within the Newtown or Childers series, specifically thick vessel walls and rims with cord-wrapped dowel impressions on thickened rimstrip/rimfolds. These attributes suggest similarities with the terminal Late Woodland Woods Series and Parkline Series ceramics recovered in West Virginia (Kerr 1990; O'Malley 1990). A review of these series is presented here.

The type site for the Woods Ceramic Series is the Woods site (46Ms14) and dates to the latter part of the Late Woodland period: A.D. 700-A.D. 1000 (O'Malley 1990:787). Woods Series ceramics are mostly siltstone tempered (82 percent), although sand tempered and limestone tempered examples are also present. Most specimens have smoothed-over Z-twist cordmarked exteriors with an average body thickness of 7.5 mm. Rims are usually slightly flared and lips are usually rounded. Some decoration, in the form of incising, occurs along the neck. Lips may exhibit notching, slashing or cord-wrapped dowel or paddle-edged cord impressions. A few rim sherds exhibit punctations. There are no thickened rimstrip/rimfolds.

Decoration on Woods Series ceramics includes cord-wrapped dowel or paddle-edged cordmarked impressions on the lip, reminiscent of the examples at Lost Image Rockshelter while other characteristics of Woods Series ceramics are different. The most notable include temper and twist preference, the location of cord-wrapped dowel impressions, and types of decoration. Because of these differences, specimens from Lost Image were not assigned to the Woods Series.

Parkline Series ceramics, defined from the terminal Late Woodland (A.D. 800 to A.D. 1000) Parkline site (46Pu99) located in north-central West Virginia (Kerr 1990), are contemporary with the Woods Series. Parkline ceramics are mainly tempered with siltstone, and plain and cordmarked exteriors occur in roughly equal proportions. Vessel interiors are mostly well-smoothed, and cordage twist is almost always Z-twist. Average body thickness is about 7 mm. Rims are direct or incurvate, with rounded lips that include cordmarked and notched decorations. Cord-wrapped dowel impressions occur on Parkline Series rim sherds, usually at a right oblique

angle to the lip, though perpendicular impressions also occur. No width or depth measurements for the dowel impressions were reported.

Although Parkline Series ceramics share a few traits with the Lost Image sherds, such as– rim orientation and the presence of cord-wrapped dowel decoration on vessel rims – these similarities are outweighed significant differences. Temper is the most obvious difference: Parkline Series ceramics are mostly siltstone tempered, even though limestone was present near the site and thus could have been used for temper (Niquette and Kerr 1990). Parkline temper particles are much larger and paste inclusions are mostly sand or chert, in contrast to the Lost Image ceramics.

Other significant differences – in surface treatment, twist preference, average body sherd thickness, and lip decoration – also exist. For Parkline, rim strips were added to the vessel but then thinned to the same thickness as the body. For the Lost Image specimens, rim strips were added, or rims were folded, and both forms are measurably thicker than the vessel. Because of these differences and the distance between Lost Image Rockshelter and the Parkline site, the Lost Image sherds were not assigned to the Parkline Series ceramics.

Terminal Late Woodland – Jack's Reef Horizon/Intrusive Mound Complex Ceramics. The Jack's Reef Horizon in southern Ohio was first described by Mark Seeman (1992). Its most diagnostic artifacts are Jack's Reef points, the first true arrowheads in the region (see earlier discussion), and characteristically thick-walled cordmarked vessels. To date, no single Jack's Reef Horizon/Intrusive Mound Complex ceramic type has been identified. Comparison of ceramics recovered from Jack's Reef Horizon/Intrusive Mound Complex sites in southern Ohio, western Pennsylvania, and Michigan with those recovered from outside the region and not identified as Intrusive Mound Complex sites is relevant for this study.

Ceramics associated with Jack's Reef Horizon/Intrusive Mound sites are represented by thick-walled, cordmarked vessels, some with thickened rims/rim strips with cordwrapped dowel impressions and rounded lips (Redmond 2013:113). Incising or notching on lips has been noted in a few cases. Other differences, such as rim orientation or the percent of S-twist to Z-twist cordage, might be considered local variations. Several variations have been recovered from sites throughout Ohio, Pennsylvania (Edinburg [36LROOO3] in Redmond 2013), and Michigan (Halsey and Brashler 2013). Some variations have been assigned type names (e.g., Wayne Cordmarked and Gibraltar Cordmarked in the north [see Redmond 2013]), while in southern Ohio, they are referred to, generically, as Jack's Reef Horizon ceramics (Schwarz 2014).

Diagnostic characteristics of the Chimney Top Ceramics Series – thick-walled, cordmarked vessels, some with thickened rimstrip/rimfold with cordwrapped dowel impressions – are similar to the ceramics found within Intrusive Mound sites in southern Ohio. This suggests that the specimens from Lost Image may be related to ceramics from Jack's Reef Horizon/Intrusive Mound Complex sites.

Terminal Late Woodland – Peters Cordmarked Ceramics at the Grayson Site. The ceramic-producing occupation at the Grayson site (15Cr73) in Carter County, located roughly 100km northeast of Lost Image Rockshelter, was dated to the terminal Late Woodland Everman Phase

(A.D. 700-900; Ledbetter et al. 1991; Ledbetter and O'Steen 1992). Its small (n=66; but the accurate total is 69) ceramic assemblage had the potential to provide relevant comparative data for this study since ceramic-producing features at the site also produced Jack's Reef cluster projectile points and calibrated Late Woodland radiocarbon dates (at 2 sigma) that ranged from A.D. 656-986 to A.D. 695-1223 (Applegate 2008: 516, 528).

According to Ledbetter et al. (1991:122-128), crushed sandstone temper predominated (n=50; 75.8 percent), followed by chert (n=8; 12.1 percent; but the accurate total is 11), siltstone (n=5; 7.6 percent) and granitic rock (n=3; 4.5 percent). For specimens large enough to fully analyze, cordmarked surfaces predominated (n=46 out of 48). Twist from dated Late Woodland features was noted as Z-twist. The original analysts indicated that mean body sherd thickness ranged from 6.5 mm (granitic temper) to 7.0/7.1 mm and 7.2 mm (for sandstone and chert tempered specimens, respectively) to 8.4 mm (siltstone temper).

Lips were flat or flat-rounded. Rims were direct and measured less than 8 mm thick. In contrast to the reported lip decoration (Ledbetter et al. 1991:125), the two chert-tempered rims were noted in this reanalysis as exhibiting very subtle, very shallow notches that extended perpendicularly across the lip. These could have been made with a cord-wrapped dowel, but this was very difficult to confirm. No rims with cord-wrapped dowel-impressed thickened rimstrip/rimfolds were recovered from the site or observed within the curated materials.

Noting that the small Grayson site specimens did not fit comfortably into any established ceramic types or series, the original analysts nevertheless assigned them to Peters Cordmarked (Prufer and McKenzie 1966), citing previous researchers' assignment of Late Woodland cordmarked pottery from nearby sites to that type (Ledbetter et al. 1991:127-128). They did not assign the Grayson site ceramics to Newtown Cordmarked, due to the lack of limestone tempered examples, angular shoulders, and the Grayson site's radiocarbon dates. And although the original analysts concurred that the Late Woodland occupations at Woods and Parkline in West Virginia were comparable in time to the Grayson site's Late Woodland occupation, they did not think the ceramic assemblages were comparable. The same can be said for the thick-walled, cord-wrapped dowel-impressed rim sherds from Lost Image Rockshelter.

Nearby Sites in the Red River Gorge

To determine how common thick-walled, cord-wrapped dowel-impressed ceramics are in the Red River Gorge, the author assessed all sites within a 5km radius (198 rockshelters and 55 open sites) listed with the Office of State Archaeology (OSA) database located within 5km radius of Lost Image Rockshelter. Many of these site collections are curated at the William S. Webb Museum of Anthropology. This research represents the first that targets the curated ceramic assemblages from this area, and in many cases, it represents the first critical examination of these sites' ceramic assemblages.

Site forms were examined. Only 66 rockshelters and seven open habitation sites contained artifacts that would justify further identification. Those that had produced only lithics, or only shell tempered ceramics, or those that had produced only a few body sherds (less than 10) were not considered further. This resulted in a sample of 25 rockshelters. No open sites met these criteria.

Other issues also impacted the quality of the data available for study. The degree of excavations, or the lack thereof, affected the quality of information available. Some sites only had an initial site survey with new revisits and thus produced limited numbers of artifacts. This made determining a definitive occupational history for most sites impossible.

Three rockshelters in the site sample – Worth Creech Shelter (15Wo2), Clay Doll Shelter (15Po60), and Site 15Mf147 – did produce cord-wrapped dowel-impressed sherds. The decoration on these specimens was virtually identical to the decoration on the Lost Image Rockshelter examples (Gray 2023: A.1-A.5). The differences were minimal; for example, with respect to dowel impression orientation and rimstrip/rimfold width. This study demonstrated that the cord-wrapped dowel-impressed specimens from Lost Image Rockshelter are not unique in the region.

Comparisons to previously defined relevant regional site ceramic assemblages provided insights for characterizing the Lost Image ceramic assemblage and permitted assignment of some specimens to already defined ceramic series. It was concluded that, despite the lack of angular shoulders, some Lost Image Rockshelter specimens were very similar to Newtown Series ceramics, and they were classified as such (Table 3).

Table 3. Ceramic Series Frequencies.

Ceramic Series	Freq.	Percent
Newtown		
Cordmarked	193	67.0
Plain	6	2.1
Subtotal	199	69.1
Chimney Top		
Cordmarked	79	27.4
Plain	2	0.7
Subtotal	81	28.1
Jessamine		
Plain	7	2.4
Cordmarked	1	0.4
Subtotal	8	2.8
Total	**288**	**100.0**

It was also concluded that the Lost Image Rockshelter ceramic assemblage exhibited a few attributes described for the terminal Late Woodland Woods and Parkline Series ceramics, and to the distinctive, but untyped, terminal Late Woodland ceramics recovered at Jack's Reef Horizon/Intrusive Mound Complex sites – in particular, cord-wrapped dowel decoration and

rimstrip/rimfolds. These attributes suggested that some of the Lost Image specimens may have been manufactured during the terminal Late Woodland period.

Due to the other very significant differences noted between Woods and Parkline Series ceramics, and to the fact that the Jack's Reef Horizon/Intrusive Mound Complex ceramics are so poorly described and untyped, the Lost Image specimens could not be assigned to these or to any other previously defined terminal Late Woodland ceramics. Comparative research within a 5km area of Lost Image identified three rockshelters that had produced rim sherds with thick, cord-wrapped dowel-impressed rimstrip/rimfolds. Therefore, a provisional ceramic series – Chimney Top Ceramic Series – was defined (Gray 2023: B.4-B.6).

Fort Ancient Period Ceramic Series. Mixed shell and limestone tempered sherds from Lost Image Rockshelter suggest that early or middle Fort Ancient period ceramics may be represented in the assemblage. Two early Fort Ancient ceramic series, Jessamine and Beals Run, have been defined for central Kentucky with Jessamine ceramics continuing into the middle Fort Ancient period. Mixed tempered ceramics have also been documented at nearby sites in the Red River Gorge, supporting the possibility of a Fort Ancient presence at Lost Image.

Jessamine Series. Jessamine Series ceramics are the hallmark of the early and middle Fort Ancient periods in central Kentucky (Henderson 1998:134). The type site for Jessamine Series ceramics is the Muir site (15Js86; Turnbow and Sharp 1988), occupied from roughly A.D. 900 to A.D. 1350 (Henderson 2008:762). Jessamine Series ceramics are mostly limestone tempered (75.2 percent). However, mixed limestone and shell tempered (11.2 percent) and shell tempered (3.8 percent) specimens occur. Exterior surfaces are mainly cordmarked (69.9 percent), followed by plain (29.1 percent). Minor exterior surface treatments include check-stamped, fabric-impressed, knot-roughened, and net-impressed examples (Henderson 1998; Sharp and Pollack 1992; Turnbow 1988). Most vessels are jars; however, bowls are present. Rims are usually recurved, or slightly flared and flat-rounded lips predominate. Average body sherd thickness ranges from 7 to 9 mm. Decorated sherds make up less than 20 percent of site assemblages. Decoration is found mostly on the lip, rim, or neck. It consists of cordmarking or notching. Incised or trailed lines may occur on the neck (Turnbow 1988). Appendages on vessels are generally handles and a few lugs are present.

Mixed limestone and shell tempered ceramics have been recovered from sites in the Red River Gorge area, and these may resemble Jessamine Series ceramics, although they were analyzed prior to the definition of the Jessamine Series (Turnbow 1988). Cowan (1976:125; see also Henderson 2008:812) suggested that after A.D. 900, limestone and shell tempered or sandstone and shell tempered ceramics make their appearance in the Gorge area, followed by exclusively shell tempered ceramics after A.D. 1200. Wyss and Wyss (1977:88-91, 239) have suggested that mixed tempered ceramics can be found in the region as late as A.D. 1400. Like Jessamine Series ceramics, these early examples are cordmarked, although plain as well as checked-stamped varieties and some knot-roughened varieties are present (Henderson 2008:764).

Beals Run Series. The early Fort Ancient period Beals Run Ceramic Series has been documented at sites within a restricted area of the Inner Bluegrass Region – the South Elkhorn

drainage (Henderson 2008:767-769, 2010). The Old Springs site (15Fr20) produced the best documented Beals Run Series assemblage (Henderson 1999, 2000). In her detailed attribute comparison (Henderson 2010) of early Fort Ancient Beals Run Series ceramics from Old Springs, and early Fort Ancient Jessamine Series ceramics from Dry Run (15Sc10), Muir (15Js86), and Kentuckiana (15Sc183), Henderson demonstrated how Beals Run ceramics were different from Jessamine Series ceramics. At this point in our understanding, it seems likely that Beals Run ceramics were manufactured somewhat earlier than the earliest Jessamine assemblages or may be contemporary with the earliest Jessamine ceramic assemblages (Henderson 2010).

Beals Run ceramics are distinguished by a variety of rocks crushed for temper (including an enigmatic opaque, noncalcareous aplastic) used alone or in combination; a lack of shell temper; large amounts of paste inclusions, consisting of well-rounded hematite/manganese concretions and/or steinkerns (consolidated mud- or sediment-filled voids left in the limestone bedrock by tiny crinoids and snail shells that deteriorated away long ago); and thick vessel walls (a mean of 8.4 mm at Old Springs and 8.5 mm at the type site: Paddock 9 (15Wd84; Henderson 1997, 2010). Exterior surfaces are overwhelmingly Z-twist cordmarked. This twist preference distinguishes Beals Run ceramics, as it contrasts with central Kentucky's tradition of S-twist cordage preference (Henderson 1998; 2008; Stoner and Henderson 2007; Turnbow 1988). The only vessel forms are jars with slightly incurvate/recurved, direct, or flared rims. Characteristically, decoration is rare and consists of cordmarking or notching on lips; and small, deep punctations or incised lines (Henderson 1997, 2008:768). Beals Run ceramics lack appendages of any kind.

Based on this comparison, the mixed limestone and shell tempered specimens from Lost Image Rockshelter can be classified as Jessamine Series ceramics (Table 3). Despite the contemporaneity of the Beals Run Series and Jessamine Series, none of the ceramics from Lost Image Rockshelter can be assigned to the Beals Run Series.

Discussion. Lost Image Rockshelter ceramic assemblage contains examples of Newtown and Jessamine series ceramics. The majority (n=199, 69.1 percent) are Newtown ceramics with Jessamine Series ceramics accounting for 2.78 percent (n=8; Table 3).

The site's remaining ceramics consist of thick-walled vessels and cord-wrapped dowel-impressed rims, which did not fit comfortably into other regional ceramic series. They may be related in some way to Woods and Parkline Series ceramics and ceramics from Jack's Reef Horizon/Intrusive Mound Complex sites. The recovery of rims with cord-wrapped dowel-impressed thickened rimstrip/rimfolds from three sites within 5km of Lost Image Rockshelter supports the creation of a provisional terminal Late Woodland ceramic series for the Red River Gorge (see Gray 2023: B.4-B.6) – the Chimney Top Ceramic Series – defined for the Red River Gorge and eastern Kentucky. The Chimney Top Series accounts for 81 (28.1 percent) of the analyzed sherds from the site.

Ceramics recovered from Lost Image Rockshelter suggest two possible scenarios for its occupational history. Native peoples may have used the site from the early Late Woodland period to the early Fort Ancient period (periodically between A.D 500/600 and A.D. 1000/1100): intensively from A.D. 500-700, and on a limited basis from A.D. 800 to A.D. 1000-1100.

Alternatively, Native peoples may have used the site during the terminal Late Woodland/early Fort Ancient, i.e., only from 800-1000 AD.

FAUNAL REMAINS

The goal of this analysis was to characterize the faunal remains from the site as to the taxa in the assemblage and thus the animals exploited by the shelter inhabitants. Another goal was to assess the assemblage's taphonomy and characterize the environment surrounding the shelter.

Methodology

The remains were collected from surface or from screened soil from looters' back dirt. Each specimen was assigned to class, counted and weighed, and then element identification and element portion was noted. Where possible, each specimen was assigned a taxon. Specimens were examined for evidence of having been worked, along with cut marks, gnawing, or other taphonomic characteristics, such as burning.

Burning was further classified as either calcined or simply burned black. Calcined bone exhibits a gray to white chalky appearance. Bones that are calcined have been subjected to direct intense heat as opposed to heat associated with roasting or boiling. Bones with flesh still attached would be less likely to become calcined due to lower heat and/or shorter firing duration. The presence of calcined bone is also interpreted as evidence for trash disposal (Roberts et al. 2002:485-494).

Site Discussion

Lost Image Rockshelter is a relatively dry shelter, and thus, the preservation of faunal remains was fairly good. The bones collected showed no obvious signs of deterioration.

The assemblage consisted mostly of mammal bones, with the majority of these being deer. No identifiable small mammal bones (e.g., squirrel, raccoon, and opossum) were recovered. It is likely a matter of collection bias more than lack of human exploitation of these species. Species represented in the Lost Image assemblage suggest that at the time of Native occupation, forest edges and open ranges supporting deer and turkey and wooded uplands attractive to bear existed in the vicinity of the site (United States Department of Agriculture 1993).

Of the large mammal bones, limb bones were the most common, a pattern that may indicate primary butchering occurred in another location. The limited representation of other

identifiable bones, such as rib, skull, and scapula fragments in the collection could be due to collector bias; their post-depositional removal by carnivores; their reuse by site occupants for tools such as awls, scrapers, or soft hammer percussors; or their disposal outside the shelter.

Nearly one-third of the recovered bone at Lost Image Rockshelter had been exposed to fire. The majority (73.7 percent) was calcined from long exposure to direct fire and intense heat, suggesting that cooking or trash disposal occurred at the site (see Roberts et al. 2002). Other burned bones were black, indicating exposure to heat from either boiling or roasting, which requires shorter cooking times and lower heat (Roberts et al. 2002).

Some of the bones showed evidence of rodent or carnivore gnawing. This suggests that these remains were exposed to the elements for some time after disposal. One unidentified mammal bone had been worked and showed evidence for decoration, but it was too small to draw any meaningful inference.

RADIOCARBON DATES

Two samples from Shovel Test Probe 1, located near the inside edge of the berm, were sent to the University of Georgia, Center for Applied Isotope Studies for radiocarbon dating (Stuiver and Reimer 2020; Table 4). This probe appeared to have intact deposits and also produced a complete biface. The samples consisted of one charred wood fragment (species unassessed) and one small, worked, unidentified mammal bone.

Table 4. Radiocarbon Dates.

Lab No.	Material Dated	Age (B. P.)	Calibrated Date (2 sigma)	Median Probability
UGAM-19614	charcoal	4470 +/-25	3336-3210 B.C. 3194-3080 B.C. 3061-3028 B.C.	3227 B.C.
UGAM-19615	bone	1120 +/-25	A.D. 885-992	A.D. 936

The wood charcoal specimen provided a median calibrated date of 3227 B.C. at 2sigma. Because no diagnostic Archaic period artifacts were recovered from the site, this date was not considered acceptable/relevant.

The date from the worked bone specimen had a 2sigma date of A.D. 885-992, with a median probability of A.D. 936. The date returned on this manufactured object fits well into the terminal Late Woodland period and complements the other temporally diagnostic projectile points and ceramics recovered from Lost Image Rockshelter.

SUMMARY AND CONCLUSIONS

Lost Image Rockshelter (15Po303) is an ancient Native American site located along the western edge of the Cumberland Plateau in the Red River Gorge area of northeastern Powell County, Kentucky. A northeast-facing site in the Chimney Top Creek drainage, this rockshelter was first recorded in June 1992 by Daniel Boone National Forest archaeologists, who noted that it had been heavily looted. One shovel test probe revealed the possibility that intact subsurface deposits may still remain. Neither human remains nor features were documented.

Surface collection and limited shovel test probing recovered lithics (chipped stone tools, debitage, Jack's Reef Corner Notched and Madison Triangular projectile points) and limestone tempered, sandstone tempered, and mixed limestone and shell tempered plain and cordmarked sherds. Noteworthy was the recovery of jar rims with thickened, cord-wrapped dowel-impressed rimstrip/rimfolds. Examples of two previously defined regional ceramic series – Newtown, and Jessamine – were identified at the site, along with a provisional ceramic series, the Chimney Top Ceramic Series, defined to account for the thick-walled vessels that had rims with thickened rimstrip/rimfolds decorated with cord-wrapped dowel impressions (Gray 2023: B.4-B.6). The site produced a small faunal assemblage representing animals commonly documented for sites in eastern Kentucky.

Age of Occupation

Diagnostic lithic and ceramic artifacts and the single acceptable radiocarbon date provide evidence for identifying the site's occupational history. These data suggest that, in the broadest sense, Native peoples utilized Lost Image Rockshelter from the late Middle Woodland period to the Middle Fort Ancient period.

Identifying Lost Image as either single or multicomponent is problematic due to overlapping temporal ranges represented in both the ceramic and lithic assemblages. The presence of limestone tempered Newtown to limestone and shell tempered Jessamine ceramics, and projectile points ranging from stemmed Jack's Reef Corner Notched to Madison Triangular points, could support interpreting the site as a multicomponent locale occupied intermittently from the late Middle Woodland/early Late Woodland period to the Early Fort Ancient period.

However, taking into account the potential terminal Late Woodland dates for Newtown ceramics (Applegate 2008:486; Riggs 1998:184-188) and the temporal range for Jessamine ceramics (Henderson 2008:762), and the associated lithic (Applegate 2008:409), an equally compelling argument could be made to consider Lost Image Rockshelter as a single component site occupied continuously from the terminal Late Woodland period into the very early Fort Ancient period.

Regional Culture History Implications

The recovery of thick-walled Chimney Top ceramics and a Jack's Reef Corner Notched projectile point suggests that the site occupants may be culturally affiliated with contemporary Jack's Reef Horizon/Intrusive Mound Complex groups and groups who produced Parkline and Woods ceramics. These data may offer evidence for a possible influx of peoples from the upper Ohio River Valley into the Red River Gorge area (see previous discussion about terminal Late Woodland ceramic series (Kerr 1990; O'Malley 1990; Redmond 2013).

Differences in twist between the site's two Late Woodland ceramic series were documented at Lost Image. Thin-walled, limestone tempered, Newtown Series Ceramic vessels are S-twist, while thick-walled, limestone tempered Chimney Top Ceramic Series with thick rimstrip/rimfolds are S- and Z-twist. A tendency for cordage twist to be passed down through generations has been documented (Albea 2012:40; Maslowski 1996:90; Minar 2001). This pattern suggests that new peoples and new ceramic traditions may have arrived in the Red River Gorge area when arrowheads first appear.

Site Utilization

Due to the lack of comprehensive excavation at Lost Image and the looting the site has experienced, only limited interpretations can be offered for how Native peoples used the site. No hearths, trash pits, storage pits, or burials were documented. The presence of ceramics, as well as the overall pattern of the recovered faunal remains, indicates that some food preparation occurred at the site. Lithic data indicate that only tool resharpening activities occurred. Thus, the rockshelter may have been used only as a temporary or a stopover camp while hunting.

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APPENDIX

CERAMIC SERIES DESCRIPTIONS FOR LOST IMAGE ROCKSHELTER

This appendix presents ceramic type descriptions for the three ceramic series identified for the Lost Image Rockshelter (Table 3). Photographs of examples are presented in Figures 6-7; Figures 9-10. Figure 8 presents rim profiles for these series.

NEWTOWN CERAMIC SERIES

Newtown Cordmarked, Newtown Plain: 199 specimens (179 body sherds, 7 neck sherds, and 13 rim sherds)

Temper: Limestone temper is the most prevalent tempering agent (n=144; 72.4 percent) followed by sandstone (n=51; 25.6 percent), quartz (n=3; 1.5 percent), and fired clay (n=1; 0.5 percent). All temper particles are angular to subangular and can vary in size from .25 mm to over 1 mm. Temper is well distributed within the paste. Very little leaching was noted however when present it was generally the larger limestone temper particles. There were shell tempered specimens assigned to this series from this site.

Paste: The paste ranges from fairly clean to sandy. Naturally occurring inclusions are present in about one-third of the specimens. The most common inclusion is hematite/manganese concretions; however, quartz particles also can be present. Minor inclusions are sand particles and chert particles. Coil breaks are present.

Exterior Surface Treatment: Cordmarking is the most prevalent surface treatment, accounting for over 97 percent (n=193) of the specimens. Smoothed over cordmarked or plain exteriors are rare. Cordmarking varies. It can be thin, fine cords, or large thick cords. Crossing cords are common. S-twist (63.5 percent) cordmarked examples outnumber Z-twist (36.5 percent) cordmarked examples.

Interior Surface Treatment: All interiors are plain matte. They range from smoothed (71.9 percent) to well-smoothed (26.3 percent). A few (2.5 percent) specimens are either eroded or poorly smoothed.

Color: Sherds tend to be light brown to tan in color on both exteriors and interiors. Medium to dark gray specimens exist; a few exhibit a reddish orange color. Some specimens exhibit smudging on the exterior only.

Decoration: Nearly half (n=6) of the 13 lips were decorated. Decoration is present only on the lip. Examples of both S-twist and Z-twist cordmarking on lips is present.

Wall Thickness: Body sherd thickness ranges from 3.54-7.99 mm, with a mean of 6.77 mm and a median of 6.97 mm. Sandstone tempered examples tend to be slightly thinner (mean is 6.63 mm) than limestone tempered examples (mean is 6.87 mm).

Rim: Rims are mainly direct (n=7), however, slightly incurvate (n=5) and outslanting (n=1) examples occur. Rims thin towards the lip. Rim thickness ranges from 4.83 to 8.44 mm, with a mean of 7.18 mm and median of 7.35 mm. Lips are mostly flat to flat-rounded, however a few (n=2) rounded lips are present. Lip thickness ranges from 4.25 to 8.49 mm, with a mean of 6.66 mm and a median of 6.93 mm. Rimstrip/rimfolds (n=2) are rare. One measured 4.84 mm wide, while the other was 9.25 mm wide. The rimfold that was 9.25 mm wide was 6.55 mm thick. The remaining rimfold was spalled and could not be accurately measured.

Neck: Neck thickness ranges from 6.34-7.69 mm with a mean of 7.20 mm and a median of 7.25 mm.

Shoulder: No distinctive angular Newtown shoulder sherds were observed.

Base: None observed.

Vessel Form: No rim sherds were large enough to definitively describe vessel form, however all appear to be jars. Orifice diameter could be determined for six rims. It ranged from 12 cm to 24 cm, with a mean of 16.67 cm and a median of 18 cm.

Appendages: None observed.

Comments: Late Middle Woodland/early Late Woodland Newtown ceramics, defined by McMichael (1965, 1984), are found throughout much of the middle Ohio River Valley (Applegate 2008; 508). They are arguably the most common Late Woodland ceramic series found in central and eastern Kentucky (Pollack and Henderson 2000) and have been recovered at several sites in the Red River Gorge (Applegate 2008). While, usually, limestone tempered, grit tempered as well as shell tempered Newtown Series ceramics have been recovered from the Ronald Watson Gravel site (15Be249), a terminal Late Woodland site located in Boone County, Kentucky. It has also been recovered from Sand Ridge (33Ha17) in southwestern Ohio dating as late as A.D. 900, placing Newtown into the terminal Late Woodland/Early Fort Ancient period.

Table A.1. Ceramic Series Frequencies from Lost Image Rockshelter.

Ceramic Series	Freq.	Percent
Newtown		
Cordmarked	193	67.0
Plain	6	2.1
Total	**199**	**69.1**
Chimney Top		
Cordmarked	79	27.4
Plain	2	0.7
Total	**81**	**28.1**
Jessamine		
Plain	7	2.4
Cordmarked	1	0.4
Total	**8**	**2.8**
Grand Total	**288**	**100.0**

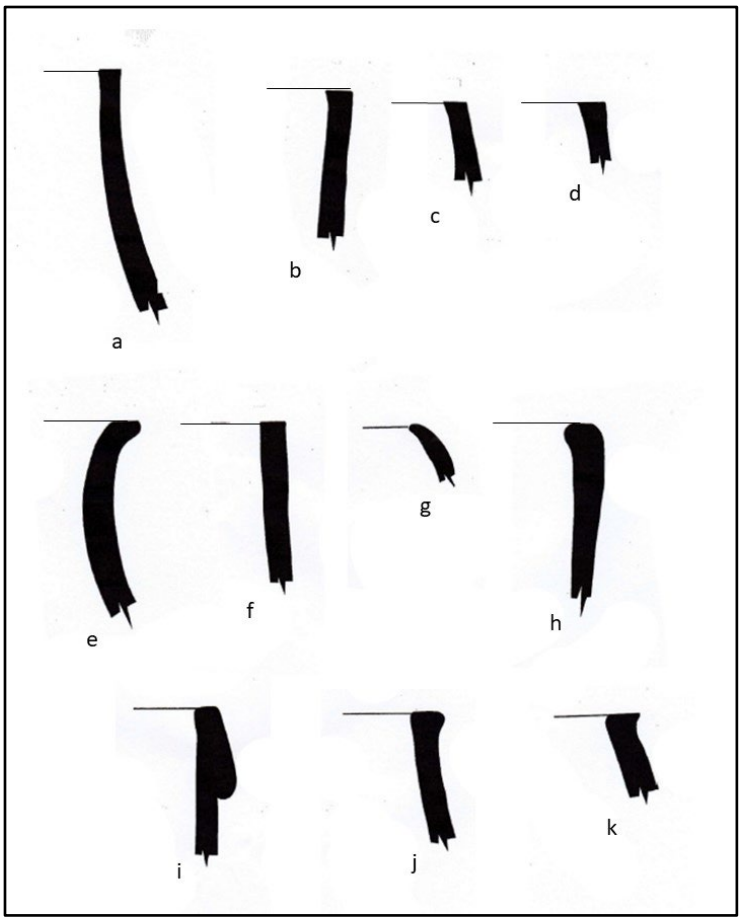

Figure A.2. Ceramic Series Rim Profiles: a-e) Limestone Tempered Newtown Cordmarked -15Po303/1, 15Po303/3, 15Po303/21, 15Po303/22, 15Po303/273; f-g) Sandstone Tempered Newtown Cordmarked - 15Po303/8, 15Po303/24; h) Limestone and Shell Tempered Jessamine Plain - 15Po303/5; i-j) Limestone Tempered Chimney Top Cordmarked - 15Po303/9, 15Po303/7&18; k) Sandstone Tempered Chimney Top Cordmarked - 15Po303/14.

Chimney Top Cordmarked, Chimney Top Plain: 81 specimens (61 body sherds, 8 neck sherds, 8 rim sherds, and 4 basal sherds). Figure 7.

Temper: Limestone temper is the most prevalent tempering agent (n=66; 81.5 percent), followed by sandstone (n=14; 17.3 percent) and quartz (n=1; 1.2 percent). All temper particles are angular to subangular and can vary in size from .25 mm to over 1 mm. Temper is well distributed within the paste. Leaching did occur on some examples with larger limestone temper.

Paste: The paste ranges from fairly clean to sandy. Naturally occurring inclusions are present in about one-third of the sample. The most common inclusions are hematite/manganese particles; however minor inclusions can be chert, sandstone, or quartz particles.

Exterior Surface Treatment: Cordmarking is the most prevalent surface treatment, accounting for over 97 percent (n=79) of the sherds. Smoothed over cordmarked (n=1) or plain (n=2) exteriors are rare. Cordmarking varies. It can be thin, fine cords, or large thick cords. Crossing cords are common. S-twist and Z-twist are present in roughly equal numbers (S-twist - 55.8 percent; Z-twist - 44.2 percent).

Interior Surface Treatment: All interiors are plain matte. Most (73 percent) are smoothed. Well-smoothed interiors occur on 21 percent of the specimens. A few are eroded or poorly smoothed (6.2 percent). Paddle marks are rare.

Color: Sherds tend to be medium to light tan in color on both exteriors and interiors. Some specimens exhibit smudging on the exterior only.

Decoration: Decoration occurs on the lip and/or below the lip on thickened rimstrip/rimfolds (n=5). One of the most distinguishing characteristics of this series are the oblique cord-wrapped dowel impressions on thickened rim strip/rimfolds. The cordage wrapping the dowel is Z-twist. Dowel impressions are 10.13 mm wide and approximately 3 mm deep. Dowel impressions are made by a single dowel and are spaced between 10 and 14 mm apart. Cords are approximately 2.5 mm wide. Other decoration takes the form of S-twist or Z-twist cordmarking on lips. This technique can occur in conjunction with dowel-impressed rimstrip/rimfolds.

Wall Thickness: Thick vessel walls distinguish this series. Body sherd thickness ranges from 8.03-9.98 mm, with a mean of 8.70 mm and a median of 8.60 mm (note that only body sherds with a wall thickness of greater than 8.0 mm were assigned to this series, which accounts for the series' range and mean). Sandstone tempered examples tend to be somewhat thinner (with a mean of 8.58 mm) than the limestone tempered examples.

Rim: Rims are mainly direct (n=4), however, slightly incurvate examples (n=2) do occur. All rims thin towards the lip. Rim thickness for specimens lacking rimstrip/rimfolds ranged from 5.83 to 8.30 mm, with a mean of 7.05 mm and a median of 6.69 mm. Lips are flat to flat-rounded. Lip thickness ranged from 6.12 to 9.16 mm, with a mean of 7.59 mm and a median of 7.63 mm.

Wedge-shaped thickened rimstrip/rimfolds are present on three specimens. Rimstrip/rimfolds were folded over as opposed to being attached separately to the lip. Thickness ranges from 7.69 to 10.71 mm, with a mean of 10.40 mm and a median of 9.77 mm. Rimstrip/rimfold thickness does not vary more than 0.5 mm on any given specimen. Three rimstrip/rimfolds were 26.50 mm wide. One was 8.21 mm wide. The three wider rimstrip/rimfolds were 10.40 mm thick, while the remaining one was 7.69 mm thick. Rimstrip/rimfolds can appear scalloped along the bottom.

Neck: Neck thickness ranges from 8.30-9.83 mm, with a mean of 8.83 mm and a median of 8.67 mm.

Shoulder: None observed.

Base: Bases appear to be somewhat rounded. Basal thickness ranges from 10.23-12.71 mm, with a mean of 11.39 mm and a median of 11.05 mm.

Vessel Form: No rim sherds were large enough to definitively describe vessel form; however, jars appear to be the represented form. Orifice diameter could be determined for five rims. It ranged from 14-22 cm.

Appendages: None observed.

Comments: This is a newly defined provisional terminal Late Woodland ceramic series for eastern Kentucky. It is distinguished by thick vessel walls and cord-wrapped dowel-impressed rims with thickened rimstrip/rimfolds. Based on a single acceptable radiocarbon date from Lost Image Rockshelter, the type site for the series, Chimney Top ceramics were manufactured during the terminal Late Woodland period (around A.D. 900).

Ceramics assigned to this series are most closely similar to the terminal Late Woodland Woods Series (O'Malley 1990) and Parkline Series (Kerr 1990) defined at sites in western West Virginia. They also may be similar to ceramics found within Jack's Reef Horizon/Intrusive Mound Complex sites documented in Ohio, western Pennsylvania, and West Virginia. Though assigned based on an arbitrary 8 mm thickness, the average body sherd thickness for the Chimney Top Series (8.70 mm) is greater than that of the Woods Series (7.50 mm). In comparison to the Parkline Series, incurvate rims are a minority in the Chimney Top Series and average body thickness is greater (almost 9 mm for Chimney Top versus about 7 mm for Parkline). The Chimney Top Series does not resemble in any way the Peters Cordmarked specimens recovered from the terminal Late Woodland component at the Grayson site in Carter County, Kentucky (Ledbetter et al. 1991:127-128).

Three sites located within 5km of Lost Image Rockshelter – Site 15Mf147, Clay Doll Shelter (15Po60), and Worth Creech Shelter (15Wo2) – have produced Chimney Top Series ceramics (see Appendix A). They help define the series' provisional geographic range: the Red River Gorge region of eastern Kentucky.

JESSAMINE CERAMIC SERIES

Jessamine Plain, Jessamine Cordmarked: 8 specimens (6 body sherds, 2 rim sherds). Figure 10.

Temper: All specimens are limestone and shell tempered. Limestone temper particles are angular to subangular and can vary in size from .25 mm to over 1 mm. Very little leaching was noted for the limestone temper particles. The presence of shell is indicated by small platy holes left where the shell has leached out. The holes indicate that the shell was about 1 mm in size. Temper is well distributed within the paste

Paste: The paste is fairly clean. Naturally occurring inclusions are present in about half of the sample. The most common inclusions are hematite/manganese concretions; however, quartz particles also can be present.

Exterior Surface Treatment: Most specimens (n=7; 87.5 percent) are plain. Twist could not be determined for the single cordmarked specimen.

Interior Surface Treatment: All interiors are plain matte. The interior surface treatment was smoothed on seven specimens and well-smoothed on the remaining specimen.

Color: Sherds tend to be light brown to tan in color on both the exterior and interior.

Decoration: Decoration was present only on rims. This consisted of shallow, narrow, trailed lines in the form of a "V."

Wall Thickness: Body sherd thickness ranges from 7.70-9.92 mm, with a mean and median of 9.14 mm.

Rim: Rims are direct. Rims thickened towards the lip. Lips are flat to flat rounded. Rim thickness ranges from 7.50 to 7.63 mm. Lip thickness was 8.50 mm and 9.91 mm.

Neck: None observed.

Shoulder: None observed.

Base: None observed.

Vessel Form: No sherds were large enough to definitively describe vessel shape, however all appear to be jars. Orifice diameter was 12 cm for both rims.

Appendages: None observed.

Comments: Jessamine Series ceramics, the hallmark ceramic series of the early to middle Fort Ancient period (A.D. 1000-1400; Henderson 1998:134) in central Kentucky, was first defined at the Muir site (Turnbow and Sharp 1988). It was later revised by Sharp and Pollack (1992) from their work at the Florence Site Complex.

Mixed limestone and shell tempered ceramics have been recovered from sites within the Red River Gorge area (Henderson 2008:739-902), however most were recovered prior to the

definition of the Jessamine Series. These site assemblages likely represent an extension of the geographic range for Jessamine Series ceramics into eastern Kentucky.

THE FISHERMEN OF THE FALLS OF THE OHIO: THE RELEVANCE OF FISHING IN LATE MIDDLE ARCHAIC SETTLEMENT DYNAMICS

by:
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HMB Professional Engineers, LLC

ABSTRACT

The terminology of hunting and gathering generally implies, but indirectly calls out, the inclusion of fishing in the subsistence regime. With a lack of preservation of fish remains and artifacts, it is easy to overlook the role of fishing in space and time. Fishing was undoubtedly practiced at some level by mobile groups throughout time and in suitable locations; however, it facilitated the development of a more sedentary lifestyle. Several factors are important in assessing the importance of fishing, among which are certainly location and preservation. Drawing from data for the Old Clarksville, Hornung, and KYANG sites, this paper examines documentation of fish populations at the Falls; the bony remains of fish from well preserved sites; the various technologies used to procure fish during different seasons; use wear studies on specific artifacts manufactured from fish remains; and features that may reflect the capture and processing of fish. All this data provides the basis for asserting that fishing at the Falls was a critical component of the overall subsistence base that allowed for increasing sedentary and year-round residence. Poor preservation and the lack of recognition of fishing-related technologies and features too often eclipses the importance of this practice during Middle Archaic times. The labor required to develop and maintain a fishing industry is yet another example of the growing investment in specific places on the landscape during this period.

INTRODUCTION

The term “hunters and gathers” implies but does not specifically call out the activity of fishing. This is with good reason as it is difficult to assess the importance of fishing in an economy of a culture when often there is so little surviving evidence to evaluate. Lutins (1992) and others point out the lack of studies on the subject which limits our understanding of the importance of fishing in precontact Native American settlement systems and economies. The paucity of evidence for fishing is due to several factors. First, preservation can be a key constraint, often due to the fragility and small size of fish bones. Archaeological technology is not typically

sufficient to recover the very small remains (Rogers 2008). The technological raw materials used to capture fish include bone and antler fishhooks, wooden or cane spear shafts and traps, fiber used in nets and baskets, and stone for net sinkers. Most of these raw materials are subjected to rapid decay especially in wet environments such as along rivers and streams making it difficult to assess the extent at which they were being used. Other features used to capture fish, such as stone fish weirs, are not often recognized as purposefully constructed features. Studies of practices among living populations also suggest that the practices associated with the processing of fish do not often leave a detectable footprint in the archaeological record.

The Falls of the Ohio River region was a prime location for fishing during Native American precontact times and conditions were also well suited for bone preservation. This paper presents the evidence for intensive fishing at the Falls of the Ohio River during the late Middle-early Late Archaic time frame (ca. 4300-3400 BCE). The surviving evidence includes the bones of the fish themselves, and artifacts made from fish bones. A second line of evidence consists of the artifacts that reflect the various technologies used to capture fish. This is followed by suggesting that some features observed in the area may have been associated with the processing of fish. Finally, the importance of fishing in the overall economy of the late Middle Archaic into the early Late Archaic periods is addressed along with the implications for mobility and settlement during this time.

STUDY AREA

The study area is focused on the vicinity of the Falls of the Ohio River. The Falls area is within an approximately 35-kilometer radius of the Falls of the Ohio River and includes both north-central Kentucky and southern Indiana. It is characterized as a low-lying peneplain known as the Scottsburg Lowland and the surrounding ridges with entrenched valleys that carry streams into the lowlands before emptying into the Ohio River. The Falls of the Ohio River was not actually a single vertical drop, but was instead a series of low, cascading rapids that extended over four kilometers, dropping more than eight meters (Bader et al. 2021:2-3). The rapids were formed as a result of the river flowing over Devonian-period hard, limestone shelves. In this broad portion of the river valley, the only stretch of bedrock is to be seen that extends entirely across the channel (Mallott 1922:91). The floodplain was open and broad at the Falls, sometimes exceeding two miles in width. During the drier seasons of the year, the water was low, and in historical times, virtually impassable by large boats. In the highwater months of the winter and early spring, flooding was frequent, and the waters of the Falls were dangerous to travel. The Falls was a natural and logistical landmark, allowing easy crossing of the river in low water, and a transportation route up and down the river by trained boatsmen when the water was high.

Evidence for Native American fishing at the Falls derives from the Old Clarksville site (12CL1), situated on the Ohio River at the Falls themselves, the Hornung site (15JF60) located some 35 kilometers below the Falls at the confluence of the Salt River and Ohio River, and the Lone-Hill KYANG complex (15JF10/15JF267) which lay some eight miles due south of the Falls on an extinct 20,000-acre interior lake (Figure 1). The Buffalo Run site (15BU463), situated further

south on the Salt River, is also relevant to this discussion. The recovery of numerous artifacts associated with fishing, a rich and broad array of fish species, and the strategic locations of these sites at the junctures of the Ohio River and tributaries all provide credence to the establishment and growth of Native American fishing villages during the late Middle and early Late Archaic periods in this area.

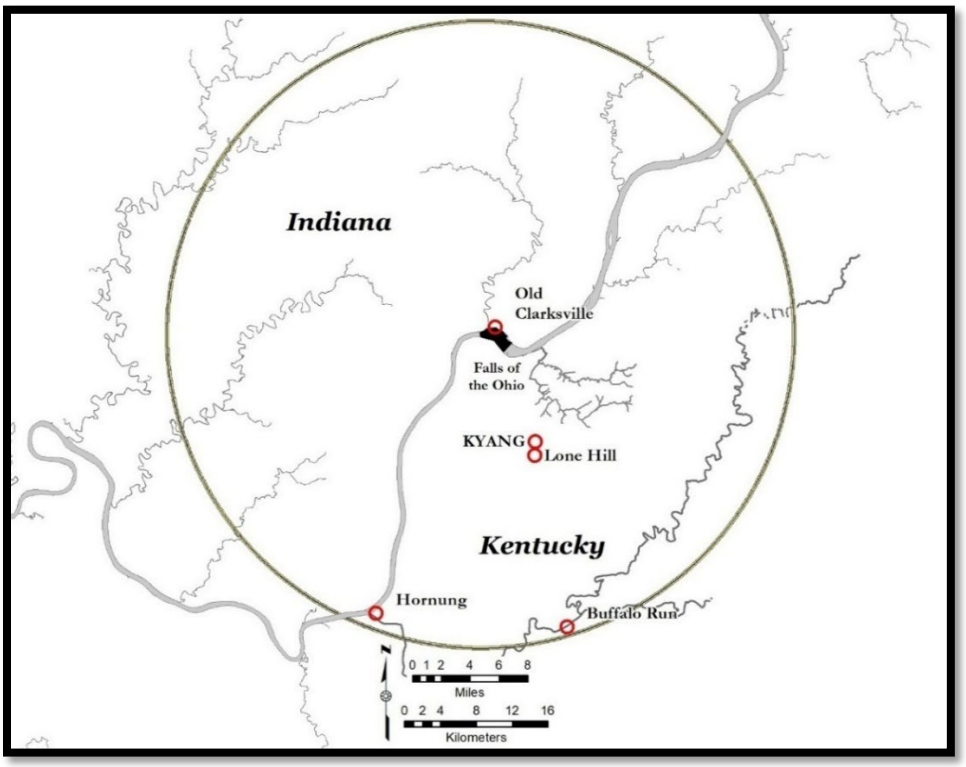

Figure 1. Study area and principal sites.

BACKGROUND

Numerous historic accounts by early explorers and settlers speak to the richness of the environment at the Falls especially noting the diversity and abundance of fish. It is said that over 100 species were once present in the Ohio River, and that some could reach very high sizes in terms of length and weight. Filson had this to say in his writings of 1784:

> The fish common to the waters of the Ohio are the buffalo-fish, of a large size, and the catfish sometimes exceeding one hundred weight. Salmons have been taken in Kentucky weighing thirty weight. The mullet, perch, garfish, and eel are here in plenty. Suckers, sun0fish, and other hook-fish are here abundant, but no shad or herrings. We may suppose with a degree of certainty. That there are large subterraneous aqueducts stored with fish, from whence fine springs arise in many parts producing fine fishhook in variety (Filson 1975: 25-26).

Aside from the main channels, pools, and backwaters of the Ohio River, there was the unique environment associated with the Falls themselves, which, depending on the season of the year, was characterized by shallow pools on the Devonian fossil beds often exposed in low water. Further, there was a very large lake named Oldham's Pond (later Ash Pond) estimated to cover 20,000 acres that occupied much of the central portion in what is now Jefferson County south of the Falls (Figure 2). This lake was marshy and shallow in the warmer months of the year, but more expansive and deeper in the wet seasons. It was fed by Fern Creek and numerous springs. The water accumulated there, unable to penetrate into the ground which was underlain by impervious Devonian shale. Early maps name a series of these springs as the "Fish Ponds" or more recently, the Fish Pools (Figure 3 and 4). The springs of Fishpool Creek are now long gone having been filled and developed with modern infrastructure. Until only recently, the large twin springs, called the Duck Ponds, were still flowing at the base of the landform on which lies the KYANG site (15JF267).

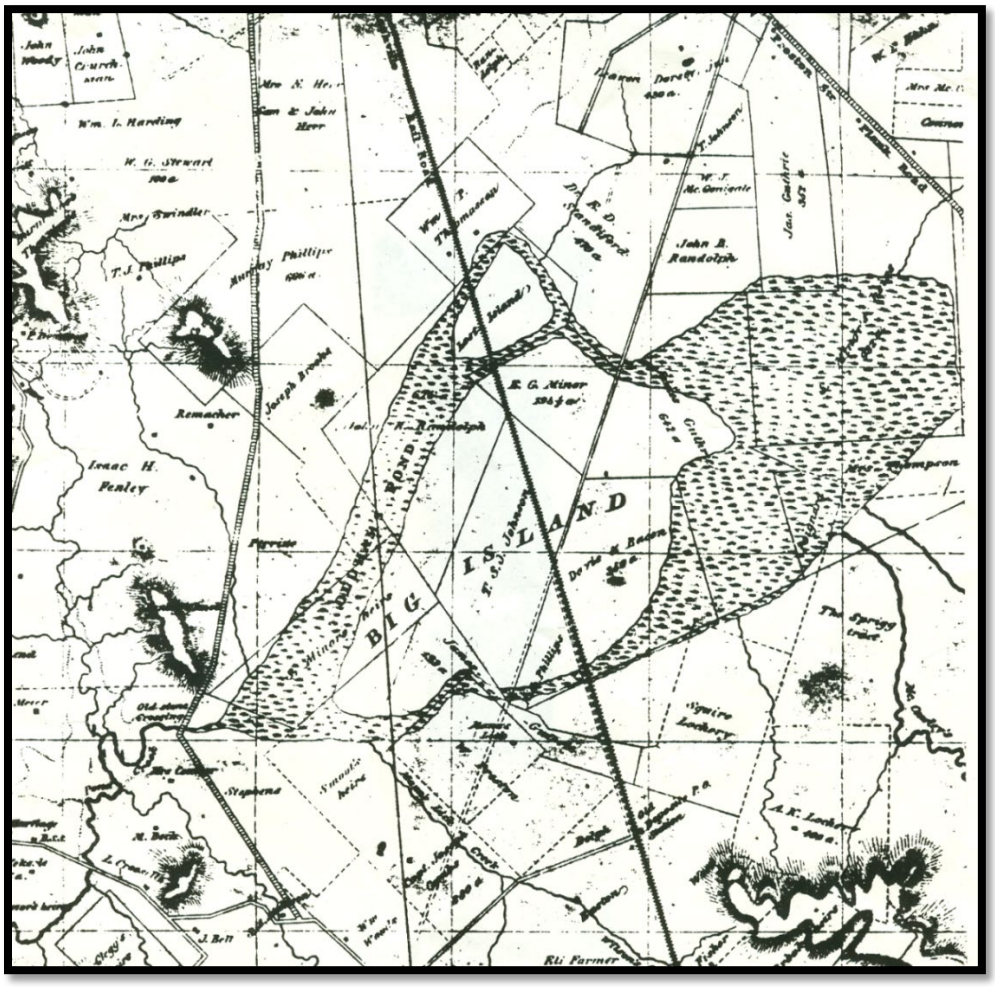

Figure 2. 1858 G.T. Bergmann map of southern Jefferson County showing historic spring-fed lake known as Oldham's Pond (later Ash Pond) south of the Falls of the Ohio.

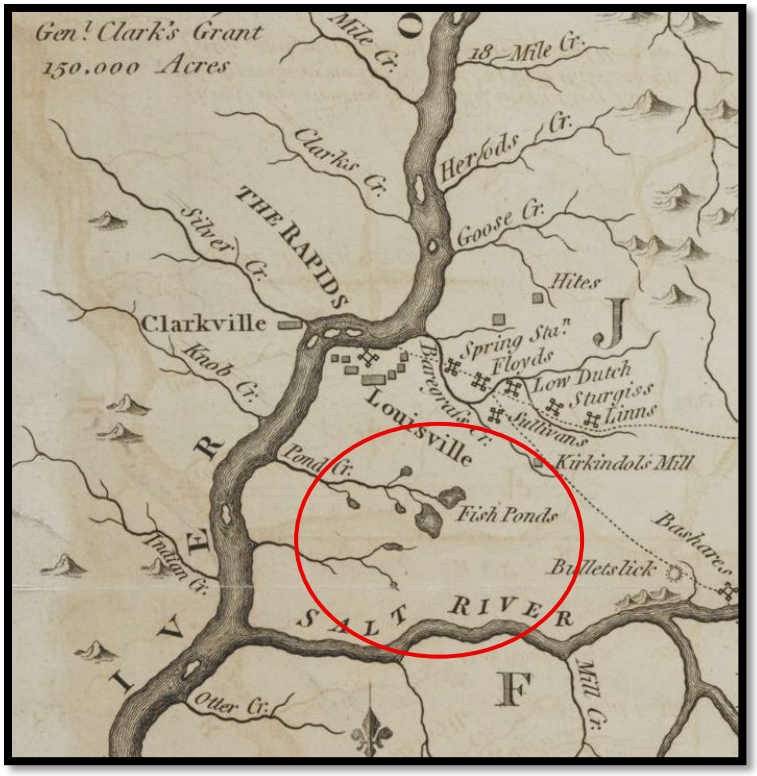

Figure 3. Filson's 1784 map of Kentucky showing the Fish Pools on Pond Creek south of the Falls (The Discovery, Settlement and Present State of Kentucky by John Filson. Reprinted in 1975 with an introduction by William H. Masterson. Peter Smith, Gloucester, Massachusetts.

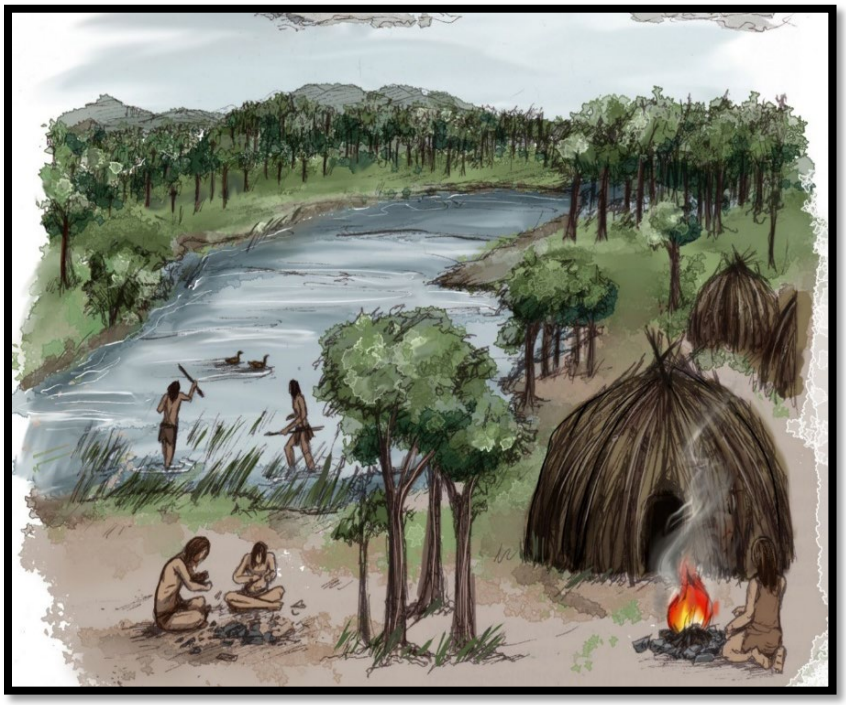

Figure 4. Visualization of Archaic lakeside occupation drafted by Leigh Stein (Janzen 2008:67).

Despite the diversity of fish documented at the Falls, fish remains from late Middle Archaic sites would seem to indicate a preference was utilized for the drumfish. Don Janzen goes so far as to say that drumfish were the only species utilized in Archaic times at the Falls sites such as old Clarksville (Janzen 2008:42), but this seems unlikely. Bones of the buffalo fish and catfish have been found in low frequencies, and it may well be that the remains of other fish were not preserved. Drumfish do appear to have been favored even over catfish which has twice the caloric value. The drumfish is a bottom feeder which occupies a variety of habitats; however, they prefer shallow water. Today's fishermen refer to the drumfish as a trash fish. Personal communication with current-day fishermen, on-line fishing sites, and other published materials claim that the taste of drumfish varies by location and the method of cooking. One source (Keich:2015) source claims that the taste of freshwater drum from the Ohio River is much tastier than that of Great Lakes, for instance.

The remains of drumfish are frequent finds among shell-bearing sites and for good reason. Drumfish and mussels have a symbiotic relationship. The drumfish feed upon the young mussels and other mollusks such as snails and crayfish. Mussel populations benefit as their eggs are transported up and down the river in the mouths of the drumfish, thereby creating new mussel beds. It is probable as well that the calcium in the mussel shells may enhance the preservation of the drumfish bones. It is no coincidence that drumfish remains are abundant at shell bearing sites such as Indian Knoll. The preference of drumfish at Indian Knoll, as an example, can be seen from counts of bones from the midden where 305 drumfish bones were found in comparison to only six other fish bones (buffalo; Webb 1974:379).

FISH REMAINS AND ARTIFACTS

The very small size of the bones of some fish contributes to a lack of detection during archaeological recovery. At the Falls, three types of bone are most commonly found in archaeological contexts, namely, the pharyngeal arches, dorsal spines, and otoliths. The preservation of these bones may be due to the fact they are thick and dense. The pharyngeal arches are the embryonic structures that develop into the gills and jaws of the fish (Figure 5). These bones contain numerous calcified molariform "teeth" which are necessary to grind the shells of the small mollusks they feed upon. While the pharyngeal arches are common finds, they do not appear to have been utilized by the Native inhabitants. Most commonly, the teeth themselves have been lost.

Figure 5. Drumfish pharyngeal arches with teeth.

The dorsal spines (Figure 6) are often picked up by collectors and thought to be artifacts. Professionals and collectors alike attribute a function to them of piercing materials or as needles. While studies of over 100 dorsal spines from KYANG, Clarksville, and Newcomb sites show that some may have been used in this manner, the percentage of use wear on the tips of these spines is low at 11 percent or less. Some of the shafts are broken, which could have been brought about by use. Virtually no striations or other signs of use are present on the shafts (Bader 1992). Interestingly, the shafts of these bones often exhibit shaving or sanding perhaps to smooth the sharp edges. Chattermarks, caused by the shaving of bone with a flint flake or scraper, are seen on some of the bones examined (Bader 1992). One can only speculate that the bones were scraped to smooth or shape them. Further, polishing is evident on 25% of the spines. More revealing however, is the modification done to the natural foramen at the proximal end of the spine. In 28% of the cases, the hole appears to have been enlarged (Bader 1992). This suggests these objects may have been used more for ornamentation such as a pendant or necklace. A few cases suggest that the spines were burnished or colored, a further indication that these may have been used for ornamentation (Figure 7).

Figure 6. Dorsal spines of the drumfish.

Figure 7. Burnished and stained dorsal spines.

The third most common drumfish bone is the otolith (Figure 8). Otoliths are part of a fish's inner ear, helping with balance and hearing. Otoliths grow throughout the life of the fish. Several studies done in the 1970s show a correlation between the length of the otolith and the length

and weight of the fish. In 1969, Don Janzen did a study using 809 left otoliths. The otoliths were documented from 12-3-inch excavation levels of five 5-x-5-foot square test units at the Old Clarksville site (12CL1) at the Falls. The results showed that an average drumfish was 14.7 inches in length and weighed 12.3 pounds. The largest otolith documented was from a fish that was nearly 3 feet in length and weighed 27 pounds. In all, the 809 drumfish bones from the Old Clarksville site (12CL1) reflect 1,660 pounds of meat if an average of the weights is calculated (Janzen 2008:42; 1969). At Old Clarksville, the range of length varied from 19.3 to 34.6 inches in length, and the weight of the fish from 3.9 to 27 pounds (Figure 9). This revealed that the largest fish in the group measured 23.7 inches long and 9 pounds. In recent times, fish of this type have been known to weigh more than 54 pounds. In comparison, Janzen recovered evidence from the same excavated test units for 111 whitetail deer. While Janzen (2008:41) estimated that the 111-whitetail deer would have provided 13,875 pounds of meat, 5328-5550 pounds may be a more accurate calculation as modern-day hunters claim that a 100-pound adult deer supplies 48-50 pounds of meat rather than 125 pounds. as suggested by Janzen. That being said, of the two sources of meat, fish would represent 30 percent of the dietary protein, while deer would reflect 70 percent.

Figure 8. Obverse and reverse views of a modern drumfish otolith.

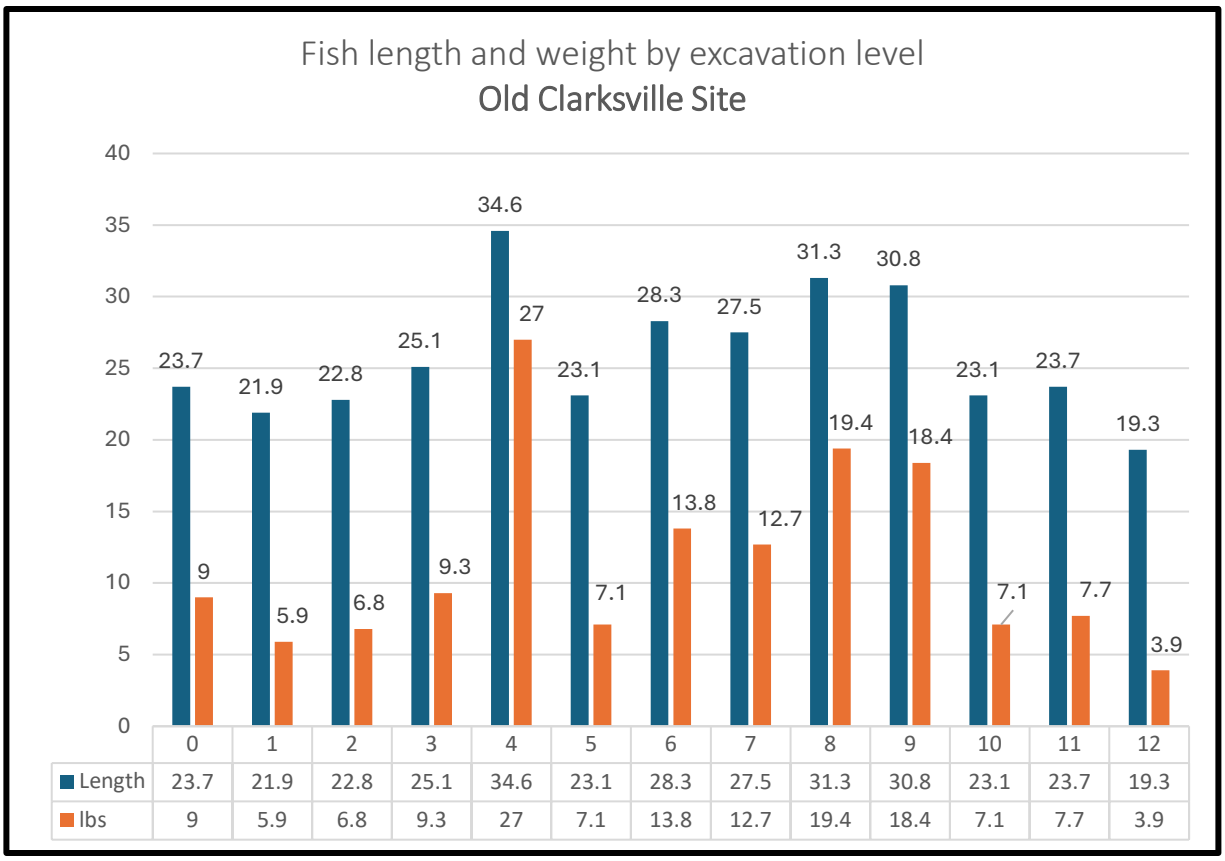

Figure 9. Otolith length and calculated fish weight from the Old Clarksville site (12CL1). The coordinates 0/0 reflect recent data.

STRATEGIES

There is evidence for multiple strategies for capturing fish at the Falls, and some indications that these methods may have varied by season (Figure 10). These include line and sinker, spear fishing, and possibly fish weirs. The use of nets and baskets at the Falls does not appear to have been widely used; Janzen thought it unlikely, but this conclusion may well reflect negative evidence. Certainly, many bone implements suitable for netting and basket making have been recovered.

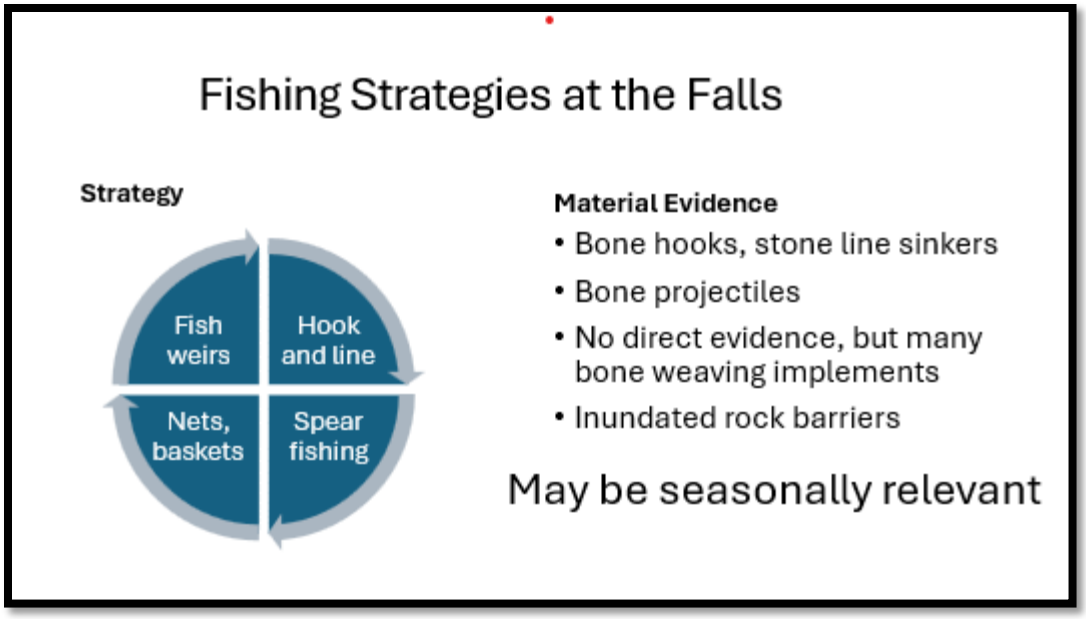

Figure 10. Precontact fishing strategies.

The many fishhooks recovered are the strongest evidence for the importance of fishing. As noted by Janzen, there were multiple techniques for manufacturing fishhooks. It appears that any suitable piece of bone, regardless of which element it was, was used. Longbone blanks from large and small mammals, unmodified deer ulna, phalanges from larger mammals, and virtually any suitable thick flat piece of bone appeared suitable. The curved hollow longbones of birds were also used to manufacture hooks.

The range in sizes of fishhooks is great, with some being small enough to slip through the standard sifting screen (Figure 11). The largest were often made from a prepared flat blank from the long bone of a deer; these blanks have been found at the Falls (Figure 12). This technique resulted in the creation of large, thick hooks which were grooved at the proximal end to attach a line. It has been said by those doing experimental work that even though these were heavy hooks, they were not strong enough to capture large fish, and the collection of roughly 50 large hooks from Old Clarksville contains numerous broken examples (Figure 13). It is hypothesized that perhaps these may have been used to slowly pull the fish into shallow waters close to the bank where they could then be grabbed or speared. Examples of residue from hook manufacture suggest that creating a squared blank was not always an important step in manufacture (Figure 14).

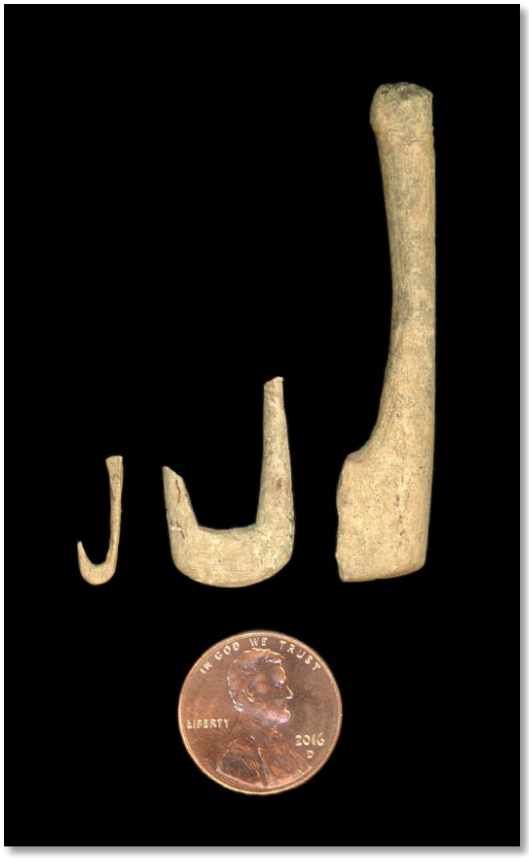

Figure 11. Range in sizes of fishhooks from the Falls area.

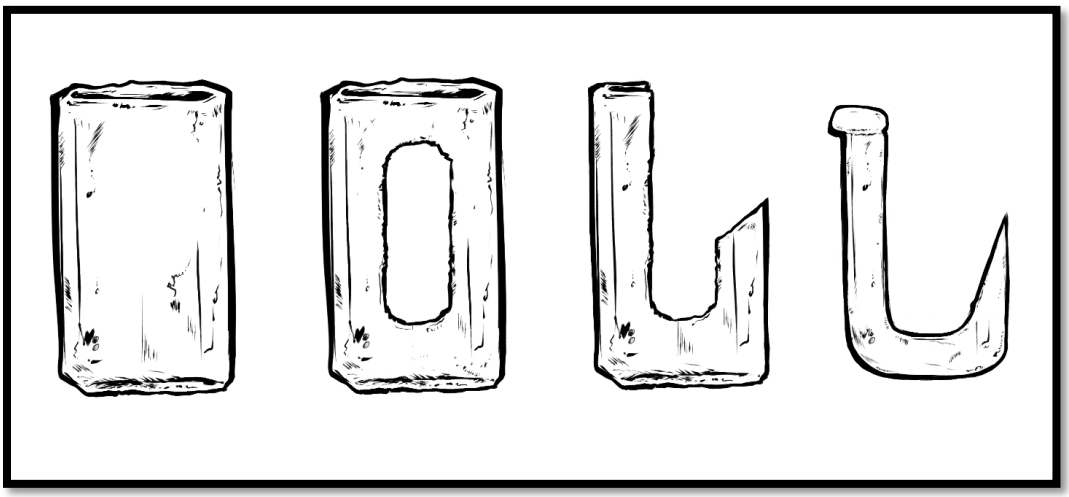

Figure 12. Drawn from imagery by Janzen (2008:52) showing steps of fishhook manufacture from a deer long bone blank.

Figure 13. Large thick hooks from the Hornung site, broken.

Figure 14. Residue from fishhook manufacture using mammal longbones.

Smaller hooks were made from small mammal bone or even bird bone (Figure 15). The bird bone hooks are especially small, and as mentioned above, could easily be missed during screening. These are generally not flat but retain the natural curvature of the shaft. While the bird bone hooks are very small and thin, the curvature of the bird bone may have served to provide additional robustness over that of larger mammals (Bader 1992:139).

Figure 15. Various sizes of fishhooks from the Hornung Site (15JF60).

Fishhooks were also made from the phalange of the deer (Figure 16). These bones were grooved and split in half. Taking advantage of the natural morphology of the bone, the fishhook was carved (Figure 17). Numerous examples of residue from this method have been found at the Falls sites.

Figure 16. Detritus of fishhook manufacture from deer phalanges.

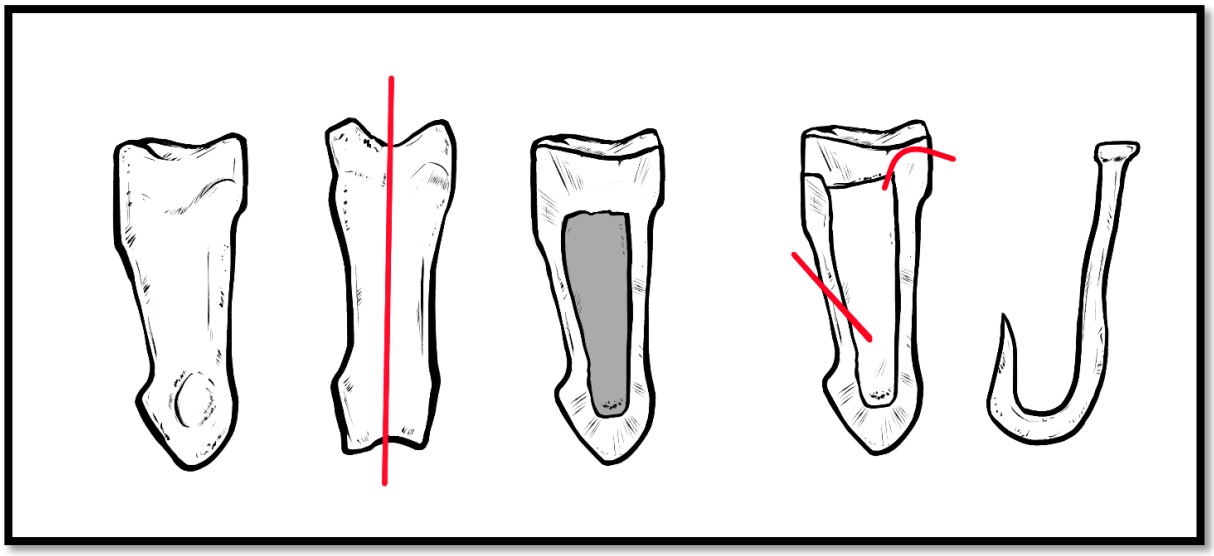

Figure 17. Stages of fishhook manufacture from deer phalanges (adapted from Yost 2016).

Since drumfish were bottom feeders, and because the Ohio River was generally shallow for most of the year, it is speculated by Janzen (2008) that nets were not used to capture this species of fish. Rather, the small, grooved stone objects typically referred to as net sinkers should perhaps be more appropriately called line sinkers (Figure 18). These were designed to lower the hook to the bottom to capture the fish. Only about a dozen of these are in the legacy collections for the Falls, though others are in private collections.

Figure 18. Possible line sinkers from the Old Clarksville Site (12CL1).

Another method of capturing fish was by spearing, especially in shallower water. Rostlund (1952:175) provides a series of historical references that detail fishing as using spears or darts in the Southeast by Indigenous groups. In these accounts, the spears were armed with "fixed" points, some with barbs. That is, they were not equipped with a detachable head and attached line for retrieval. Sharpened and fore-hardened cane are often mentioned in the accounts for the tribes of the Interior Southeast, specifically, Georgia and Alabama. Anecdotal stories from the early European settlement in the vicinity of the Wet Woods (a popular name for the swampy area surrounding the ancient lake) speak to the abundance of fish in the shallow waters and the ease at which they could be caught by spearing with pitchforks (Hardaway 1941). When the water in the lake reached a certain height, it spilled over southwesterly via Pond Creek to the Ohio River. When the overflow met the backwaters of the Ohio, it is said that thousands of fish-catfish, carp, buffalo, and more would move upstream into the swampy lake where they were trapped when

the waters receded. In these historic accounts, the lake is reported to have been an excellent breeding ground for fish.

During an analysis of bone artifacts from KYANG, a series of pointed bone artifacts were examined that could be bone spear points. While these could easily be mistaken for awls, especially splinter awls, there were distinct differences. The splinter awls often show a flattened cross section at the tip, with a very sharp point. The lateral edges are rough and unmodified. In contrast, the possible spear points show a more rounded tip, and the lateral edges are round and smoothed along the entire length. More importantly, they exhibit shallow bilateral notches. Under magnification, manufacturing striations suggest that the creation of these notches was deliberate. Initially, the function of these tools was interpreted to be bone projectiles. Notches bone projectiles were found at Indian Knoll in the Green River area (Webb 1974:293). However, they could just as well have been hafted and used in spear fishing. Each of the examples examined were broken at or below the notch (Figure 19 and Figure 20). Webb notes that the examples from Indian Knoll were also found shattered (Webb 1974:294). The Indian Knoll examples also show annular scratches, which Webb interprets as associated with the base being inserted and secured into a socket (Webb 1974:294). The possibility that they were gorges was also entertained, such as are seen in Green River assemblages (Webb 1974:291, 299). Gorges are bipoint sharp bone implements that were tied at the center of the fishing line and became entrapped in the fish as it attempted to swallow it. However, the artifacts from the Falls sites are not bipointed, are too long, and have what appears to be a distinctive cross-section from gorges.

Figure 19. Broken notched bone implements, possible spear points used for fishing.

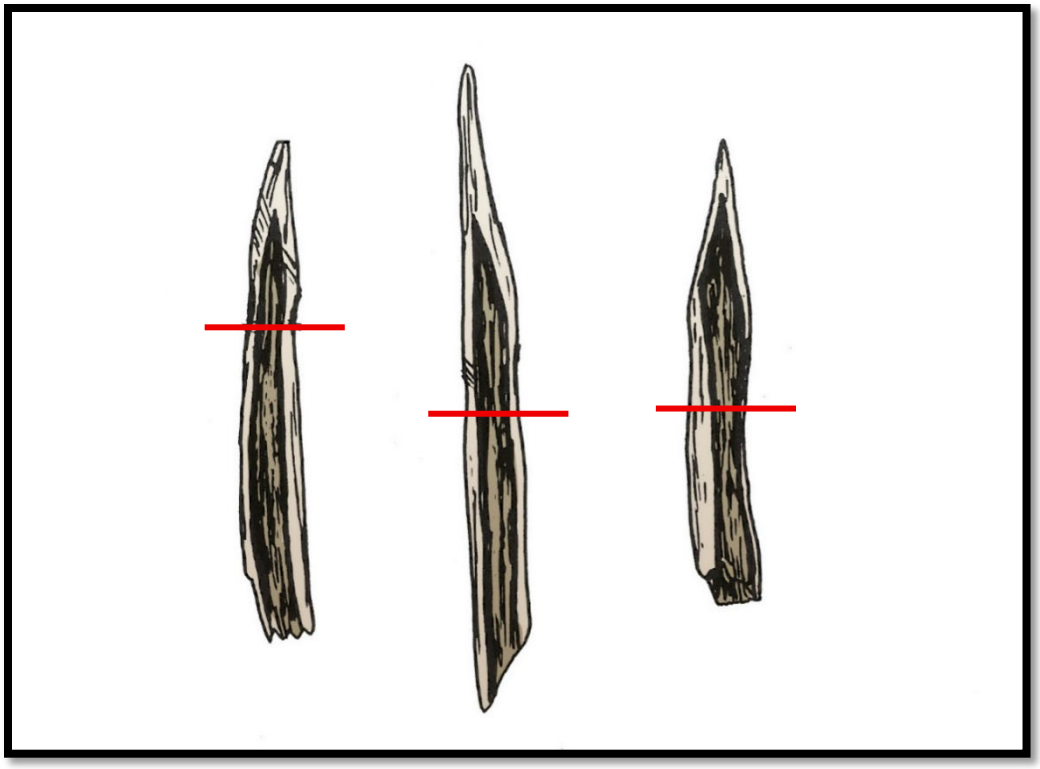

Figure 20. Drawing of pointed bone points from the KYANG Site showing manufacturing marks at notch (Bader 1992).

Lastly, one other technology worthy of mention is fish weirs. Fish weirs in various forms have been identified throughout North America. Fish weirs were made of stone, wood, or even brush, or a combination of these. Cane weirs are mentioned by Rostlund (1952:170). Weirs were used to force fish into a situation that would facilitate their capture. Weirs were one of the most efficient means of capturing a high return of fish in relation to the amount of energy expended (Dodson 2021). They were often constructed in shallow portions of rivers bounded to either side by relatively flat terraces. Once the fish were trapped by weirs in shallow water, they could be easily captured with basket traps, nets, spears, or even by hand. Numerous historical sources provide information on the plant fibers used for cordage for baskets and netting. Rostlund provides a list of published references on the distribution and types of indigenous fish nets by tribe and region (Rostlund 1952:162-167) and specifically calls out historical references to the types of plant fibers used in netting and fish nets by species (Rostlund 1952:168). The material used in netting was largely determined by the plants which were available in a particular location. As reported by Rostlund (1952:168), the fiber of Indian hemp, milkweed, nettle, willow, and basswood may all have been used to make fishnets in the interior southeast.

There are some ethnographic references to fish weirs (see Rostlund 1952:169), but in general, there is a lack of historical or ethnographic information for most areas, especially in the Interior Southeast. Likewise, until recently, there have been little studies dedicated to archaeologically identifying and researching fish weirs (but see Lutins 1992). Twenty-three weirs have been recorded in Tennessee (Dodson 2021), but only one is mentioned in the gray literature

for Kentucky. This “fish trap” was recorded by Webb and Funkhouser (1932:36) in Boyle County. There is difficulty in identifying fish weirs in current conditions, often due to the channelization and impoundment of rivers and streams. When found, there are other problems in assigning the construction and use of the weirs to a temporal period; they are rarely associated with artifacts. Capturing fish with a weir does not require hooks or sinkers (Lutins 1992), and the cordage or organic materials used to make the weir do not typically survive.

Considering the large numbers of fishing related artifacts at several Falls sites, early historic maps of the Falls of Ohio area were examined. Maps from 1793 (Figure 21 and Figure 22) and 1796 (Figure 23) show a broken line of rocks across the base of a channel of the Ohio River near the Indiana shore at the location of the Old Clarksville site. Some (i.e., Donald Janzen) have interpreted this as the remains of a Native American fish weir. Similar lines of rock appear in later maps just at the base or even at the crests of the rapids. While confirmation that this line of rock was a weir cannot be made, especially as it is now inundated by the McAlpine Locks and Dam pool, the presence of abundant fishing implements and fish bones at the securely dated Old Clarksville site strengthens the case for a weir

As weirs were especially efficient during spawning when large amounts of fish were present, such as during the spawning season, and since drumfish appear to have been a highly exploited species at the Falls during the Archaic period, the spawning period for this fish was reviewed. The freshwater drum spawns in the Falls region in shallow water in late spring into early summer (April through June); and lasts for about 6-7 weeks. The fish congregate in large groups within slow-moving pools next to fast moving water….an apt description of the Falls in low water. The young fish arrive first and adults move into shallower water to spawn, such as in tributaries. In the summer, the drum may move to deeper slower moving waters, such as the large interior lake south of the Falls. In the fall, they migrate up tributaries, at which time musseling would have become more important. This information provides potentially valuable information for establishing the seasonal cycle of activities in the area.

In summary, the use of fish weirs in Archaic Native societies has not been well considered in reconstructions of subsistence and settlement patterns. Weirs are seldom recognized, even when present. Aside from the stone portions of weirs, preservation of weirs is largely non-existent. Fish weirs can be hard to date, as they were likely used for decades or even centuries. They could have been dismantled and reconstructed in the same location (Hirst 2025). Considering the poor preservation of weirs and the difficulty in identifying them, and in the absence of bone and antler fishing tools, which do not often preserve, there is almost certainly an underestimation of the value of fish in the economies of late Middle and early Late Archaic societies in areas such as the Falls.

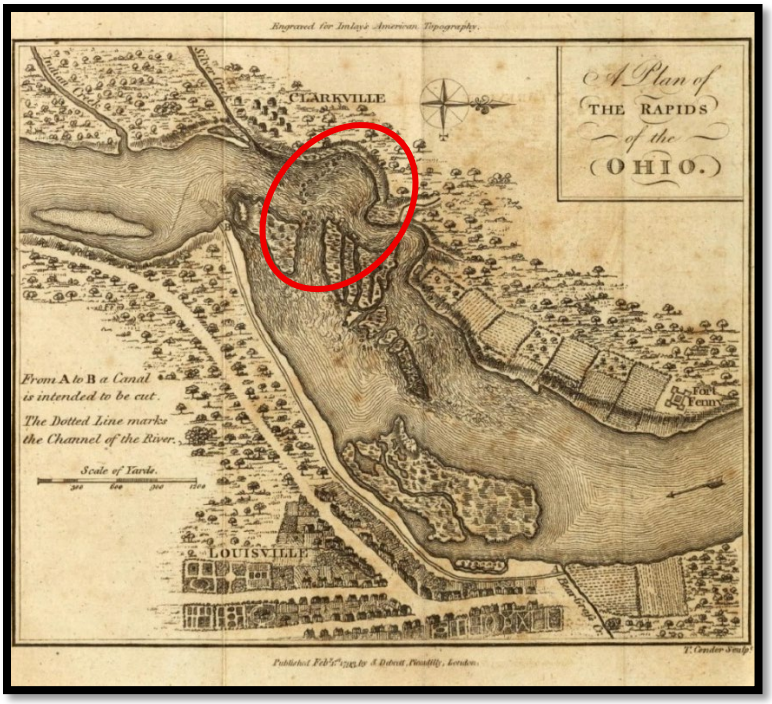

Figure 21. 1793 map of the Falls of the Ohio River, Gilbert Imlay's American Topography, J. DeBrett, Picadilly, London.

Figure 22. Detail of possible fish weir at the Falls of the Ohio (J. DeBrett 1793).

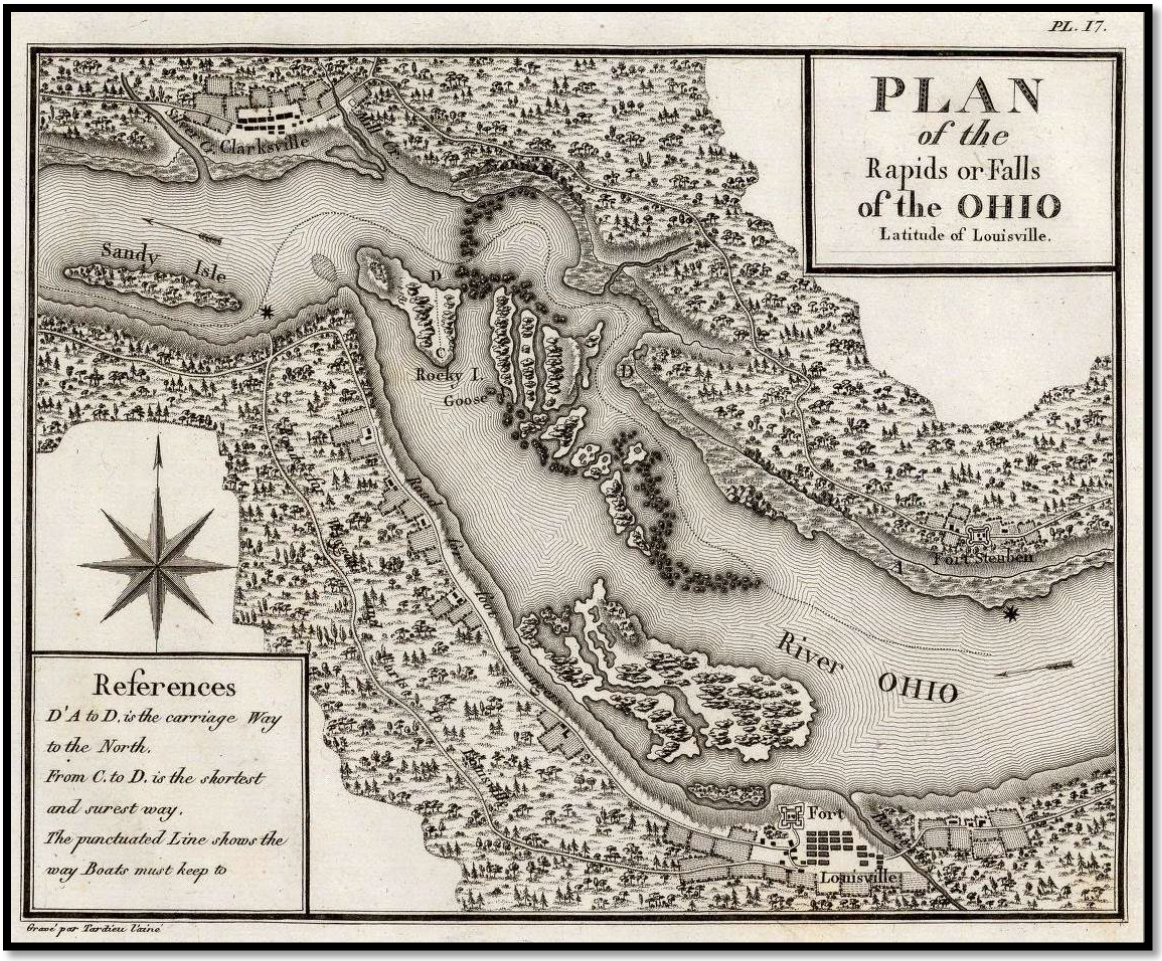

Figure 23. 1796 Plan of the Rapids at the Falls of the Ohio River (Collot 1826).

PROCESSING AND FEATURES

In some societies, the taking of fish was simply not important or was a minor component of subsistence. In other societies, fish may have been captured, but were generally not preserved, for additional fish could always be captured the next day (Rostlund 1952:138). Rostlund notes that the preservation of fish means that it was an important item in the economy (Rostlund 1952:138). He references one source that suggests that coastal groups may have traded preserved fish to interior sources (Swanton 1946:737).

Native American precontact fishing sites are often hard to identify archaeologically (Lutins 1992). It has been speculated that Native peoples captured fish and immediately disposed of the waste (heads, fins, tails) into the river or stream. The waste may also have been left by the waterside and was later consumed by predators. It is also suggested the Native peoples may have burned the remains due to the smell and the fact that it could attract scavengers, especially if near the residential site (Lutins 1992).

While initial fish procurement sites might be hard to identify archaeologically, evidence of the processing or preservation of fish may be possible to find. There are numerous methods for processing fish, depending on the area and climate, it occurred in. The employment of various types of preservation would reduce waste and more effectively utilize the capture (Fiveable 2025).

Rostlund notes that the simplest way was simply to let the fish freeze (Rostlund 1952:137). This was not, however, a method that would have been reliable in the Southeast where temperatures were too moderate. As is true today, drying, smoking, and salting were important methods used for preserving fish. Rostlund (1952:137-139) further states that drying and smoking was the most common method of preserving fish in the Native American Southeast, noting notes that preserving fish by drying is recorded for nearly every tribe that fished, though there are no accounts from the interior southeastern groups. Drying can be done with heat or simply sun-dried. The heat prevents microbial growth. Smoking exposed fish meat through the burning or smoldering of materials; this added flavor as well as preventing bacterial growth (Fiveable 2025). Rostlund describes one method known that was widespread in the Southeast in which a raised wooden platform "grill" supported by corner posts and was used for broiling or "scorching" fish (Rostlund 1952:137). Salting or brining were used to draw out moisture and prevent spoilage (Fiveable 2025). This method is however dependent upon the access to salt, which was very abundant in about a dozen licks south of the Falls area, the two largest and the better-known being Mann's Lick and Bullitt's Lick which saw very successful operations historically (McDowell 2001:782-783). Other methods of utilizing and preserving fish include the pulverization of the meat into a meal and stored dried. Sometimes this meal was mixed with grease or fish oil, and berries may have been added. This method results in a product known as pemmican (Rostlund 1952:140).

Considering the abundant fishing related artifacts at the Archaic Falls sites, it would seem a given that features associated with fishing would have been documented in the various excavations that have occurred since 1970, but few of the records for these sites report any features that appear to have been directly associated with the procurement or processing of fish. The recorded features for the excavated portions at Hornung, Clarksville, and KYANG such as mortuary features, small hearths, and possible storage/refuse pits offered limited tangible data.

One commonality at these sites is the high density of fire-cracked cobbles and burnt limestone (Figure 24). Assumptions are that the fire-cracked rock was used for cooking in hearths, and possibly for heat. The amount of the rock seems disproportionate with the relatively few thermal features that were found at these sites. Further, much of the rock is not found within discrete features but distributed throughout the midden. The features may well have been dispersed at the site, but there appear to be few associated basins which would have originally contained them. It seems reasonable to suggest that these rocks may have been used to process meat (whitetail deer and other mammals) and fish through drying. If so, perhaps the rocks were heated and spread on the ground surface for the process. At KYANG, there was a small stockpile of limestone that was identified in the 1973 excavations. The transport of these rocks to the sites, especially the interior sites such as KYANG, was intentional as it was not naturally occurring in these locations. There are a few scattered postmolds at these sites which could reflect raised

platforms, but patterning of these postmolds has not been attempted. The coincidence of large amounts of fire-cracked rock and burnt limestone at the fishing camps may signify the largescale process of drying and smoking fish, along with other meats.

Figure 24. Large piles of fired rock from test unit excavation at the Old Clarksville Site (12CL1). Used with permission by Donald E. Janzen.

One example of a cluster of features that may be associated with fishing was identified at the Buffalo Run site (15BU463). This site is located south of the City of Shepherdsville in Bullitt County, south of the Falls of the Ohio, in a generally rural area at the confluence of Buffalo Run and the Salt River (see Figure 1). The site lies upriver from the Hornung site (15JF60). The site, identified by Arnold (2004) was more intensively investigated between 2008 and 2010 by means of a staged series of CRM compliance investigations (Wetzel et al. 2017). Within the relatively narrow sewer line corridor that was excavated, 18 cultural features and one human burial were encountered as well as a large living surface. Artifact density of the midden deposits was generally low to moderate; however, the features, which were large and diverse in form and function, yielded numerous diagnostic artifacts. In all, 15,968 artifacts were collected during the combined investigations from the late Middle Archaic through the Late Woodland periods. The recovered assemblage included 169 bifaces, 87 of which were temporally diagnostic projectile points. Also, 27 cores, 137 flake (unifacial) tools, and 13 groundstone tools were found; fire-cracked rock was abundant. Of interest, there were 780 pieces of fired clay, 660 of which derived from a single pit feature. These were not potsherds; they did not have the morphology or tempering to support an identification as ceramic vessels. Likewise, they were not fragments of daub, and not postmolds that would indicate a structure were found at the site. Various other suggestions have been offered, but none are without problems. There was not firing in the large pit in which many of these objects were found, so they likely do not reflect an incidental origin.

Another suggestion was that they may have served as cooking balls which are known to have occurred at the Falls during the Archaic period. However, they lack the morphology and size of the known examples in the region.

Of relevance to this paper, there was a group of large features (Feature 12 through 16 and Feature 18; Figure 25, Figure 26, and Figure 27) concentrated into one area of the site not far from the terrace edge of the Salt River. The features were similar. Each was identified by the presence of a large amount of fired and degraded limestone rocks and slabs on the ground surface, as well as moderate dark staining. Each feature was roughly oval in plan view and quite large, ranging in maximum length from 118 centimeters (46.4 inches; Feature 14) to 186 centimeters (73.2; Feature 15) long. With the exception of Feature 15, which was the westernmost of this group of features, these were discovered at a slightly higher elevation than the other features uncovered at the site. It is possible that the high concentration of limestone rock on the surface of these features precluded the plow from extending deeper in this area, also preserving a small portion of an intact living surface around the perimeter of the rock features. Artifact density of the features was surprisingly low. The fill of each of these rock features was nearly identical with a dark brown to dark yellowish brown (Munsell 10YR 3/3 to 3/4) silty clay loam, with light to moderate charcoal flecking and calcined bone. There was evidence of intense firing with the surface of the limestone slabs exhibiting a bright red color; however, charcoal was found in very low amounts, and no baked clay was identified (Wetzel et. al 2017:452).

The depths of the features was quite shallow, ranging from 7 and 11 inches. There was no basin or pit morphology. These features appear to have been comprised of large slabs of heated limestone that had been laid directly upon the ground surface A possible explanation is that wet grasses or other vegetation was laid upon the heated rocks for the purpose of steaming. As no mussel shell was present at the site, one option is that fish were steamed at this location. Perhaps a rack was raised above the features and fish were laid upon it to be dried. Regardless, this feature cluster appears to have been a communal area for large-scale food processing or cooking. Features of this sort require a more in-depth examination, possibly residue analysis, to determine their function.

Figure 25. Feature 12, Buffalo Run Site (15BU463) being exposed.

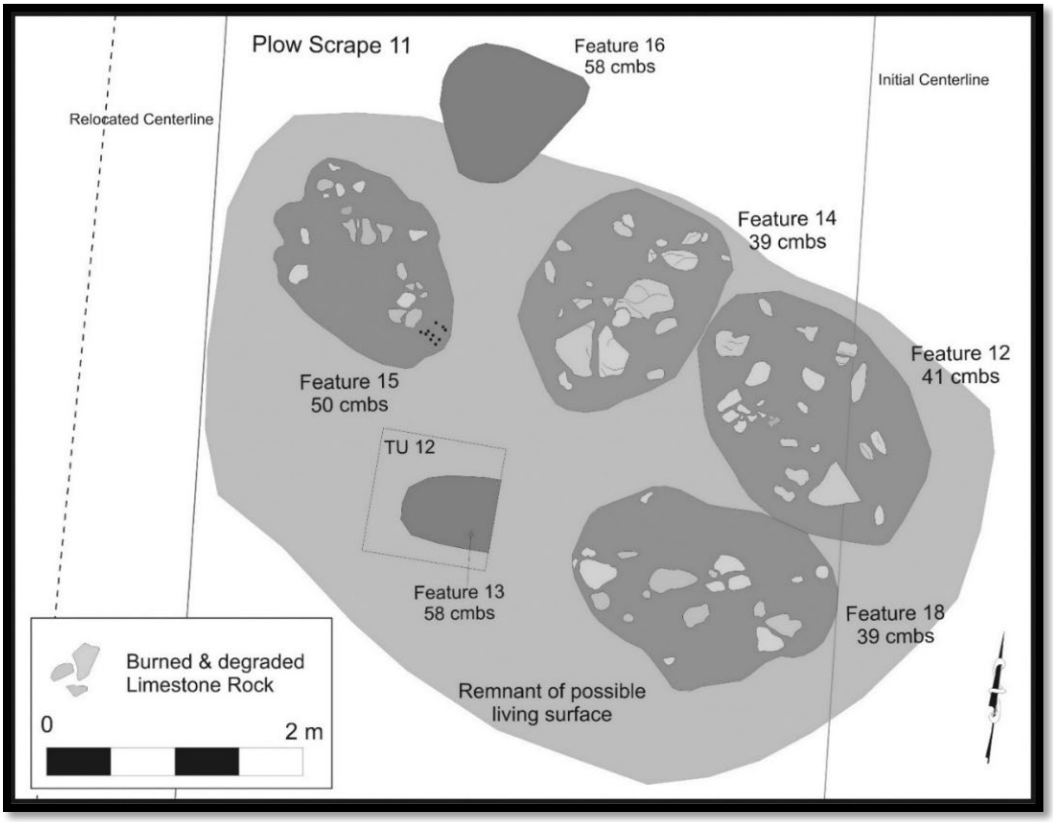

Figure 26. Schematic plan view of Features 12 through Feature 16, Feature 18, site 15BU463

Figure 27. Comparison of feature cluster to other nearby features at site 15BU463.

SEDENTISM AND COMMUNITY

Fish would have been captured in greatest numbers during the spawning runs which occurred at a highly predictable time of the year (Lutins 1992). Seasonal timing was important. The spawn was an annual event that attracted groups to coalesce at a particular location such as the fish weirs. The spawn period could last for six to seven weeks for the drumfish. During this time, the communal activities associated with the spawn offered ample time to reinforce group solidarity. A coordinated effort was necessary during the spawn to perform multiple tasks such as capturing the fish with baskets, nets, or spears; initial processing (removing the unwanted portions of the fish such as head, tail, and fins); and overseeing the drying, smoking, or salting process. These tasks were likely done simultaneously by small groups because fish spoil fast and must be processed quickly. During these tasks, traditional knowledge was transferred between generations. Feasts were known in some societies to have been associated with the spawning period. These seasonal gatherings were accompanied by prayers, blessings, and respect for the resources. At the end, the preserved fish were shared among the families.

The presence of permanent features such as fish weirs has important ramifications regarding interpretations of settlement and mobility. The construction and maintenance of fish weirs is time consuming and labor intensive. It required the collaborative effort of a group of people. The construction itself of weirs has been documented in some societies to be associated with ceremonies that last up to two months. The annual attraction to the fishing grounds is indicative of the site as a persistent place upon the landscape, a place to which the Native groups were drawn on a repetitive basis. The annual draw to the site during the spawn runs reflect an intimate knowledge of the local environmental conditions and the landscape. This familiarity of the area included a knowledge of climatic conditions and fish species which was derived from longterm sustained knowledge of the area, demonstrating “a deep connection between culture and ecology” (Fiveable 2025). The importance of these fishing sites at the Falls is further supported by the establishment of cemeteries at Hornung, Old Clarksville, and KYANG, signaling the critical convergence of natural resources, rights of ownership, and multi-generational spiritual connections.

Fishing on the scale indicated at the Falls of the Ohio River is not characteristic of a society with a high level of residential mobility but rather one with an established and lengthy, if not year-round, residence at a given location. The availability of large quantities of fish, in a restricted area increased the opportunity for sedentism. Fish were an important source of dietary protein that could be stored and used throughout the year. If stored properly, dried fish could last two years. The stored food reduced food insecurities during the winter and enabled longterm residence.

CONCLUSIONS

The Falls of the Ohio River was a natural resource that was ideally suited for the capture of large numbers of fish at certain times of the year. During precontact times, the Falls was a major landmark and persistent place throughout every Native American period. When interpreting the economies, mobility, sedentism, and spiritual aspects of the Archaic at the Falls of the Ohio River, the importance of fishing is often downplayed. Analysis of fish remains at Falls sites indicate that fish constituted a significant percentage of the dietary protein for the Native peoples of the area. The preservation of fish reduced food insecurities, especially during the winter, and further enabled year-round residence and reduced mobility. The scale of fishing at some Middle Archaic sites required a substantial investment of energy into construction and maintenance of weirs and the capture and preservation of the yield. This likely required a collaborative effort that required the annual congregation of nearby groups. It is highly probable, based on observed behaviors in historic times, fishing was a communal activity with celebrations, prayers, ritual, and sharing of traditions and technology.

In Archaic times, the evidence for the presence of specialized fishing encampments at the Falls is undeniable. Bone and antler artifacts in-quantity testify to the variety of fishing technologies in use during this period. The remains of the fish themselves are plentiful, though the narrow range of exploited species is likely due to inadequate and inconsistent methods of data recovery. The evidence for the processing of the fish is, however, less evident in the archaeological record. The lack of evidence is due to poor preservation, the practice of indigenous waste reduction measures, inadequate archaeological data recovery methods, and more.

Yet sometimes, the failure to consider the importance of fishing in Native societies reflects perspective; if the evidence is not immediately obvious, it is not sought. It is often the case, that despite the presence of an archaeological site in a location with great natural potential for fishing, the importance of fishing is simply not acknowledged. There is a need to be more cognizant that some of the features and artifacts encountered during fieldwork could be associated with fishing. The peoples of the Falls of the Ohio were hunters and gatherers…of course they were. But importantly, they were expert and skilled fishermen.

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EXAMINING THE YANKEETOWN PHASE OCCUPATION AT THE KREITZER SITE (12VG2104) IN SOUTHWESTERN INDIANA, LOWER OHIO RIVER VALLEY

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ABSTRACT

In 2022, Gray & Pape, Inc., conducted geoarchaeological investigations for the I-69 Ohio River Crossing Project in Vanderburgh County, Indiana. All work was conducted in compliance with Section 106 of the National Historic Preservation Act, on behalf of the Indiana Department of Transportation. Field efforts were conducted on the floodplain of the Ohio River. The Kreitzer Site (12VG2104) was identified during deep testing efforts. The site consisted of a buried and stratified Yankeetown phase (AD 700–1200) occupation. Subsequent data recovery efforts conducted in 2023 and 2024 also identified a Mississippian Angel phase occupation. This paper will focus on the results of deep testing and data recovery efforts and concentrate on the Yankeetown component, examining resulting geoarchaeological, lithic, ceramic, radiometric, faunal, and macrobotanical analysis. Our investigations suggest that the Yankeetown occupation consists of several ephemeral and short-term campsites dating between AD 789 to AD 1200.

INTRODUCTION

Geoarchaeological investigations conducted by Gray & Pape, Inc. (G&P) for the I-69 Ohio River Crossing Project (ORX) in Vanderburgh County, Indiana, identified a buried and stratified archaeological site, the Kreitzer Site (12VG2104), on a remnant levee of the Ohio River (Figure 1). Archaeological work determined that the Kreitzer Site, dated to the Yankeetown phase (AD 700–1200) according to pottery recovered from feature contexts. The Kreitzer Site was recommended eligible for listing in the National Register of Historic Places (NRHP) under Criterion D, for its potential to yield significant data regarding the Yankeetown phase in southwestern Indiana. The Indiana Department of Transportation (INDOT) and the Indiana State Historic Preservation Office (SHPO), the Division of Historic Preservation and Archaeology (DHPA) concurred with the recommendations. Avoidance of the site was recommended; however, if the site could not be

avoided; then Phase III Data Recovery Efforts were recommended to mitigate adverse effects from the bridge and roadway alignment. As the site fell within the project right-of-way (ROW) and could not be avoided, Phase III Data Recovery Efforts were conducted in 2023 and 2024. During these investigations, additional data was recovered regarding the Yankeetown phase occupation. Additionally, a Mississippian Angel Phase component was also identified. The following paper will concentrate solely on the results of the Yankeetown phase component found at the site.

Figure 1. Drone Imagery of the Kreitzer Site, Fall 2023. View to the South with Ohio River in the background. Drone Imagery by Jason Kovacs, G&P.

PROJECT BACKGROUND

Archaeological investigations for the ORX project were conducted for the Parsons Corporation and was funded by the Federal Highway Administration (FHWA) and administered by INDOT. The Kreitzer Site falls within the ROW for the roadway which approaches the Ohio River Bridge.

As mentioned, the Kreitzer Site sits on a remnant levee of the Ohio River, approximately 0.66 kilometers (km) north of the current channel of the Ohio River. The site area is relatively flat and is bound on the north by a swale that is regularly flooded (Figure 2).

Figure 2. Drone imagery of the Kreitzer Site, April 2024 showing inundated swale, view to northwest. Drone Imagery by Jason Kovacs, G&P.

The site covers an area of 1.16 hectares (ha); however, only 0.94 ha are found within the project ROW. Archaeological investigations conducted at the site included backhoe trenching (BHT), geophysical survey, hand excavated units (XUs), feature excavations, and mechanical removal of the plowzone and other sediments (Figure 3; Trader et al. 2025). In total, 17,377 artifacts were recovered from the site; however, because I am focusing solely on the Yankeetown phase, only artifacts recovered from secure Yankeetown phase contexts will be reported here.

Figure 3. Phase III Data Recovery Efforts at the Kreitzer Site (12VG2104).

Seventeen Yankeetown features were identified during geoarchaeological and Phase III Data Recovery Efforts (Figure 4). Together, these features yielded 1,539 artifacts or an 8.85%

sample of the entire artifact assemblage. More artifacts were recovered from XUs, but only the pottery from features can be easily separated into Yankeetown phase and Mississippian components.

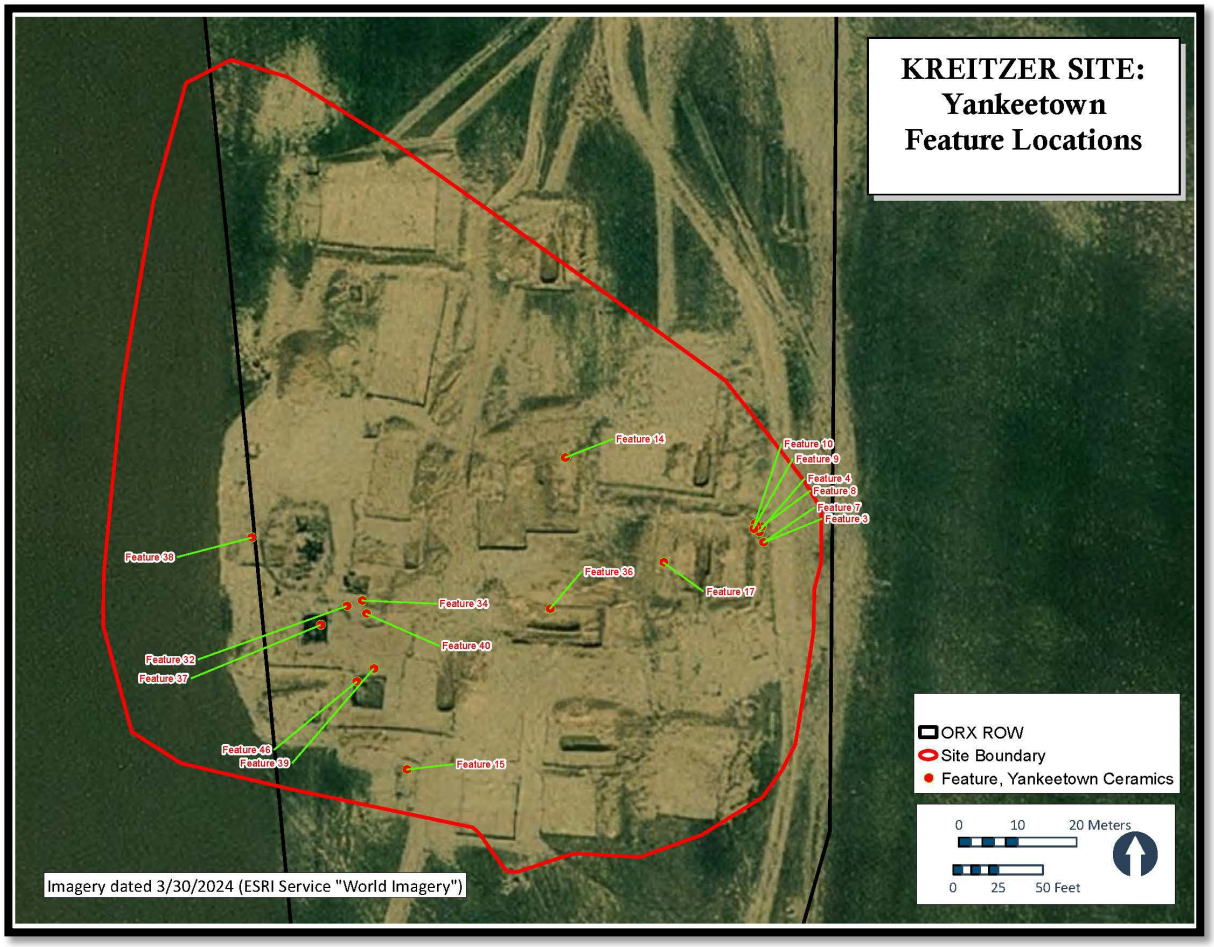

Figure 4. Distribution of Yankeetown phase features.

ENVIRONMENTAL SETTING

The Kreitzer Site is found within the Interior Low Plateaus Province as defined by Thornbury (1965). Specifically, the site is encompassed within the Southern Hills and Lowlands Region and is found south of the southernmost extent of the Wisconsin Ice Sheet (Gray 2000:7). The Ohio River shaped the landscape where the site is located. Mechanical boring identified a higher T1/T2 terrace and a lower T0 terrace system consisting of floodplain and levee/crevasse splay complex along the river. The Kreitzer Site is found on the T0 terrace (Kolb 2022).

The region is drained principally by the Ohio River and smaller tributaries, such as Eagle and Pigeon Creeks. The Ohio River is an eighth-order stream with a watershed that covers an area of 420,000 km^2. Large flooding events occur in March and April and consist primarily of

snowmelt from winter snowpack or rain on snow events. While rainstorms are important locally, they are not large enough to cover the entirety of a large watershed, such as the Ohio River (Gibson et al. 2022:5).

The Ohio River drainage is divided into the Upper Ohio River Valley and the Lower Ohio River Valley. The Lower Ohio River Valley begins at Cincinnati, Ohio and terminates at the confluence of the Ohio and Mississippi rivers. The Lower Ohio River Valley is broken into three geomorphic subdivisions: glaciated, constricted, and alluvial valleys. The first two are bedrock controlled. The Kreitzer Site is found in the alluvial valley, where the river meanders across a broad valley responsible for the formation of numerous river terrace levels, ridge-and-swale topography, and oxbow lakes (Counts et al. 2015:73–74).

Soils at the Kreitzer Site belong to the Huntington Association, which are well drained and found on floodplains and formed in loamy, gravelly materials (University of California [UC] Davis 2025). Soils mapped at the site consists of Huntington, silty clay loam, 0-2% slopes (Ht). These soils are well drained, found on floodplains and natural levees, and exhibit an A-Bw1-Bw2-C soil sequence. These soils have been defined as Mollisols, which can be very dark colored and have a mollic epipedon. They may also have argillic (Bt) horizons. Bettis (1992:125) defines Mollisols formed from Late Holocene-age (LH) alluvium and deposited after 3500 years BP. Bettis (1992:125) indicates that LH-age deposits are found in the modern floodplain and can overlap older deposits. These soils have cambic (Bw) horizons and lack albic (E) horizons. Bettis (1992:125) notes that these soils developed over the past 1,500 to 1,000 years. Archaeological deposits expected in these soils would range from the Late Archaic through Contact periods.

The spread of Late Precontact cultures in the Lower Ohio River Valley (i.e. Late Woodland, Fort Ancient, and Mississippian, AD 800 and 1300) corresponds with the Medieval Climatic Anomaly (MCA; AD 950–1250). The beginning of the MCA is convergent with the beginning of the Yankeetown phase, while the end of the climatic period overlaps near the terminus of the Yankeetown phase and falls within the Angel 2 phase (AD 1200–1365). During the MCA, the region was characterized by an extended warm period, ample rainfall, and milder winters, which was favorable for the adoption of maize agriculture (Bird et al. 2017; Wright et al. 2023:2).

As defined by Braun (2001:122) the Kreitzer Site is found in the Hill Section of the Western Mesophytic Forest Region. This region is considered a transition zone between the Bluegrass to the east and the younger glaciated lands to the north. Pollen analysis identified 11 tree species including alder (*Alnus* sp.), birch (*Betula* sp.), hickory or pecan (*Carya* sp.), oaks (*Quercus* sp.), walnut (*Juglans* sp.), pine (*Pinus* sp.), hemlock (*Tsuga* sp.), American basswood (*Tilia americana*), bigtooth aspen (*Populus grandidentata*), downy poplar (*Populus heterophylla*) and elms (*Ulmas alata*). Flowering plants included those in the parsley/carrot family (Apiceae), mustard family (Brassicaceae), Jacob's ladder (*Phlox* sp.), buttercup family (Ranunculaceae), and rose family (Rosaceae). Many of these species could be used as herbs. The most common pollen recovered from the site included grasses (Poaceae). Semi-aquatic plans included sedges (*Carex* sp.), reeds (*Sparganium* sp.), and cattails (*Typha* sp.; Trader et al. 2025).

SITE STRATIGRAPHY

Site stratigraphy was determined from BHT and XU excavations. Stratigraphy across the site was relatively consistent and was comprised of an Ap-Bw-Bt-BC-C soil sequence. The Ap horizon ranged from 20 to 40 centimeters (cm) in thickness and consisted of Late Holocene aged deposits and represented recent and post-settlement alluvium. The Bw horizon was found directly beneath the Ap horizon and dates to the Late Holocene, during the Mississippian and Yankeetown components.

The Bt horizon occurs around 50 cmbs and comprises a paleosurface that corresponds with the midden deposit at the site (Trader et al. 2025:11-37). The top of the Bt horizon was encountered between 35 and 108 cmbs suggesting that the surface at the time of occupation was rather undulating. The average depth on which the Bt horizon was encountered was 59.68 cmbs. The base of the Bt horizon occurs between 86 and 153 cmbs. The average thickness of the Bt horizon was 58.4 cm. Phytolith analysis suggests that a stable surface occurs about 50 cmbs. The Bt horizon is considered to be associated with the Hyatt Island member of the Martinsville formation (Trader 2025:11-38).

Buried Yankeetown phase components have been found at the Yankeetown Site, between 0.45 and 0.91 m below surface (Vickery 1970:21). Garniewicz et al. (2009:110) reported the Yankeetown component began under 0.60 m of historical alluvium and extended to 0.90 m below surface. The midden was 0.30 m thick. Redmond (1986:16-4-45) notes a buried Yankeetown phase component at site 12PO50, eroding from the Ohio River cutbank between 0.50 and 0.75 m below surface. It is interesting that at least three Yankeetown phase occupations are buried under 0.40 to 0.50 m of alluvium, including the Yankeetown Site, 12PO50, and the Kreitzer Site. Garniewicz et al. (2009) indicate that the Yankeetown component at the Yankeetown Site is buried under historical alluvium. The same is true for the Kreitzer site. These sites were buried under post-settlement alluvium (PSA), which occurred because of land clearing during the early portion of the nineteenth century (Trader et al. 2025:28-33).

YANKEETOWN PHASE

The Yankeetown phase is a well-defined Late Woodland cultural manifestation widely distributed across Indiana, Kentucky, and Illinois along the main stem of the Ohio and Wabash Rivers (Figure 5). Yankeetown phase pottery has been found as far west as the American Bottom in Illinois, particularly at upland Richland Complex sites (Alt 2006). The Yankeetown phase is characterized by a distinctive pottery style that is grog-tempered, and decorated with punctations, zoned incised lines, bar stamping, and a notched fillet design. Identified pottery consists of globular jars and bowls with folded rims (Blasingham 1953; Redmond 1990). The

Yankeetown phase has been referred to as emergent Mississippian because of similarities with Mississippian artifact classes, including pottery trowels, projectile points, chipped-stone hoes and polished hoe flakes, and a reliance on maize (Blasingham 1953; Redmond 1990).

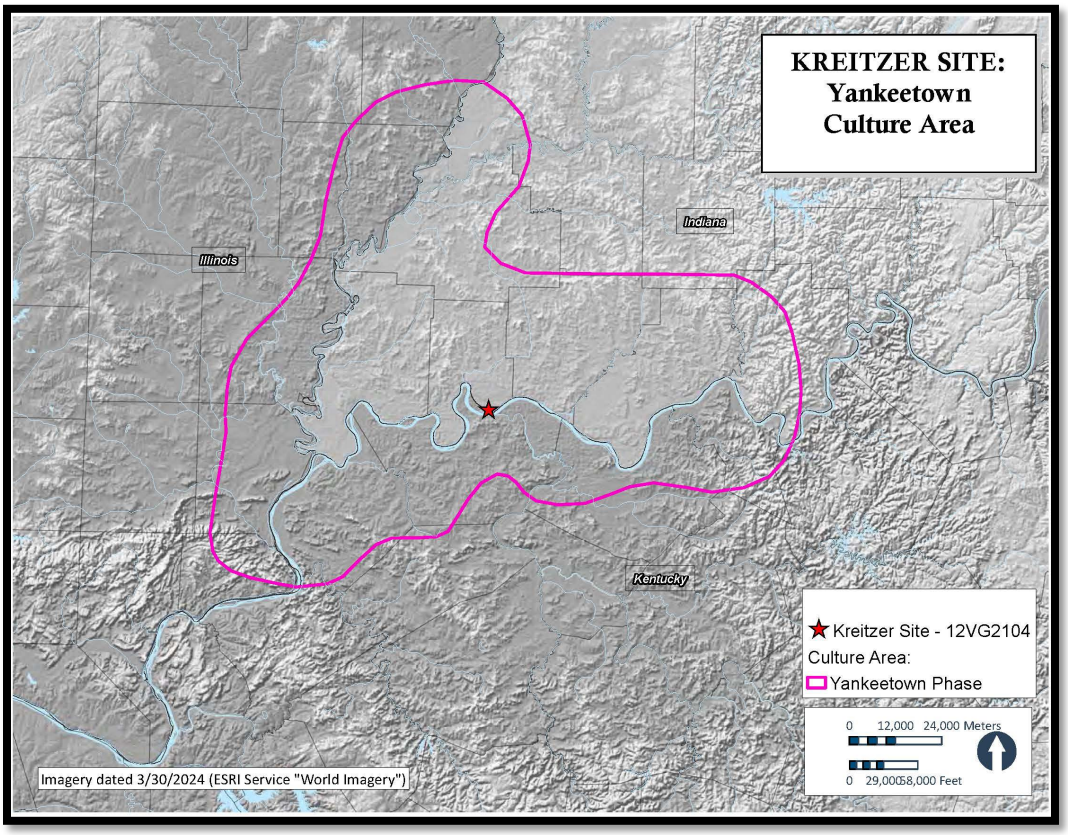

Figure 5. The Kreitzer Site in relation to the Yankeetown phase region

The Yankeetown Site (12W1) in Warrick County, Indiana, is the type site for the Yankeetown phase. The Yankeetown Site is multicomponent with Archaic, Early Woodland, Late Woodland, and Mississippian components (Blasingham 1965). The Yankeetown Site was brought to the attention of Glenn A. Black in 1938 by Smtih Hazen, who found artifacts eroding out of the cutbank of the Ohio River near the community of Yankeetown, approximately 9.6 km upstream from the Angel Mound (12VG1) site (Blasingham 1953:25; Vickery 1970). The Yankeetown component is buried and found between 45.7 and 91.4 cm below the ground surface (Vickery 1970:21). The base of the Yankeetown component is bounded by the Early Woodland component; while the top is covered with the Mississippian component (Trader et al. 2025).

The remainder of this article will examine ceramic, lithic, radiometric, and macrobotanical data recovered from the Kreitzer Site Yankeetown component and how it relates to other Yankeetown sites within the Yankeetown Universe.

ARTIFACT ANALYSIS

A summary of artifact classes recovered from Yankeetown phase features is provided in Table 1. Eight artifact classes were identified including bifacial tools burned earth, debitage, faunal remains, fire-cracked rock (FCR), ground/pecked/battered stone, miscellaneous artifacts, pottery, and retouched flakes (Trader et al. 2025).

Table 1. Frequency of Yankeetown phase artifacts from feature contexts.

Feature Number	Artifact Class								Total
	Bifacial Tools	Debitage	Faunal Remains	FCR	Ground/Pecked/Battered Stone	Burned Earth	Pottery	Retouched Flakes	
3	--	57	51	36	3	41	132	--	320
4	--	--	--	--	--	--	2	--	2
7	--	--	3	--	--	1	--	--	4
8	--	1	2	--	--	--	1	--	4
9	--	--	1	--	--	--	--	--	1
10	--	1	--	--	--	--	1	--	2
14	--	6	21	--	--	9	18	2	56
15	--	--	--	--	--	--	6	--	6
17	--	--	--	--	--	--	4	--	4
32	--	2	1	--	--	1	7	--	11
34	--	38	28	2	--	18	75	--	161
36	--	3	218	--	--	65	18	--	304
37	--	3	6	--	--	88	14	--	111
38	--	--	--	--	--	20	3	--	23
39	--	6	8	--	--	7	13	--	34
40	1	51	205	--	--	7	46	1	311
46	--	19	32	2	--	86	46	--	185
Total	1	187	576	40	3	343	386	3	1539

Pottery Description

The most distinctive and diagnostic artifact is pottery. The pottery assemblage was analyzed by Patrick Trader and Sam Vogel of G&P. Of the 386 sherds collected, 111 consisted of body sherds, 18 were rims, 2 were basal sherds, and 255 were small sherds less than 4 square centimeters (cm^2) that were not formally analyzed. In total, 131 sherds (34%) were formally analyzed. Pottery was found in all feature contexts except for Features 7 and 9. Temper was identified for 130 sherds. Eighty-two percent (n = 107) of the pottery was grog/grit tempered, and the remainder was tempered with grog (n = 7), grog/limestone (n = 1), grog/sand (n = 1) and grit/sand (n = 1). Seventy-one percent (n = 93) exhibited a plain exterior surface (Figure 6), two had a brushed surface, three were cordmarked (Figure 7), one had punctations (Figure 8), two were smoothed, and one was indeterminate (Trader et al. 2025).

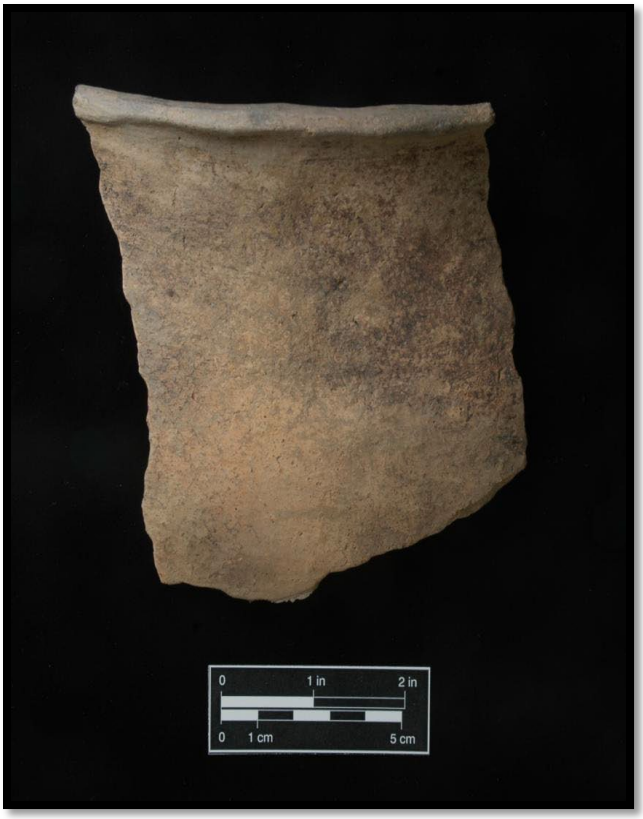

Figure 6. Vessel 11 (OA# 82), representative jar fragment with plain surface

Figure 7. Cordmarked surface.

Figure 8. OA #150, body sherd with punctations and incised line.

Of the identified rims, 13 were plain, 1 was scalloped/pie crust and 1 was castellated (Figures 9 and 10). Five of the rims were flared, four were slightly excurvate, three had inslanting curved walls, and four of the rims were direct. Three of the rims exhibited lenticular punctations. Lips were either rounded (n = 13) or flat (n = 4). Lips were predominantly plain (n = 15), while one was dowel impressed. Eight of the lips were thickened on the exterior, while seven weren't modified, and one exhibited a rim fold (Trader et al. 2025).

Figure 9. Vessel 137 (OA# 3181) scalloped rim with dowel impressed lip.

Figure 10. Vessel 149 (OA# 3138) slightly castellated rim.

Sixteen jars were identified and one bowl (Figures 6 and 11). The diameter could be determined for six jars, which ranged between 12 and 34 cm in diameter. One bowl had a diameter of 48 cm. Vessels were determined by the presence of a rim and lip. While some body sherds were likely to represent individual vessels, it was determined that only rims with lips would be used to determine the minimum number of vessels. Using these parameters, 11 distinct vessels were identified as Yankeetown Wares and included Vessels 11, 12, 23, 26, 40, 63, 109, 124, 137, 145, and 149 (Table 2; Trader et al. 2025).

Figure 11. Vessel 12 (OA# 84 and 85) bowl with rim fold.

Table 2. Yankeetown Wares, Minimum Vessel Attributes

10	OA#*	Provenience	Segment	Thickness (m)	Orifice Diameter (cm)	Vessel Form	Ceramic Surface Treatment	Surface Decoration	Rim Attribute	Lip Attribute
11	82	Feature 3	Rim	8.48	32	Jar	Plain	N/A	Flaring	Rounded
12	84/85	Feature 3	Rim	10.4	48	Bowl	Plain	Interior fingernail or small tool impressions	Exterior rim fold	Exterior rounded
23	3192	Feature 38	Rim	--	--	Indeterminate	Plain	N/A	Direct	Flat
26	3002	Feature 14	Rim	1.32	--	Jar	Plain	N/A	Slightly Excurvate	Flat
40	3133	Feature 40	Rim	5.02	--	Indeterminate	Plain	N/A	Inslanting curved wall	Flat
43	3143	Feature 49	Rim	7.56	24	Jar	Plain	Three notches on lip	Slightly excurvate	Rounded
63	3139	Feature 40	Rim	5.74	28	Jar	Plain	N/A	Slightly excurvate	Flat with square corners
124	3208	Feature 46	Rim	5.91	--	Indeterminate	Plain	N/A	Direct	Exterior rounded
137	3181	Feature 38	Rim	7.4	--	Indeterminate	Plain	Lip dowel impressed	Scalloped/pie crust	Rounded
145	3088	Feature 40	Rim	6.11	--	Indeterminate	Smoothed	NA	Direct	Exterior rounded
149	3138	Feature 27	Rim	--	34	Jar	Smoothed	N/A	Castellated	Rounded

*Order of Analysis

Chipped-stone Tool Assemblage

The chipped-stone tool assemblage was analyzed by Eric Edelbrock of G&P and consisted of bifacial tools (n = 1), debitage (n = 187), and retouched flakes (n = 3). A variety of raw materials were used to manufacture the chipped-stone assemblage and consisted of gravel cherts (n = 48), Holland (n = 1), quartzite (n = 4), unidentified chert (n = 132), and Wyandotte (n = 6). The one bifacial tool was manufactured from quartzite and consisted of a biface-perforator. Retouched flakes consisted of two scrapers manufactured from gravel cherts, and a uniface manufactured from Wyandotte chert (Trader et al. 2025).

Eight flake types were identified in the debitage assemblage and include initial reduction flakes (n = 16), flakes of unspecified reduction sequence (n = 24), biface initial reduction flakes (n = 1), biface thinning flakes (n = 6), biface finishing flakes (n = 52), flake fragments (n = 18), angular shatter (n = 24), and microdebitage (n = 44). Seventy-five (40%) diagnostic flake types included initial reduction flakes, biface initial reduction flakes, biface thinning flakes, and biface finishing flakes. Initial reduction activities comprised 21.3% of diagnostic flake types, while biface reduction and maintenance comprised 78.6% of diagnostic flake types. Little initial reduction occurred during the Yankeetown phase occupation, while biface maintenance and resharpening were significant activities. The only tools manufactured from Wyandotte chert consisted of a uniface from Feature 40. Interestingly, 83.3% of Wyandotte chert was recovered from Feature 40; one other piece was found in Feature 34 (Trader et al. 2025).

Ground/Pecked/Battered Stone Assemblage

Ground/Pecked/Battered stone was analyzed by Hannah McKinstry of G&P and included one battered cobble manufactured from sandstone, one pitted stone manufactured from sandstone, and a miscellaneous groundstone artifact manufactured from a sedimentary rock (Figure 12). The battered cobble exhibited battering on two large surfaces as well as along one edge. The pitted stone exhibited two pits. One pit is pecked and modified from a natural indentation creating a pit 27.11 m in diameter, while the second pit has a diameter of 23.95 mm and a depth of 7 mm. The final artifact is a flat sedimentary stone that has been polished on one face and might be a partially formed gorget (Trader et al. 2025).

Figure 12. Ground/pecked/battered tools from Feature 3. Left, a pitted stone (OA# 77); Right, a battered stone (OA# 20).

Faunal Remains

Faunal remains were analyzed by Hannah McKinstry of Gray & Pape. Ninety-four percent (n = 545) of faunal material consisted of small, unidentifiable, calcined fragments of bone. The majority of these (40%, n = 218) were recovered from Feature 36; an additional 36% (n = 196) were recovered from Feature 40. Unidentifiable mammal bone was recovered from Feature 32 (n = 1), and Feature 40 (n = 1). The only identifiable mammal species included white-tailed deer (*Odocoileus virginianus*) and beaver (*Castor canadensis*). White-tailed deer remains were recovered from Features 14 (n = 1) and 40 (n = 8). An antler fragment was recovered from Feature 14 and 8 teeth fragments were recovered from Feature 40. Twenty beaver teeth fragments were recovered from Feature 40. The faunal assemblage indicates that terrestrial and semi-aquatic mammals were hunted and brought back to the site (Trader et al. 2025).

Archaeobotanical Remains

Archaeobotanical Remains from the Kreitzer Site were analyzed by Karen Leone of Santa Fe, New Mexico. The Yankeetown archaeobotanical assemblage consisted of 1,974 charred plant

remains that consisted of wood, nuts, seeds, and squash rind recovered from Featured 3, 36, and 39 (Trader et al. 2025:20-23). The wood assemblage comprised 97.3% of the Yankeetown component and included walnut (*Juglans sp.*), black locust (*Robinia pseudoacacia)*, elm/hackberry (*Ulmaceae*), ash (*Fraxinus sp.*), and maple (*Acer sp.*). All these species would have been available in the surrounding forests near the site (Trader et al. 2025:20-24). Twenty-four nut fragments were recovered and included 15 pieces of hickory nutshell (*Carya sp*.), 2 pieces of hazelnut nutshell (*Corylus sp*.), 2 pieces of pecan nutshell (*Carya illinoensis*), 2 pieces of hazelnut nutmeat, 2 pieces of acorn nutmeat (*Quercus sp*.), and 1 piece of pecan nutmeat (Trader et al. 2025:20-25). Feature 3 contained the highest density and variety of nutshell and nutmeat; while Feature 39 only had 2 pieces of acorn nutmeat. No nuts were found in Feature 36 (Trader et al. 2025:20-26).

The Yankeetown corn assemblage is quite sparse, consisting of 2 cupule/glume fragments, and was recovered from Feature 39 (Trader et al. 2025:20-27). The seed assemblage is also rather sparse and consisted of 13 seeds. Two sumac fruit seeds (*Rhus* sp.) and 11 wild bean (*Phaseolus sp*.) were identified. Sumac was found in Features 36 and 39 and likely represents incidental inclusions, while the wild beans were found in Feature 36. No seeds were recovered from Feature 3 (Trader et al. 2025:20-28). Squash rind (n = 14; *Cucurbita pepo*) was recovered from Feature 39 (Trader et al. 2025:20-29). Plant food densities were highest at Feature 3, which represented small-scale nut collection; similarly, wood densities were highest in Feature 3 as well in comparison to Features 36 and 39 (Trader et al. 2025:20-30). Overall, the low plant food densities do not suggest that large scale harvesting and processing of nuts occurred; rather, they indicate small-scale collections during short-term visits (Trader et al. 2025:20-31).

YANKEETOWN CHRONOLOGY AT THE KREITZER SITE

Traditionally, the Yankeetown phase was dated between AD 700–1100 (Redmond 1990; Strezewski 2021). However, recent work at the Yankeetown Site has pushed the Yankeetown component to AD 1230 (Garniewicz et al. 2009). Strezewski (2021) suggests that the terminus for Yankeetown is AD 1200. Three radiocarbon dates fall within the Yankeetown phase at the Kreitzer site and were recovered from Features 3 and 36 (Trader et al. 2025:26-3).

A nutshell fragment from Feature 3 yielded an AMS date of 930 ± 25 BP (UGAMS-67446; 2σ: cal. AD 1034–1168, p = 0.989), while a wood charcoal fragment yielded an AMS date of 890 ± 25 BP (UGAMS-67447; 2σ: cal. AD 1147–1220, p = 0.724). All pottery from Feature 3 was either grog or grog/grit tempered; however, one grog-tempered Mississippi Plain sherd was also recovered (Trader et al. 2025:26-3).

A wild bean fragment from Feature 36 yielded an AMS date of 1240 ± 20 BP (UGAMS-75379; 2σ: cal. AD 684–743, p = 0.445, and AD 786–837, p = 0.442) with a median probability of

AD 789. This is the oldest occupation at the Kreitzer Site and falls within the early portion of the Yankeetown phase. All pottery from this feature was grog/grit-tempered, two sherds of which were cordmarked (Trader et al. 2025:26-4).

Figure 13 is a comparison illustrating AMS dates from Features 3 and 36. All three dates are similar; however, Feature 36 dates to at least 100 years prior to the use of Feature 3. Statistically, the three dates are significantly different at a 95% level of confidence. This suggests that the dates represent different occupations. The earliest Yankeetown occupation represented by Feature 36 ranges between AD 684–837, or a period of 153 years. The later Yankeetown occupation represented by Feature 3 ranges between AD 1034–1220, or a period of 186 years. The greatest range between the two occupations is 477 years, while the shortest range between the two occupations is 207 years. Feature 36 represents an early, ephemeral Yankeetown occupation. Feature 3 likely represents a late or terminal Yankeetown component at the site (Trader et al. 2025:26-4).

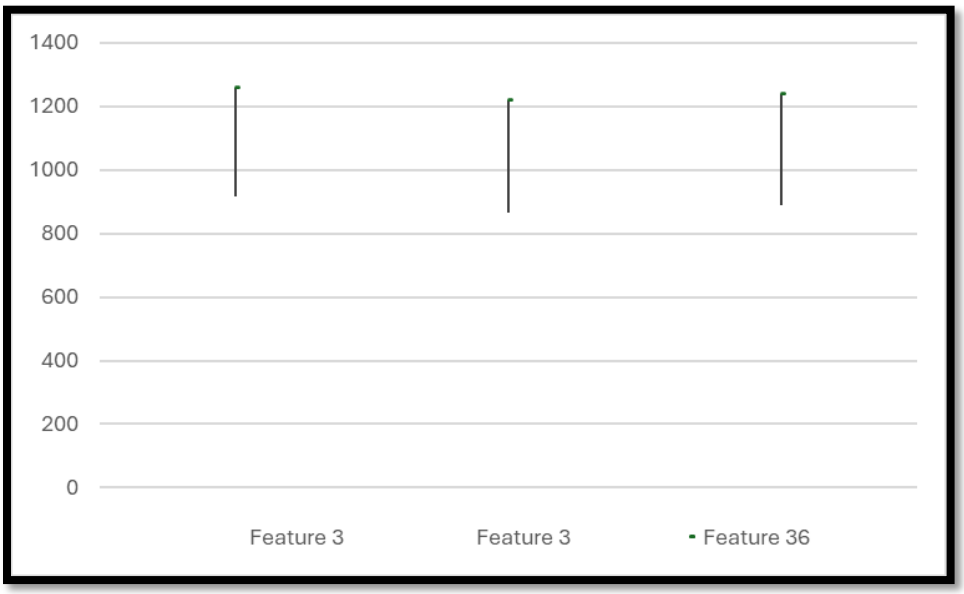

Figure 13. Yankeetown AMS Dates from the Kreitzer Site

Table 3 provides a summary of 26 Yankeetown ^{14}C dates collected from sites in Kentucky (Foster, Stull, and Slack Farm), Illinois (11SA86), and Indiana (Kuester, Yankeetown, Dead Man's Curve [DMC], and Kreitzer). These dates cover a wide range, from the sixth through the fifteenth centuries. Many of these are legacy dates with standard deviations of over 100 years (Trader et al. 2025:26-4).

Table 3. Comparative Radiocarbon Dates from other sites with Yankeetown components.

SITE NAME NUMBER	SAMPLE NO.	FEATURE	RADIOCARBON AGE (BP) ± 1	CALIBRATED AGE 2 RANGE (PROBABILITY)	REFERENCE
Foster 15DA68/69	Beta-42593	Bell-shaped pit	840 ± 50	AD 1147–1278 [p = 0.878]	Sussenbach 1992:105 cited in Strezewski 2021:66
Foster 15DA68/69	Beta-42594	Bell-shaped pit	980 ± 50	AD 991–1179 [p = 0.987]	Sussenbach 1992:105 cited in Strezewski 2021:66
Kuester 12VG71	UGAMS-8452	Feature 72-4 (Wall Trench)	900 ± 25	AD 1120–1218 [p = 0.651]	Strezewski 2014: Table 7.1 cited in Strezewski 2021:66
Slack Farm 15UN28	Beta-62692	Yankeetown feature	1460 ± 60	AD 529–668 [p = 0.917]	Pollack and Henderson 2000:615 cited in Strezewski 2021:66
Slack Farm 15UN28	Beta-62696	Yankeetown feature	1240 ± 50	AD 664–891 [p = 1]	Pollack and Henderson 2000:615 cited in Strezewski 2021:66
Stull 15UN95	GX-7903	Pit feature	860 ± 130	AD 949–1326 [p = 0.947]	Ottesen 1981:145 cited in Strezewski 2021:66
Yankeetown 12W1	Beta-17320	Small pit feature	1220 ± 110	AD 641–1026 [p = 0.998]	Redmond 1990:11-12, 192 cited in Strezewski 2021:66,
Yankeetown 12W1	Beta-17321	Small pit feature	1160 ± 120	AD 653–1049 [p = 0.952]	Redmond 1990:11-12, 192 cited in Strezewski 2021:66,
Yankeetown 12W1	Beta-258695	Riverbank Feature 23	870 ± 40	AD 1121–1264 [p = 0.819]	Greenan, pers comm 2013 cited in Strezewski 2021:66
Yankeetown 12W1	Beta-258697	Riverbank Feature 8	990 ± 40	AD 1058–1158 [p = 0.581]	Garniewicz et al. 2009:113 cited in Strezewski 2021:66
Yankeetown 12W1	Beta-258699	Feature 20, Unit D	880 ± 40	AD 1115–1230 [p = 0.715]	Garniewicz et al. 2009:50 cited in Strezewski 2021:66
Yankeetown 12W1	Beta-258701	Midden, Unit 0	880 ± 40	AD 1115–1230 [p = 0.715]	Garniewicz et al. 2009:113 cited in Strezewski 2021:66

Yankeetown 12W1	Beta-260008	Feature 21, Unit D	1080 ± 40	AD 887–1027 [p = 1]	Garniewicz et al. 2009:52 cited in Strezewski 2021:66
Yankeetown 12W1	Beta-260009	Feature 22, Unit D	870 ± 40	AD 1121–1264 [p = 0.819]	Garniewicz et al. 2009:53 cited in Strezewski 2021:66
Yankeetown 12W1	M-2007	Feature 11	1050 ± 130	AD 772–1226 [p = 0.948]	Dorwin 1968:33
Dead Mans Curve 12PO03	Z4 Post L (ISGS#6650)	Feature 24	690 ± 70	AD 1223–1404 [p = 1]	Alt 2010:51, 129
Dead Mans Curve 12PO03 ISGS#6651	F24-18 (ISGS#6651)	Feature 24	530 ± 70	AD 1287–1483 [p = 1]	Alt 2010:51, 129
Kuester 12VG71	RL-144	Unit SO-W8	1480 ± 120	AD 332–775 [p = 0.978]	Apfelstadt 1973:87
Yankeetown 12W1	?	Small pit feature	730 ± 110	AD 1122–1423 [p = 0.945]	Redmond 1990:11-12,192
Yankeetown 12W1	?	Small pit feature	790 ± 120	AD 1024– 1401 [p = 1]	Redmond 1990:11-12,192
11-SA-86 Area 1	UGa-2699	Feature 123	995 ± 65 B.P.	AD 951–1181 [p = 0.928]	Jefferies and Butler 1982:573,1273, 1468
11-SA-86	UGa-2702	Feature 130	1265 ± 65 B.P.	AD 650–893 [p = 0.989]	Jefferies and Butler 1982:572
Stull 15UN95	—	—	AD 1090 ± 130	AD 756–1179 [p = 0.898]	Ottesen 1981:145 cited in Redmond 1990:11.
Yankeetown 12W1	?	Pit feature	1003 ± 25	AD 993–1048 [p = 0.725]	cited in Watts-Malouchos 2020:64
Kreitzer 12VG2104	UGAMS-75379	Feature 36	1240 ± 20	AD 683–743 [p = 0.445] AD 786–837 [p = 0.442]	Current report
Kreitzer 12VG2104	UGAMS-67446	Feature 3	930 ± 25	AD 1034–1168 [p = 0.989]	Current report
Kreitzer 12VG2104	UGAMS-67447	Feature 3	890 ± 25	AD 1147–1220 [p = 0.724]	Current report

The oldest Yankeetown date is from the Kuester site (12VG71) at 1480 ± 120 BP (RL-144; 2σ: cal. AD 338–775, *p* = 0.978; Apfelstadt 1973); while the youngest date is from the DMC site (12PO03) at 530 ± 70 BP (ISGS-6651; 2σ: cal. AD 1287– 1483, *p* = 1.000; Alt 2010). The earliest date of AD 338 from the Kuester site is too old to be identified as Yankeetown, while the dates from the DMC site are too late to be identified as Yankeetown and more likely fall with the Angel phase (Trader et al. 2025:26-4).

Additionally, one date from the Slack Farm site of 1460 ± 60 BP (Beta-62692; 2σ: cal. AD 529–668, *p* = 0.917) is considered too early to be identified as Yankeetown. Figure 14 is a graphic representation of all the Yankeetown ^{14}C dates. Yankeetown occupations are scattered temporally and do not appear to cluster at any one time (Trader et al. 2025:26-6).

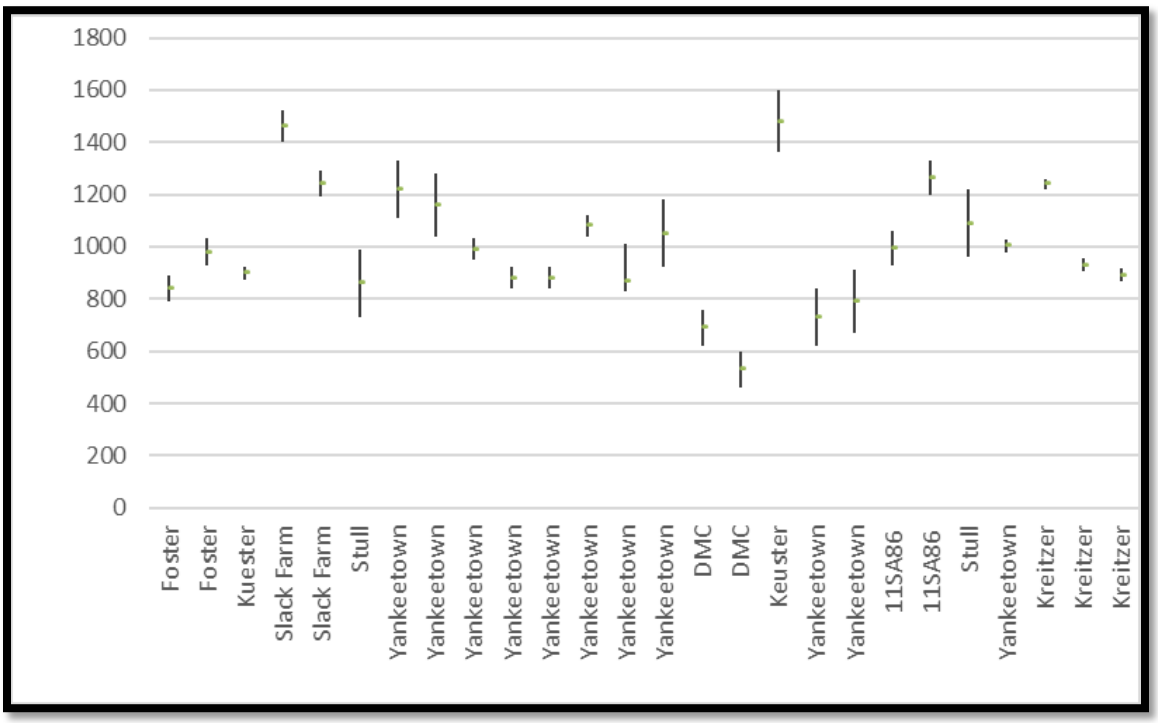

Figure 14. Comparison of all Yankeetown 14C dates

When the legacy dates are removed, as well as the ones from the DMC and Slack Farm sites, there are 15 remaining dates that serve as reliable proxies. Figure 15 illustrates the distribution of ^{14}C dates without those dates. The oldest Yankeetown dates are from Slack Farm, 11SA86, and Kreitzer. These three dates range from 1240 ± 50 BP (Beta-62696; 2σ: cal. AD 668–891; Pollack and Railey 1987) to 995 ± 65 BP (Uga-2699; 2σ: cal. AD 951–1181). The youngest Yankeetown date is from the Foster Site at 840 ± 70 BP (Beta-42593; 2σ: cal. AD 1148–1278, *p* = 0.878; Sussenbach 1992; Trader et al. 2025:26-6).

Examination of Figure 15 shows a cluster of 15 dates between 800 and 1000 BP. These dates suggest a terminus for the Yankeetown Phase around AD 1230. This date overlaps with the Angel 2 Phase (AD 1200–1325) as defined by Hilgeman (2000; Trader et al. 2025:26-6).

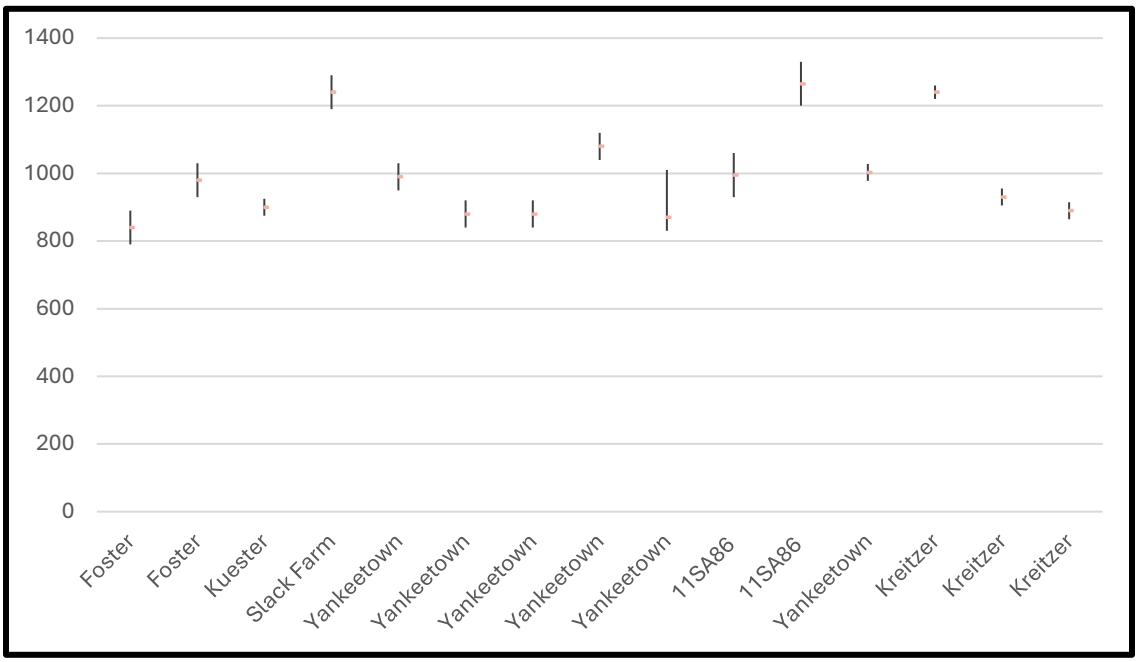

Figure 15. Distribution of Yankeetown 14C dates without Legacy Dates

YANKEETOWN ENTANGLEMENTS

Overall, the Yankeetown occupation of the Kreitzer Site reflects regional traditions found at other Yankeetown sites across the Lower Ohio River Valley. The Kreitzer Site consists of a series of ephemeral, short-term occupations during the Yankeetown phase (AD 789–1200). Plain pottery included typical diagnostic Yankeetown materials such as grog-tempered, plain-surfaced jars, likely used for cooking or storage, and bowls with folded rims. Decorated Yankeetown pottery included incised lines, punctations, bar stamping, and notched lips. Rim decoration included castellations or crenulations. While people at Kreitzer participated and were entangled with the greater Yankeetown universe, some aspects of the Yankeetown phase at the Kreiter Site were not transmitted. These items included pottery with filleted decorations, pottery trowels, and humpbacked knives. These items were not transmitted to Kreitzer Site occupants (Trader et al. 2025:27-2).

The relationship of Yankeetown with the American Bottom and Cahokia in Illinois has long been identified through the presence of Yankeetown phase grog tempered pottery and Indiana chert types (Alt et al. 2011). Yankeetown pottery was found at Cahokia's Tracks 15A and 15B, sub-mound 51, the BBB Motor site, and upland sites associated with the Richland Complex (Figure 16; Alt et al. 2011:14; Emerson et al. 1984; Trader et al. 2025:27-2).

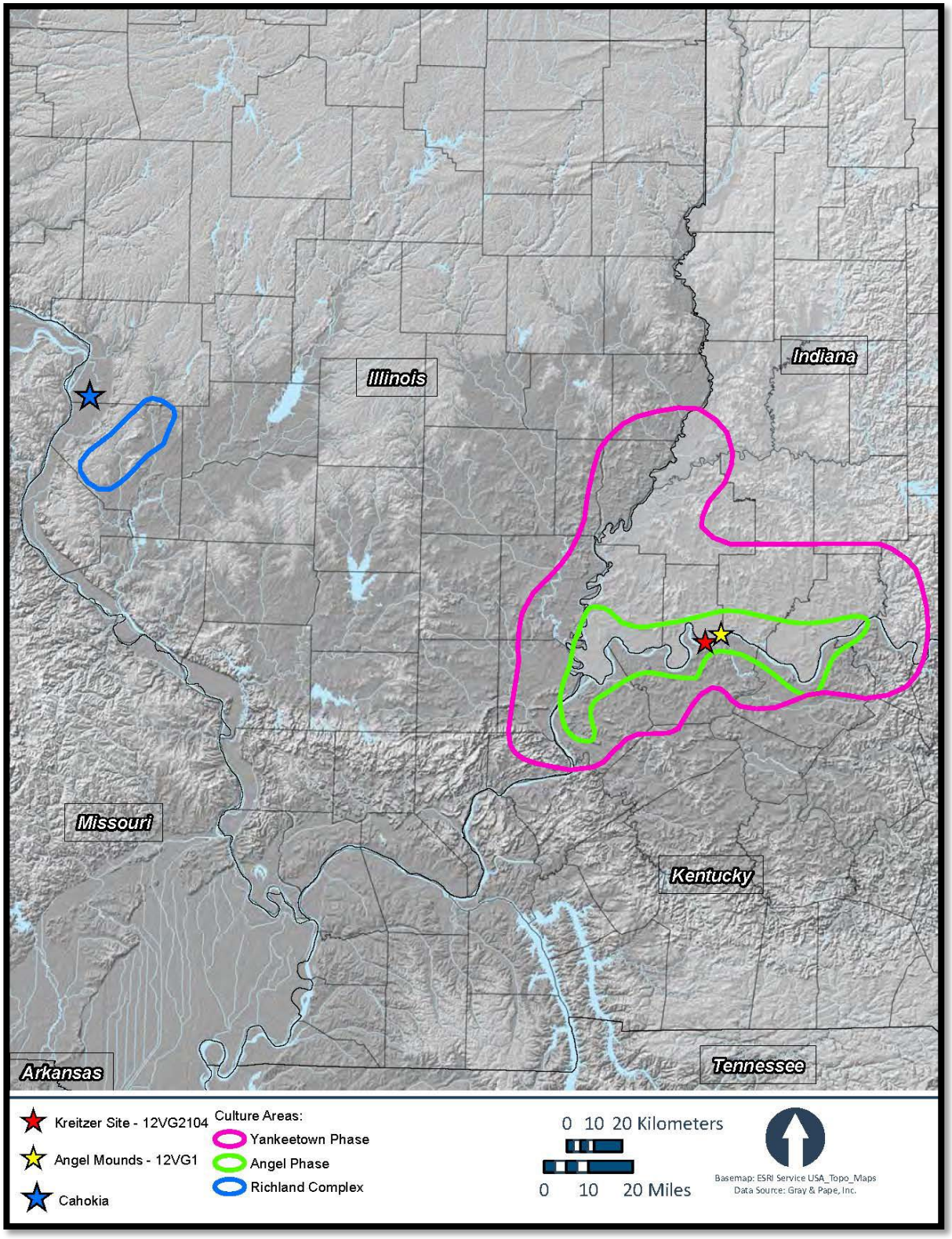

Figure 16. Yankeetown Phase, Angel Phase, and Richland Complex Cultural Regions.

The Richland Complex is a series of upland sites found east of the American Bottom in Illinois. The Richland Complex covers 300 km^2 and dates AD 1000–1150. By AD 1150, all Richland Complex Mississippian sites were abandoned (Pauketat 2003:50). Richland Complex sites with Yankeetown type pottery included the Knoebel, Pfieffer, and Emerald sites. Five percent of vessels at Knoebel were decorated Yankeetown phase pottery (Alt et al. 2011:14). In addition to pottery, Indiana type cherts were also found at Richland Complex sites. The presence of Yankeetown phase pottery and Indiana type cherts suggests that Yankeetown groups resettled in the upland east of the American Bottom (Alt et al. 2013:15). Pauketat (2003:55) suggests that the Richland Complex consisted of resettled farmers, some of whom migrated to the area from southern Missouri and southwestern Indiana. Furthermore, he suggests that the Richland Complex groups adopted some Cahokia traditions and retained traditional pottery and architectural technologies, while rejecting other ideas. This all indicates entanglements between Yankeetown phase groups and other groups in the American Bottom region. Subsequently, all this was part of the overall Mississippianization process, resulting in the "…adoption and hybridization of Mississippian cultural attributes. (Pauketat 2003:56; Trader et al. 2025:27-2).

Recent work on strontium isotopes on human teeth from Cahokia indicated that 26% of individuals examined were non-local to the American Bottom, suggesting they were migrants from outside the region (Hedman et al. 2018:208). It is possible that Mississippianized descendants of Yankeetown migrants resettled back to the Lower Ohio River Valley and helped settle Angel Mounds (Watts-Malouchos 2020). Interestingly, little Yankeetown phase decorated pottery (n = 24) was found at Angel Mounds (Hilgeman 2000).

YANKEETOWN SETTLEMENT

The Yankeetown phase at the Kreitzer Site is represented by diagnostic pottery and AMS dates, recovered from feature contexts. Eleven features (Features 14, 15, 17, 32, 33, 36, 37, 38, 39, 40, 46) and Structure 4, composed of Features 3, 4, 7, 8, 9, and 10, represent the Yankeetown occupation. Of these features, AMS dates were obtained from Features 3 and 36. Feature 36 provided the earliest date for the Yankeetown component (AD 683–837) with a mean probability of AD 789. Feature 3 dates range between AD 1034–1168 and AD 1147–1220, suggesting a later Yankeetown component. However, Feature 3 is found deeper than Feature 36. Features 3 (4, 7, 8, 9, and 10), 15, and 36 are found between 1.20 and 1.40 m below surface. Phytolith data suggests that a stable landform is found between 1.30 and 1.50 m below surface. It is possible that this landform was exposed for a significant amount of time, allowing sporadic settlement throughout the Yankeetown phase. Other Yankeetown phase features were found between 0.40 and 0.80 m below surface (Trader et al. 2025:28-31). As noted previously, phytolith studies identified a stable surface between 0.50 and 0.70 m.

Yankeetown phase pottery from features, comprised 6.4% (n = 386) of all pottery from the site. However, if we eliminate all small sherds <4 cm^2, which were not formally analyzed, then 11.5% (n = 146) of the feature pottery assemblage is assigned to the Yankeetown phase. Most (n = 120, 82.3%) are grog/grit tempered and 6.1% (n = 9) are grog tempered. Grog tempering is a diagnostic component of the Yankeetown phase (Blasingham 1953; Redmond 1990). Yankeetown pottery at the Kreitzer Site have predominately plain surfaces (n = 93, 63.7%); while a small percentage are cordmarked, brushed, smoothed, or punctated (n = 7, 4.8%). Most of the Yankeetown phase pottery at other Yankeetown sites have plain exteriors (Blasingham 1953; Redmond 1990). Only one sherd was punctated from Yankeetown feature contexts. No bar stamping, incised lines, or fillet decorations were noted on any Yankeetown pottery from feature contexts. Blasingham (1953:35) found that 10% of Yankeetown pottery was decorated; however, this does not include the" plain" pottery that included notched rims. Redmond (1990:74, Table 3-3) found that about 40% of Yankeetown pottery was decorated. At the Kreitzer, 17 jars and one bowl were identified. The Yankeetown phase pottery assemblage at the Kreitzer Site is like that found at other Yankeetown sites in the region (Trader et al. 2025:28-32).

Archaeobotanical analysis was conducted for three Yankeetown phase features (Features 3, 36, and 39). No cultigens were recovered from Features 3 or 36. Carbonized wood from these features included walnut, ash, elm/hackberry, black locust, and maple. Charred nut remains were recovered from Feature 3 and Feature 39 (hazelnut, hickory, pecan, and acorn). Seeds were recovered from Features 36 (wild bean and sumac) and 39 (sumac). Feature 39 is the only Yankeetown feature that contained any evidence of cultivated plants (maize cupules and squash rind; Trader et al. 2025:28-32).

Like other Yankeetown phase sites in the region, the archaeobotanical assemblage at the Kreitzer Site is rather limited. Turner and Bush (2016:69) report that older cultigens, such as chenopod (*Chenopodium berliandieri*), erect knotweed (*Polygonum erectum*), maygrass (*Phalaris caroliniana*), little barley (*Hordeum pusillum*), sunflower, and marsh elder (*Iva annua*) dominate maize (*Zea mays*) remains at Yankeetown phase sites. Maize remains were found from one feature at the Dead Man's Curve site (12PO33), and some corn cobs were found at the Yankeetown site in 2008 by the Indiana State Museum (Turner and Bush 2016:69; Trader et al. 2025:28-32).

Yankeetown features consisted of cooking hearths (n = 7), refuse pits (n = 3), undefined thermal features (n = 1), and Structure 4, a circular post structure with five posts and an associated cooking hearth. Cooking hearths are defined by a reddened, fire-baked base with multiple artifact classes. Similar features were identified at the Yankeetown Site (Vickery 1970; Garniewicz et al. 2009). Other features at the Yankeetown Site included basin-shaped, straight-sided, and bell-shaped storage and refuse pits (Redmond 1986:16-4-6). Basin-shaped and straight-sided pits were identified at the Kreitzer Site; however, no bell-shaped pits were identified. Possible Yankeetown phase structures were identified at the Yankeetown Site by

Garniewicz et al. (2009), consisting of a possible structural basin and a single post structure at Dead Man's Curve site (Alt 2010; Trader et al. 2025:28-32).

Redmond (1986) identified three site types in the Yankeetown settlement system: villages, hamlets, and camps. It is likely that the Yankeetown phase settlement at the Kreitzer Site is a series of ephemeral camps occupied for a short period. Camps were smaller and functioned as "…special purpose extractive sites…" where wild plants, animals, and raw materials were collected. Camps were found at floodplain, terrace, and upland settings and were occupied for short intervals from several days to months or would have been used seasonally over several years (Redmond 1990:65). The Yankeetown phase settlement at the Kreitzer Site falls within this category (Trader et al. 2025:28-33).

Evidence points that the Yankeetown phase at the Kreitzer Site fits the regional settlement and subsistence pattern noted for other Yankeetown phase sites in the region. The Yankeetown component is buried beneath 0.40 to 1.40 m of alluvium and represents multiple short-term occupations, particularly on stable landforms between 0.50 and 0.70 m and 1.20 and 1.50 m below surface (Trader et al. 2025:28-33).

CONCLUSIONS

G&P conducted data recovery efforts at the Kreitzer Site in 2023 and 2024 and identified a well-defined midden deposit with features and architectural remains relating to a Yankeetown phase and Angel phase occupation. This paper concentrated on the Yankeetown phase component at the site. The Yankeetown component was represented by 17 features, found scattered across the site area, but concentrate primarily at the western portion of the site. The Yankeetown phase at the Kreitzer Site dates primarily between AD 789 and 1200 and consists of two different occupations. The earliest occupation dates is AD 789 and falls within the beginning of the Yankeetown phase, while the later occupation dates between AD 1034 and 1220. The latter date overlaps within the Angel 1 phase (AD 1100 – 1200) and Angel 2 phase (AD 1200 – 1325) as defined by Hilgeman (2000).

While the faunal assemblage, comprised 37% of all cultural material from the Yankeetown phase, most of the animal bone consisted of small, unidentified, calcined fragments. The only identified species included white-tailed deer and beaver, suggesting that terrestrial and semi-aquatic mammal species were hunted.

The archaeobotanical assemblage was rather sparse and consisted of nutshell and nutmeat, wood charcoal, environmental seeds, two fragments of maize cupules/glumes, and squash rind. The archaeobotanical assemblage suggests that subsistence consisted of gathering nuts with some minimal evidence of cultivating corn and squash. Overall, the low plant food densities do not suggest that large scale harvesting and processing of nuts occurred; rather, they

indicate small-scale collections during short-term visits (Trader et al. 2025:20-31). Additionally, it is possible that all plant foods were brought on site in dried or parched condition.

Ceramics from Yankeetown feature contexts consist primarily of grog/grit tempered, plain jars or bowls. A few sherds are cordmarked; and a few rims exhibit dowel impressions with a scalloped appearance, or rims with a castellated appearance. Very few sherds exhibit any decorations other than punctations.

The lithic assemblage consists of both formal and informal tools manufactured primarily from gravel cherts or unidentified chert types. A few artifacts were manufactured from Wyandotte chert. Diagnostic flake types indicated that lithic reduction activities centered on the maintenance or bifacial tools. The ground/pecked/battered stone tools assemblage suggests that some type of limited nut processing occurred as well as some limited tool manufacturing.

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NEW PERSPECTIVES ON SMALL HISTORIC HOUSE SITES IN THE DANIEL BOONE NATIONAL FOREST: HISTORIC FOREST FARMING AND HOUSING STRATEGIES

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ABSTRACT

Research at Site 15CY23 provided a new perspective on small historic house sites and farming in the Redbird District of the Daniel Boone National Forest. Typically, these sites are rather ephemeral and found on small landforms amongst slopes that seem unsuitable for farming. Although farming and living at such places are often attributed to being a consequence of the residents' limited economic capabilities and marginalization, this study suggests differently. Archaeology, archival records, folk studies, and an analysis of soil chemistry indicate that these sites were short-term tenant occupations representing a purposeful housing strategy that suited traditional forest farming practices.

INTRODUCTION

Small historic house sites are found throughout the Daniel Boone National Forest often perched on narrow benches, ridge spurs, small toe slopes and drainage heads that appear to be unsuitable for farming. They usually consist of some surface remains, including stone chimney piles, pier stones, and cellar depressions. Deposits include a thin topsoil midden or plowzone with a small number of artifacts. Compared to their farmstead counterparts in the Bluegrass, these home sites are underwhelming and raise the question "why would anyone want to purposefully live and farm such a place?" One might think these sites are a consequence of stereotypical poor mountain folk who were relegated to marginal land (Collins 1975). However, research at a small historic house site (15CY23) in the Upper Red Bird River drainage led to a different perspective on these types of sites and what we can learn from them. In this article I compare artifact types and densities from the site to traditional farmstead sites in the forest, use soil chemical analysis to examine soil quality and house chronology, and integrate archival and folk studies information to argue that these small house sites are short-term farmsteads adapted to forest farming and economic strategies. I look at these sites not as a consequence of limited economic means, but

instead as a manifestation of a purposeful economic and housing strategy steeped in forest farming traditions.

PROJECT BACKGROUND

Site 15CY23 was first documented in 1981 by U.S. Forest Service archaeologist Gary Knudsen, who identified a chimney pile, foundation remnants, field clearing piles, a wash tub, and container glass from a single shovel probe all on a hillside near a drainage head of Lower DeZarn Branch (Figures 1 and 2). Although the site was in the most unlikely place for a home or farmstead, based on the presence of dark soil and surface features, the site was recommended for more investigation to determine its eligibility for listing on the National Register of Historic Places (NRHP; Knudsen 1981). Given the site's unorthodox location and dense vegetation, subsequent surveys were either unable to, or had difficulty, relocating it, thus no additional work had been conducted until a USFS timber sale in the Lower DeZarn Branch drainage was proposed.

Figure 1. South Chimney Pile and Bench Looking towards Lower DeZarn Branch.

Figure 2. North Chimney Pile Looking Across Lower DeZarn Branch toward the Midden Area and South Chimney Pile.

In 2023, the Kentucky Archaeological Survey conducted a Phase II investigation of Site 15CY36 to determine its eligibility for the NRHP. This work included the excavation of shovel probes and test units (Figure 3). The deposits identified at the site were limited, consisting of a rather thin topsoil midden isolated to a small bench landform and the hillslope below (Figures 1, 2, 3, and 4). The midden contained light to moderate number of artifacts and appeared to have been plowed or tilled.

During this work, another chimney pile was identified on a very narrow ridge spur across the drainage from the main part of the site. A few mid 1900s artifacts and limited deposits were found around this chimney pile which was situated on an exposed rock outcropping (Figures 2 and 3). Although the landform was quite limited, there appears to have been a house located there (Parrish et al. 2024).

In addition to the traditional forms of test excavations, a soil chemical study also was conducted at the suggestion of Redbird District archaeologist, David Breetzke. This analysis was conducted as an experiment to test this method for identifying activity areas within historic house sites. Despite the fact that many of these small house sites have been found, this project represents the first testing of such sites in the Redbird district (Parrish et al. 2024).

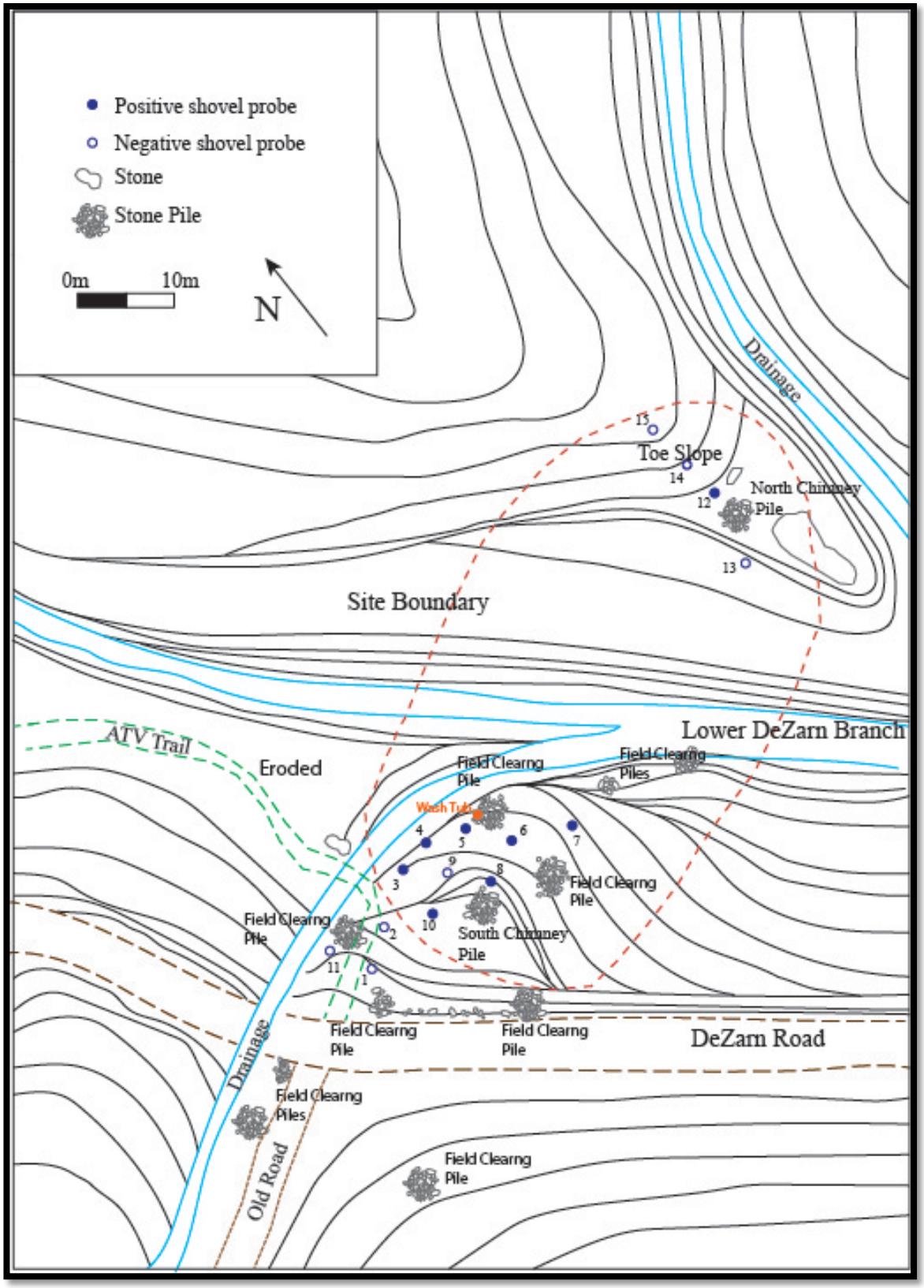

Figure 3. Site Map Showing the Location of Shovel Probes and Landscape Features.

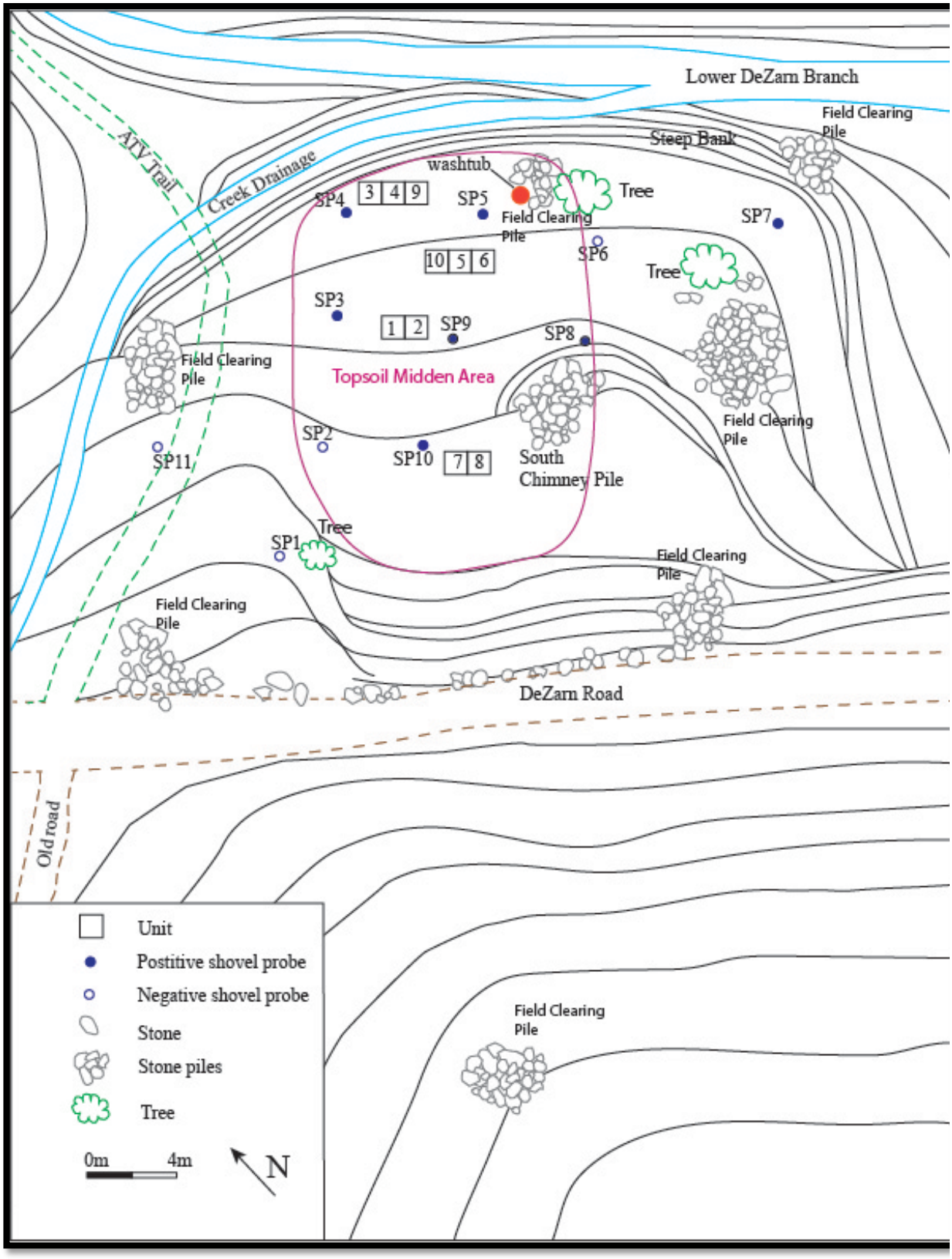

Figure 4. Site Map Showing the Location of the Topsoil Midden Area, Landscape Features, and Excavations.

DATA AND RESULTS

Archival

Archival research of historic sites in the Daniel Boone National Forest has its challenges when it comes to the availability of documents and maps. For some districts there is very little information about landowners and residents beyond the usual public documents which require a name to search. Unfortunately, it is often difficult to find the names of the people who owned and much less lived at sites. The Redbird District does offer some advantages over other districts in that much of the land was acquired by the Peabody Coal Company and later Henry Ford's Fordson Coal Company, who kept records regarding their land acquisitions and the tenants who occupied the land during the early 1900s. Detailed maps and correspondence between company officials and tenants who continued to live there into the mid-1900s are available for many of the tracts that now make up that part of the Daniel Boone National Forest. Despite these resources, it is still difficult to track transient tenants who typically lived at these small house sites. Such was the case for Site 15CY23. Although we had some names to work with, it took an examination of a variety of different resources from multiple angles in addition to the archaeology to develop a history of the site and how it articulates with area farming traditions.

One of the first European Americans to migrate to the upper Red Bird River was Dillion Blevins Asher who received a grant for 400 acres, which was surveyed in 1809 and patented in 1817. Although it is clear that the Asher family owned and/or lived on much of the land in the area, the tract containing Site 15CY23 was not officially patented until 1895, by Margaret Asher, daughter in-law of Dillion. As with much of the land in the area, it is likely that it had been periodically used and occupied by various families during the 1800s prior to the patent, but there are no official records of ownership. It was not until the late 1800s when there was interest in the area for its timber and coal resources did there become a need for clear title to the land. Such was the case with Site 15CY23. Just eight months after Margaret Asher received the patent for the property, she sold it to her son, A.J. Asher for $100.00 (Deed Book S:40).

Andrew Jackson Asher, better known as A.J. or Jack and his brother T.J., sought to capitalize on the vast timber and coal resources in Eastern Kentucky as the development of rail transportation made the extraction of these resources a profitable reality (Collins 1975; Bryan 1990). They owned several timber and lumber companies during the late 1800s before eventually turning their attention to coal and creating the Asher Coal Company (Rennick 2000). A.J. Asher speculated land in the Upper Red Bird River area for his and other companies. Asher used his family connections and various schemes to claim unpatented land and acquire family lands which he then sold to coal and timber interests (Deed Book 50:559; Queen 1928).

The lack of early patents for much of the land in the Upper Red Bird and the sudden interest in timber and coal resources during the late 1800s and into early 1900s created a rush to establish land ownership and facilitated numerous lawsuits over land claims. For example, the Peabody and later Fordson Coal Company found that they had purchased land which was claimed by others or did not have a clean title. Furthermore, Asher made efforts to establish possession of land that Fordson had already acquired from others by making improvements and leasing to tenants without the company's knowledge, prompting lawsuits (Queen 1928; Asher vs. Fordson Coal Company 1933, Kentucky Court of Appeals 61 S.W.2d 20). This action was just one of several schemes that Asher used to try and lay claim to lands acquired by Fordson.

According to the court case and letters, it is clear that both Asher and the coal companies were leasing property to local farmers who had likely been renting or just occupying unpatented land for many years prior to the Peabody and Fordson purchases. For example, leasers would build a small house or cabin of wood acquired from field clearing (Collett 1928; 1930). In 1930, Robert Sizemore wrote to Fordson engineer C.G. Queen asking to build a house and farm a plot the company owned on Lower DeZarn Branch. He offered to lease the house from the company he built in exchange for clearing and farming the land (Sizemore 1930). Queen responded by stating that "the old clearing on the land made many years ago now had a nice stand of poplar" on it, which Queen was concerned about losing. He, however, agreed that it was probable that they could allow Sizemore to build the house and clear a small garden plot provided that it did not take too many trees (Queen 1930).

It is not described in the letters where Sizemore intended to build his house or ultimately where Queen allowed him to build it. However, the 1890 Duffield property map shows a house labeled as "vacant" on Lower DeZarn Branch at Site 15CY23 (Figure 5). The 1920s Fordson property acquisition map shows a "house site" at the same location and another house further down Lower DeZarn Branch near its mouth at Red Bird River, labeled "Bob Sizemore" (Figure 6). These maps suggest that the old clearing that Queen was referring was at Site 15CY23. The Duffield and Fordson maps are on file at the Daniel Boone National Forest Redbird District Office.

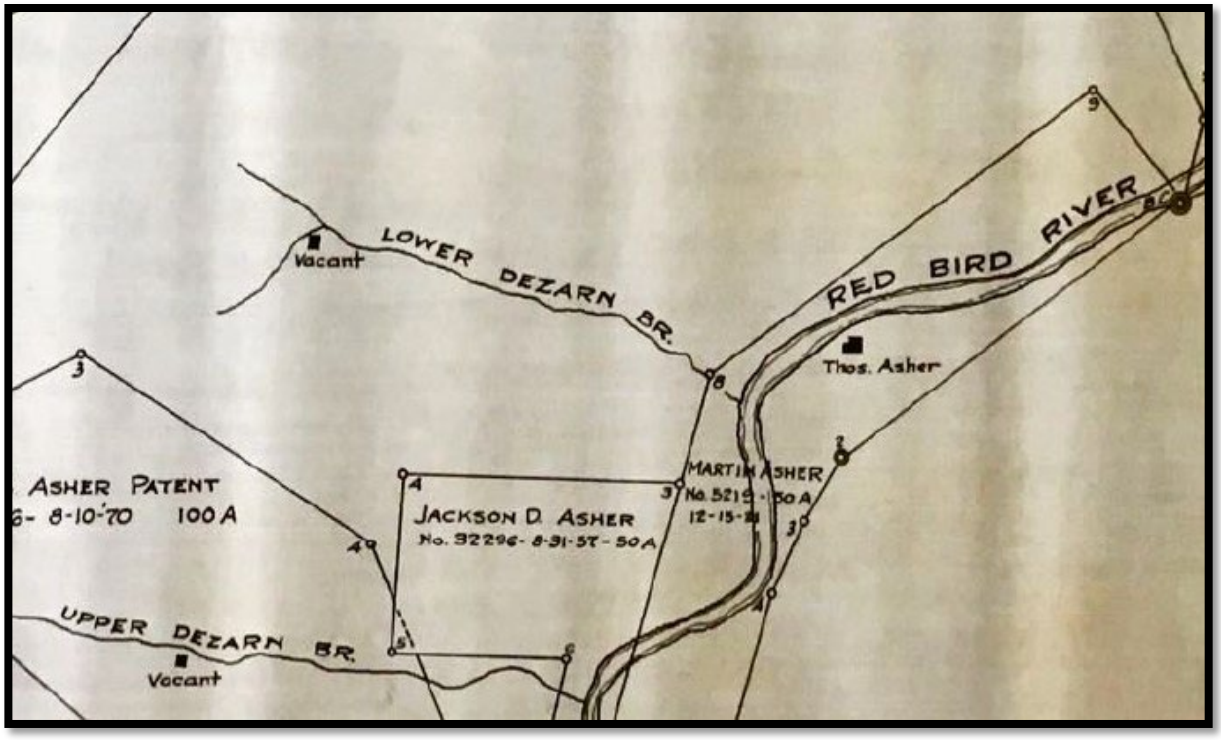

Figure 5. The 1890 Duffield Map Showing Lower DeZarn Branch.

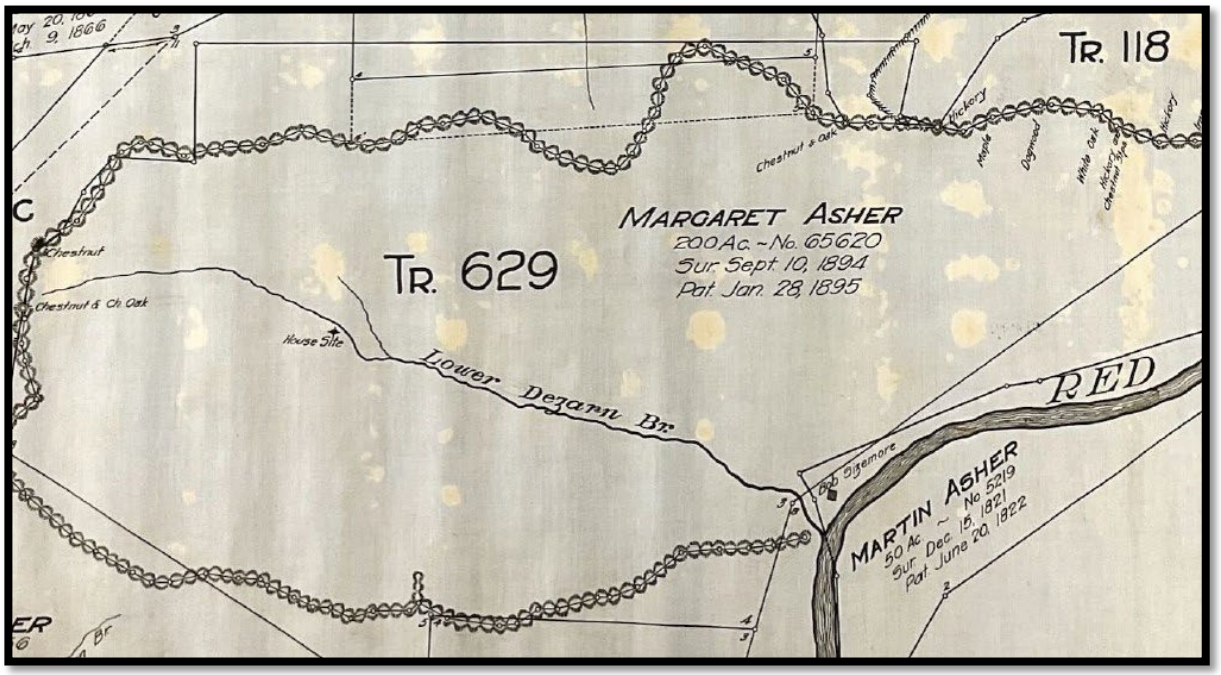

Figure 6. The 1920s Fordson Property Acquisition Map Showing Lower DeZarn Branch and the Margaret Asher Patent.

Robert Sizemore was born in 1883 to John "Little Creek" and Nancy Margaret Sizemore in Leslie County. His family was also among early European Americans to migrate to this area during the late 1700s and early 1800s. Sizemore married Martha Jane Estep in 1910 in Clay County. Although there is no record of a previous marriage, Robert Sizemore had two children prior to his marriage to Martha: a son and a daughter. He and Martha had seven children including six sons and a daughter.

According to the 1910 census, Robert lived in the Upper Red Bird River area of Clay County with his son and daughter on a farm he rented prior to his marriage to Martha. By the 1920 census, Robert and Martha were living with five of their children in the house near the confluence of Lower DeZarn Branch and the Red Bird River as shown on the Fordson map (Figure 6).

The 1930 census listed Robert and Martha with five of their children on a farm they rented. According to the 1940 census, Robert and Martha lived on a farm that they rented in the same area with three of their children. That year they paid $1.00 per month in rent for their farm and Sizemore earned $200.00. Based on the census records, Robert Sizemore and his family lived in the Lower DeZarn Branch drainage, at least during the 1920s to 1940 and perhaps earlier in the 1900s.

Soil Chemistry

Soil chemistry analysis has been conducted at historic period archaeological sites since the early 1970s. These early analyses were focused on identifying concentrations of organic matter, wood ash deposits, and soil associated with building materials (Ascher and Fairbanks 1971; Hurry and Kavanagh 1983). Other analyses have focused on interpreting architecture such as wall locations and the type of construction (Weymouth and Woods 1984; Stottman and Watts-Roy 2000). Soil chemistry also has been used in an attempt to identify activity and special use areas (Custer et al. 1986). The results of these studies had mixed success, as soil chemistry has largely been successful at identifying locations where architecture had been and certain types of deposits, such as fireplace cleanings, organic material, and middens. However, results have been less successful at identifying distinct activity areas, such as yard/garden, animal/food storage, waste disposal, and industrial areas. More recent uses of soil chemistry studies have deviated from earlier studies and focused on understanding the effect of particular chemical profiles on artifact and bone taphonomy (Wandruszka and Warner 2018, 2021).

A total of 30 soil samples were collected from various areas around Site 15CY23, including the topsoil midden area and north chimney pile (South House Area), the north chimney pile (North House Area), a flat area between two drainages (West Drainage Area), and control samples taken from among field clearing piles on the hill slope above the site (Control Area; Figure 7). Samples were collected from the soils below the forest duff and humic then placed in

a soil sample bag acquired from the University of Kentucky Soil Lab, who performed the soil analysis. The routine soil test offered by the lab measures levels of phosphorus, potassium, calcium, magnesium, zinc, and pH. The levels identified throughout the site were compared to optimal levels for growing agricultural crops to examine the viability of these areas for agriculture. The spatial distribution of test results was examined to identify concentrations of particular elements and pH levels at the site. All chemical (P, K, Ca, Mg, and Zn) levels are presented in lbs./acre.

Across the entire area sampled, pH levels ranged from 4.44 to 5.91 with an average of 5.03 (Table 1). The results indicate that the soil throughout the area is very acidic, as 7.0 is considered neutral. The levels of phosphorus were very low ranging from 0 to 125 lbs./acre with an average of 14.9, as levels generally optimal for agriculture are greater than 30 lbs./acre. Levels of potassium averaged 263.3 lbs./acre, which is within the 200-300 medium range for agriculture. Calcium levels were very high throughout the site, with the average of 2758.8 lbs./acre being more than four times the sufficient levels of greater than 400 to 600 lbs./acre for agriculture, however high levels of calcium do not have a negative effect on agriculture. Magnesium levels averaged 409.4 lbs./acre, which is within the medium 120 to 600 range for agriculture. The average zinc level of 17.0 lbs./acre was high, but considered sufficient for agriculture, which generally requires levels greater than 5 lbs./acre.

When the soil chemistry results are examined by area, some similarities and differences are noted in the chemical profiles. On average, all areas have low pH and phosphorus levels, rather high calcium and zinc levels, and moderate potassium and magnesium levels (Table 1). The Control Area's chemical profile appears to generally fit the optimal agricultural levels except for the low phosphorus and acidic soil. In fact, phosphorus was absent from all three samples taken in this area. The soil profile of the South House Area shows that both the phosphorus and pH levels are higher than the Control Area but are still well below optimal levels for agriculture. The West Drainage Area had much higher phosphorus levels than any other area with a level that is optimal for agriculture but also had a lower pH than the Control and South House areas, which was well below optimal for agriculture (Table 1). The North House Area exhibited a slightly higher phosphorus level than the Control Area but also had the lowest pH of all areas. Although three areas had higher average phosphorus levels than the Control Area, these levels were not consistent within each area. Each area had at least one sample that did not register any phosphorus, suggesting that soil chemical profiles were highly variable within individual areas. Regardless, The South House Area appears to generally have slightly better soil for agriculture than the other areas, but it is still not entirely optimal.

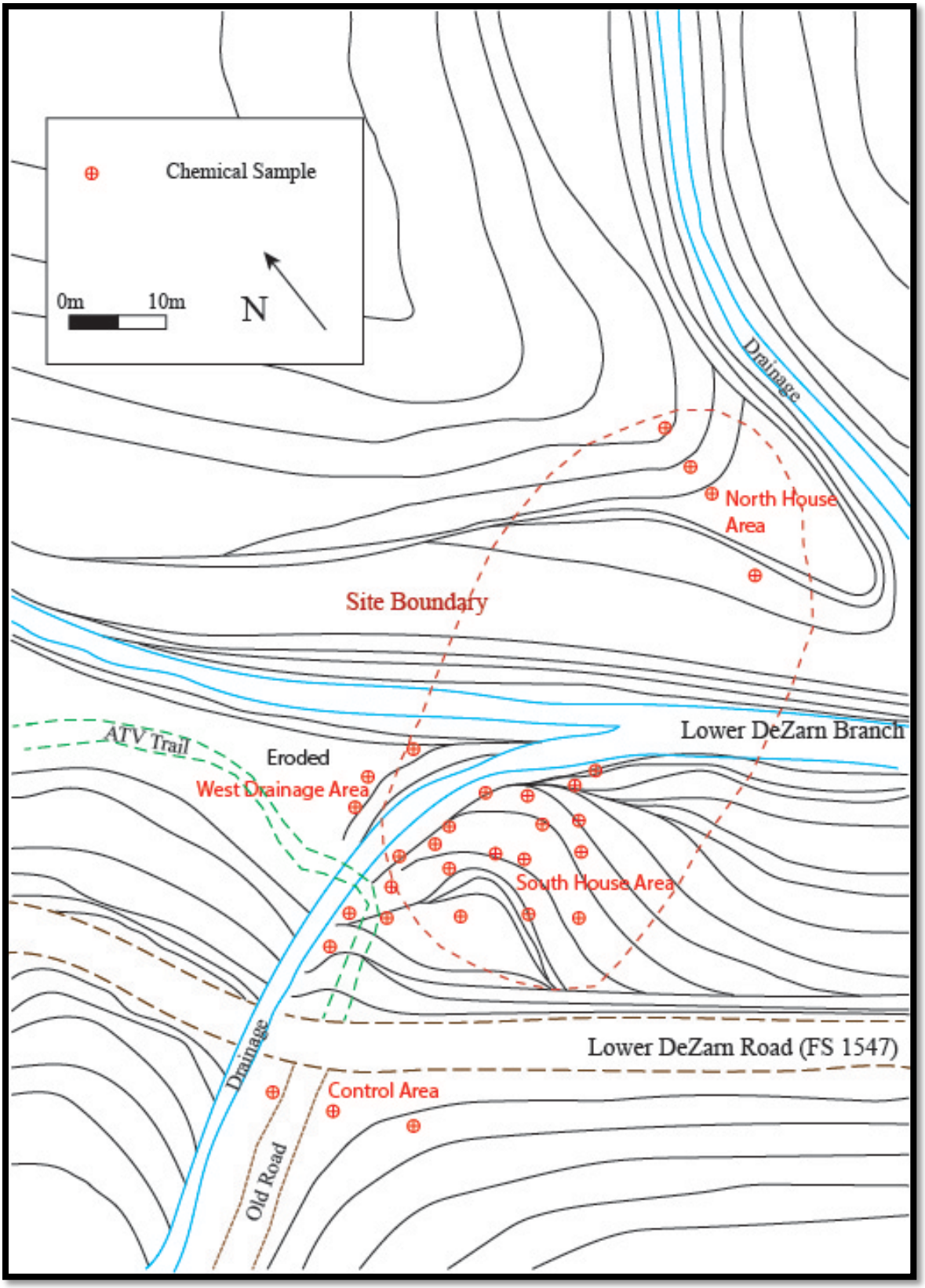

Figure 7. The Location of Chemical Samples from Site 15CY23.

Table 1. Soil Chemistry Results by Area at Site 15CY23.

Chemical	Control Area (n=3)		South House Area (n=20)		North House Area (n=4)		West Drainage Area (n=3)	
	Range	Avg.	Range	Avg.	Range	Avg.	Range	Avg.
pH	4.88-5.24	5.12	4.68-5.91	5.22	3.77-4.95	4.29	4.62-4.81	4.68
Phosphorus (P)	0	0	0-43	13.6	0-26	10.8	0-125	44.0
Potassium (K)	242-347	310	158-615	285.6	117-273	195.3	113-218	159.3
Calcium (Ca)	2058-2951	2494	1821-5230	3265.1	367-2234	1331.5	1252-2119	1551.0
Magnesium (Mg)	294-504	408	216-622	434.1	108-446	268.5	394-501	434.0
Zinc (Zn)	4.7 – 6.5	5.9	4.8 – 29.9	13.8	6.1-109	47.4	4.4 – 15.1	9.3
Levels of P, K, Ca, Mg, and Zn were measured in lbs./acre								

The main issue for the soils at Site 15CY23 for agriculture is the very low pH and phosphorus, despite the levels of other chemicals generally being within optimal range. The low pH inhibits the absorption of these other chemical nutrients which are present in the soil, leading to overall poor soil quality. The lack of phosphorus is also problematic for agriculture, as it is an essential nutrient for plant growth. Although all areas had sufficient levels of the other chemicals examined, there are some differences in concentrations.

Given the association of particular chemicals with activities or elements of historic period site structure, it is possible to identify some spatial distinctions (Custer et al. 1986). For instance, it would be expected that high levels or concentrations of phosphorus will be associated with animal pens, organic waste, or decayed food stuff. High levels or concentrations of potassium have largely been linked to the presence of wood ash and could indicate the location of hearths or ash disposal areas. High levels or concentrations of calcium and magnesium are largely indicative of structural remains, in particular masonry materials such as, mortar, chinking, and plaster (Ascher and Fairbanks 1971; Custer et al. 1986; Stottman and Watts-Roy 2000; Weymouth and Woods 1984).

The distribution of soil chemicals across Site 15CY23 shows some concentrations. Although calcium levels were generally high throughout the site, the highest levels were most concentrated in the South House Area (Table 1). Magnesium appears to be more widespread, but the highest levels were identified within the South House Area with a small concentration being identified in the North House Area (Table 1). This result coincides with what is likely the

location of houses based on chimney piles and an associated domestic midden associated with the South House Area. Although high levels of these chemicals can indicate the presence of brick and/or stone masonry, they also can be associated with frame or log structures, especially if chinking and plaster is used (Stottman and Watts-Roy 2000; Weymouth and Woods 1984).

The distribution of phosphorus, potassium and zinc are more distinct than the calcium and magnesium concentrations. Although the levels of phosphorus at the site are generally very low, when Phosphorus is present higher concentrations were found in just a few soil samples. One of these was located in the West Drainage Area which yielded the highest levels (Table 1; Figure 8). Given how isolated this concentration is, it is possible that its location was used for the disposal of organic waste or was the location of an animal pen. Because there was no other evidence of waste disposal in this area (i.e. artifacts) it seems less likely that it is associated with organic household waste.

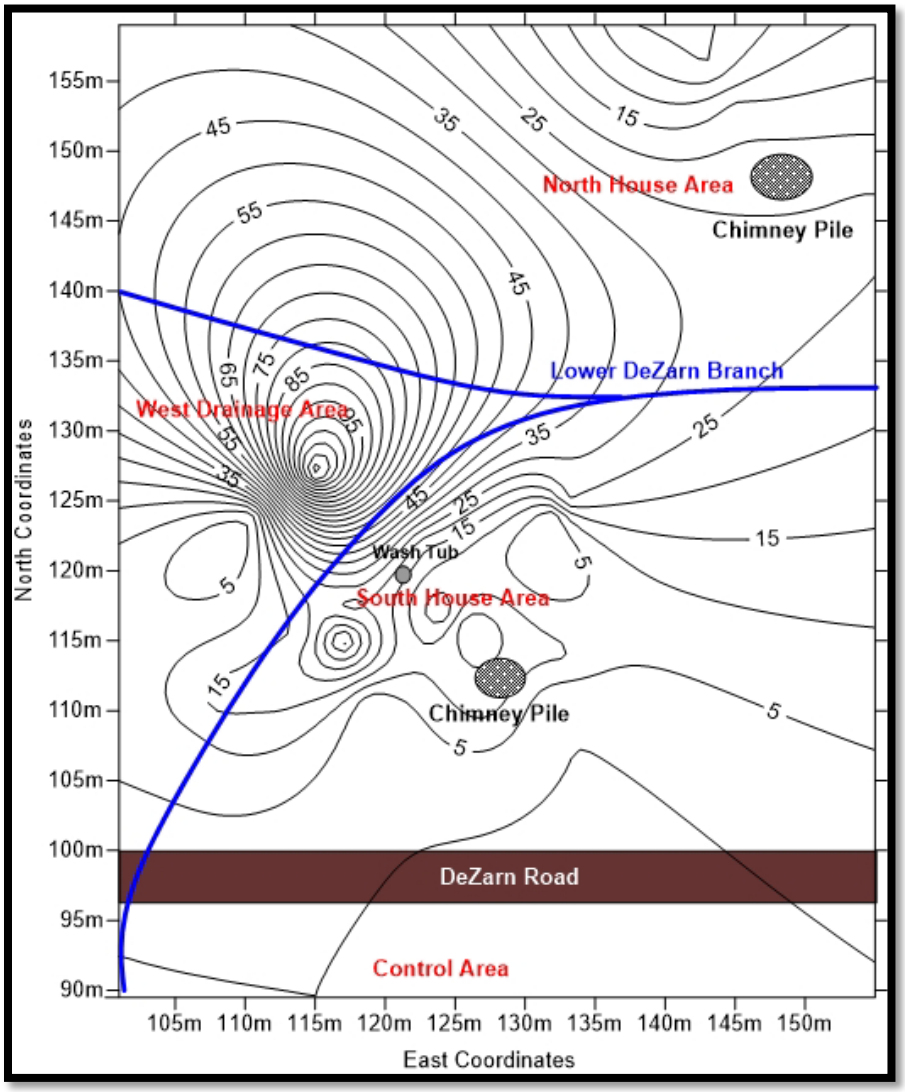

Figure 8. The Distribution of Phosphorus at Site 15CY23.

The potassium was largely concentrated in the South House Area near the chimney piles (Table 1; Figure 9). It could indicate there was a concentration of wood ash in the soil and would confirm the interpretation of the particular stone pile as related to a chimney. Interestingly, no potassium concentration was noted at the other chimney pile located in the North House Area, suggesting that wood ash had not accumulated there. There was, however, a concentration of zinc identified in this area associated with the chimney pile (Table 1; Figure 10).

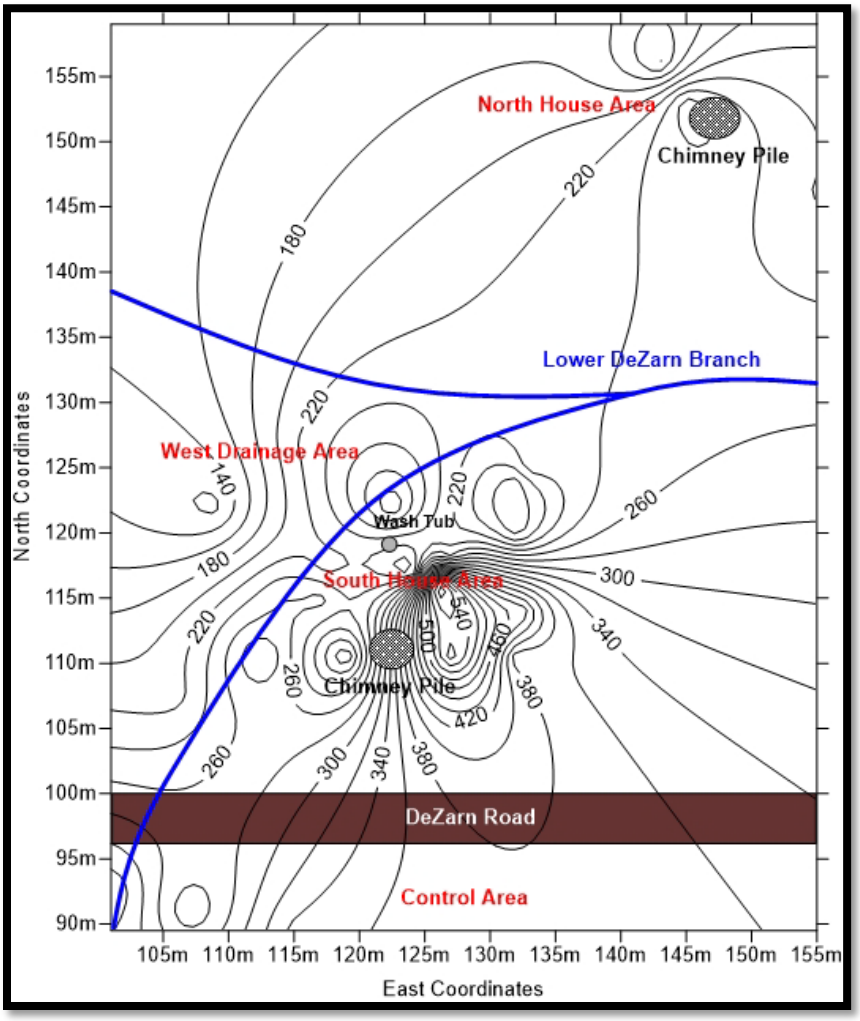

Figure 9. The Distribution of Potassium at Site 15CY23.

Zinc naturally occurs in soil at relatively lower levels and is a particularly important nutrient for growing corn. However, high levels of zinc are usually a result of anthropogenic processes originating from wastewater discharge or burning coal. It is likely that the latter has elevated the zinc levels around the chimney pile in the North House Area. The lack of potassium and presence of zinc at this location suggests that coal was the preferred fuel to burn in this fireplace, while wood was preferred at the fireplace in the South House Area. Although some coal and cinder

were found in the topsoil midden at the South House Area, it does not appear that coal burning was as prevalent in this area, as it was in the North House Area.

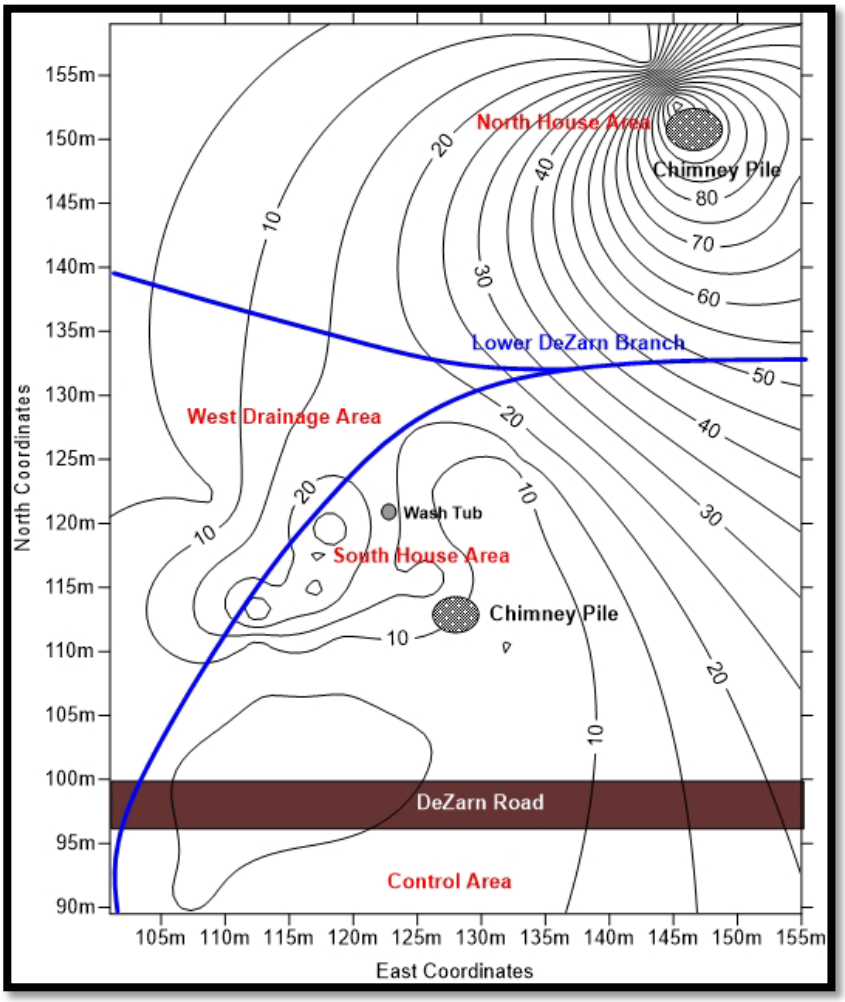

Figure 10. The Distribution of Zinc at Site 15Cy23.

The results of the soil chemistry analysis at Site 15CY23 indicate that the soil is not well-suited for agriculture, which also was likely the case in the past. The presence of the topsoil midden within the South House Area seems to be slightly better soil for agriculture, likely due to the disposal of household and organic waste associated with the occupation of a house there, thus it is not surprising that this area was eventually farmed. A concentration of phosphorus in the West Drainage Area may suggest that it could have been used as a small animal pen. Concentrations of potassium in the South House Area near the chimney pile seems to confirm that this particular stone pile was associated with a fireplace and chimney where wood was burned. The high concentration of zinc and lack of potassium concentrations in the North House Area in front of the chimney pile may indicate that coal was the preferred fuel for the fireplace

over wood, which helps establish a chronology for the houses suggesting that the North House is older than the South House.

Artifacts

Overall, the Site 15CY23 artifact assemblage was rather small consisting of just 405 historic period artifacts and two faunal remains. They generally date from the late 1800s to the mid-1900s. Diagnostic artifacts included undecorated, transfer printed, and decal whiteware and white granite ceramics; amber, amethyst, aqua, brown, clear, cobalt, milk glass, and possible uranium glass; machine-cut and wire nails; hard rubber; Bakelite plastic; and ceramic and glass maker's marks. The makers marks included a mark from the Homer Laughlin pottery dating from the 1930s to 1950s, country of origin marks from Japan dating from 1921 to 1945 (Figure 11), a glass "Castoria" patent medicine bottle dating from 1936 to 1940 (DeBolt 1994; Lockhart et al. 2014). That the artifacts were assigned primarily to the architecture and kitchen groups, shows that they are associated with a house known to have been located at the site.

Figure 11. Ceramics with Japan Country of Origin Mark and Homer Laughlin Maker's Mark.

Although the artifact assemblage was small, it could provide some insights to the site and those who lived there. The architecture artifacts were comprised almost entirely of nails,

consisting of machine-cut, wire, and unidentified types. Of these 29 were whole nails, with wire comprising the most (n=22), followed by machine-cut (n=4) and unidentified (n=3). These nails represented a variety of sizes ranging from 4d to 60d. Based on nail size functional categories, the whole machine-cut nails were likely used for roofing and siding (Young 1991). The unidentified whole nails were used for flooring and framing. Whole wire nails were represented in all four nail categories, likely being used for roofing, siding, flooring and framing. Although the whole nail assemblage is limited, it could suggest that the building/buildings constructed during the late 1800s may have been a log structure with a dirt floor given the absence of framing and flooring nails. However, the sample size is far too small to suggest definitively. Given that the nail assemblage consists of both machine-cut and wire nails, it is possible that a building constructed in the late 1800s was modified or repaired during the 1900s or that two buildings were present at the site during two different times (Adams 2002).

That only three pieces of window glass were recovered from the site is unusual for domestic sites that typically yield a significant amount of window glass. The paucity of window glass could indicate that the associated building/buildings had few windows.

Although most of the Site 15CY23 artifact assemblage was assigned to the kitchen group, it was still quite limited, it still can provide some insights into the occupants of the site. The ceramic assemblage was too small and limited to conduct an economic scaling index that can give a sense of occupant consumer capabilities and habits, since most vessels forms could not be identified (Miller 1980; 1991; Thomas 1988). This assemblage, however, can still provide a general idea of the occupant's economic conditions and consumer habits through a cursory examination of the indicators used in the indices, such as decorative types, and diversity of such types and vessel forms. Although the ceramics from Site 15CY23 were overwhelmingly undecorated, several decorative types popular in the late 1800s to mid-1900s are present, though in limited numbers. Transfer printed, decal, and several varieties of pattern molded decorations were identified (Figure 12.). Of the limited number of ceramic vessels identified almost all were plates or bowls, with one being part of cup. These ceramics suggest that the representative occupants were able to keep up with popular trends of the time by acquiring some new and more expensive ceramics on a limited basis. This consumer habit can also be seen in the presence of several examples of popular glass tablewares, such as colored glass fragments that were likely associated with depression, carnival, or uranium glass, and milk glass vessels. In general, however, the tableware and teaware used by site occupants was quite limited. This suggests that though there was a desire to keep up with the times there was little emphasis on or capability for tea or dining rituals. Such rituals were important for displaying wealth and refinement through the acquisition of tea and dish sets and the knowledge of proper etiquette in their use (Wall 1994, 1999).

Figure 12. Ceramic Decorative Types Recovered from 15CY23.

Other kitchen group artifacts, such as glass bottles and jars, were mainly used for storage. The presence of canning jar fragments and lid-liners is not unusual at farmstead and home sites of this period, and it appears that home canning took place at Site 15CY23. It is somewhat unusual that no ceramic storage or food preparation containers (redware, stoneware, or yellowware) were recovered from the site. These types of vessels were essential for food storage during this period, and their absence is noteworthy. It is possible that primary food storage took place elsewhere. Although the glass bottles could not be identified for the products they stored, most were machine-made clear glass, likely associated with bottled beverages and condiments that were widely available after the 1910s.

The presence of personal group artifacts is quite common at domestic sites and can provide some insight into occupant demographics and consumer habits. Several personal group artifacts, most of which date to the mid-1900s, were recovered from Site 15CY23, they included mostly clothing, such as buttons, grommets, and leather shoe parts. The buttons were made of hard rubber, Bakelite plastic, and aluminum. These types of buttons were common from the early to mid-1900s. They would have been used on the newest clothes of the time and suggest that occupants were trying to keep up with clothing trends. Also assigned to the personal group were fragments of a pocket watch plate, which represents an item that can be considered a luxury

depending on the style and make of the watch (Figure 13). On the other hand, pocket watches of all types were readily available and relatively inexpensive through mail order catalog. Pocket watch prices in the 1908 Sears and Roebuck catalog ranged from 59 cents for a basic watch to 32 dollars for a gold watch. It is unclear if the watch part recovered from Site 15CY23 was of the inexpensive or expensive variety.

Figure 13. An Internal Plate for a Pocket Watch.

Other personal group artifacts included a porcelain doll fragment and doll's teaware, which suggests that children were part of the household. More specifically, these children were likely female. The doll's teaware was printed with the country of origin dating the fragments to the mid-1900s. Dolls and doll's teaware were widely available at the time from mail order catalogs, costing less than 2 dollars for dolls and less than 1 dollar for a tea set. Toys like these may have been considered a luxury item for families. Also assigned to the personal group was a Castoria patent medicine bottle fragment that dates to the mid-1900s (Fike 1987; Lockhart et al. 2014). This artifact indicates that residents used some products for their health beyond home remedies. Such products would have been available at general stores, as well as mail order catalogs (Schlereth 1980).

DISCUSSION

Site 15CY23 Chronology and Its Residents

Based on the results of the archaeological investigations and archival research at Site 15CY23, we can get a better sense of the site's chronology and who lived there. The 1890 map indicates that a vacant house was present at the site at that time, from which we can infer that the house had been constructed, occupied, and abandoned prior to 1890 (Figure 5). The archaeological investigations recovered some artifacts that were manufactured exclusively in the late nineteenth century, such as machine-cut nails and undecorated and transfer printed whiteware. At that time, the house would have most likely been constructed of log and given that very little window glass was recovered from the site, probably had few or no windows. Such houses were common in the area at the time, as timber was plentiful, and it was a traditional type of house that had been used since the earliest white settlers came to the area in the early 1800s (Hudson 1995). The location of this house corresponds to the topsoil midden area identified at the site near the South House Area stone chimney pile.

Unfortunately, there is no record of who built and lived in this house during the late 1800s. Margaret Asher first patented the property after the house was abandoned in 1895, presumably on behalf of her son A.J. Asher, who was speculating land in the area at the time for sale to coal and timber companies. Margaret Asher lived in Pineville, Bell County at the time and clearly did not occupy her property. It is also unlikely that A.J. Asher lived on the property that he acquired from his mother just a few months after she patented it. Asher appears to have built and occupied cabins elsewhere in the area (Queen 1928). It is most likely that the house at Site 15CY23 was occupied by other members of the Asher family or the Sizemore family, many of whom were known to have lived in the area since the early 1800s. Given that the land was unpatented prior to 1895, it is not clear if these residents rented from a presumed owner or just occupied what was understood to be family lands.

The artifacts recovered from Site 15CY23 further suggest that the site also was occupied sometime between the 1920s and 1940s. This coincides with letters that indicate that Robert Sizemore built a house and lived at the site around 1930 (Sizemore 1930). It appears that Sizemore was living at the mouth of Lower DeZarn Branch along the Red Bird River in the late 1920s at the time he requested permission from Fordson Coal Company to build a house on Lower DeZarn Branch (Figure 6). Fordson's response indicates that there was an old farm at that location and that enough time had passed since its abandonment that the forest had grown back (Queen 1930). The 40 plus years between the abandonment of the original house at Site 15CY23 sometime before 1890 and Sizemore's request in 1930 fits with the archaeological evidence found at the site. Thus, it is likely that Robert Sizemore and his family lived at the site at least during the second occupation of the site in 1930. The presence of a doll part and doll tea ware is

consistent with this interpretation and the demographics of the Sizemore family which included a young daughter in addition to four older sons.

It is unclear if there were any remains of the original house (South House Area) left at the site when Sizemore arrived in 1930. It is possible that he renovated this house, salvaged it, or built a new one when he arrived. There was a substantial amount of wire nails recovered from the South House Area, suggesting that he either repaired the old existing house or built a new one. However, based on the presence of another stone chimney pile (North House Area) located across Lower DeZarn Branch, it appears that at some point another house was constructed at a different area of the site (Figure 4). This chimney pile had larger shaped stones that were not present in the chimney pile at the South House Area (Figure 2). It is possible that the stone was salvaged from the original house chimney and used to construct the chimney for a new house in the North House Area. Soil chemical analysis at both chimney piles indicates that wood was the primary fuel at the original house site while coal seemed to be burned at the new house site. Because coal would have been more common as a household fuel in the early 1900s than during the late 1800s in this region, it supports the interpretation that the North House Area was later. Based on this information it is likely that Sizemore probably salvaged what was left of the original house, renovated it or built a new one at that location in 1930. At some point later, Sizemore built another house across the branch on the small ridge spur.

Given Sizemore's arrival at the site in 1930, it is likely that the house or houses he constructed would have been of pole or box style frame construction. Fordson received several letters during this period requesting to construct houses and lease land, including from Robert Collett who claimed that the construction of Carlo Sizemore's store "is crowding him out" and asked for permission to construct a "pole house" across the creek and that he intended to also "build me a house over at the mouth of that little hollow across Red Bird Orchard Hollow. I am going to build me a boxed house, it will cost me a small sum." He also asked Fordson engineer C. G. Queen for assistance with the saw bill for the box house (Collett 1930). Collett's letter is a good indication of the type of housing that residents were constructing in the area during that time.

The fact that box houses were being constructed is not unexpected as it became the prevalent type of housing throughout the Appalachian Mountains during the early twentieth century. Karen Hudson (1995) compiled and synthesized a number of sources on house types used throughout the Eastern Kentucky mountains and found that the common stereotype of one-room windowless log cabins to be misleading. Although such log cabins were common in the early to late nineteenth century and were still being used to a lesser extent at the turn of the century, with the increase in the timber industry and sawmills in the region, local peoples quickly adopted box houses as they were relatively inexpensive to build and could be constructed quickly. Box houses were constructed primarily of vertical or horizontal planks attached to a sill and top plate with minimal framing and covered with weatherboard siding or battens (Martin 1984; Hudson 1995; Morgan 1990; Williams 1990). They often use a masonry foundation or piers but also could have no foundation at all. They often had windows, plaster or papered walls, and

they usually had two to four small rooms (Hudson 1995). Although box houses have been studied extensively, there is little information on pole houses. However, they seem to be a version of a box or frame house construction that did not use a foundation, instead poles were buried in the ground and serve as the main framing members to which other framing and siding is attached. The range of wire nail sizes recovered from the South House Area (original house) at Site 15CY23 could be indicative of either a pole or box house. However, the presence of both machine-cut and wire nails at that location suggests that perhaps the original house was repaired or modified by adding a box frame addition, also a common practice in Eastern Kentucky (Hudson 1995).

Although few artifacts were recovered from the shovel probes excavated at the North House Area, it also was probably a box house given the time period and context. It does not appear that this house was used for very long since the topsoil in that area was not well developed, and few artifacts were found there. It is possible that the Sizemore dismantled the house and moved it to a new location, perhaps elsewhere along Lower DeZarn Branch.

The soil chemistry analysis identified a concentration of phosphorous on a small flat area at the confluence of a drainage and Lower DeZarn Branch which could have been the location of an animal pen. However, without more architectural remains, it is difficult to discern the layout of the farm, such as outbuildings, other than the house locations.

The presence of numerous stone piles associated with field clearing at the site indicate that the narrow bottom area along the streams and the hillside that extended up along the drainage south from the branch up to the ridgetop had been cultivated. The 1954 USGS topographic map shows this area as being open at that time and likely represents the remains of a cleared farm field (Figure 14). Because many of the field clearing stone piles are located directly around the original house site and the presence of plowzone, it is clear that this area had been farmed after the new house had been built in the North House Area. Unfortunately, cultivation of this area had disturbed the deposits associated with the original and subsequent 1930 occupations, mixing the associated artifacts. However, the fact that the old house site in the South House Area had been plowed could suggest that Sizemore built the new house across the drainage to open this area for cultivation, which the chemical analysis indicates had better soil.

Based on the archival and archaeological information, it is likely that at least the 1930s occupation of the site is associated with Robert Sizemore and his family. The earlier occupation may have been associated with other members of the Sizemore or the Asher families. Regardless of the occupants, it does not appear that Site 15CY23 was occupied by anyone who owned the property, instead being leased or just unofficially occupied for short periods of time. A profile of these occupants and the Sizemore family can be constructed and compared to other sites of the same period that have been excavated in the Daniel Boone National Forest.

According to the 1940 census, Robert Sizemore and his family were much like other families who lived in the Upper Red Bird River area. Most rented their homes and farms and were employed in farming, although some worked in timber and coal. Rent typically ranged from $.50

to $1.00 per month and most reported no income. Of those who did report income, it ranged from $50.00 to $300.00 per year. Reported incomes for people who owned their houses and farms were not much different than those who rented with many reporting no incomes and for those who did, it ranged from $50.00 to $450.00. It is likely that many people just declined to report their incomes to the census. The value of the homes that people owned ranged from $90.00 to $800.00, suggesting that people owned a range of house types, such as the previously mentioned box or pole house to more expensive two-story Victorian or Craftsman frame houses, which have been documented in the mountains (Wood 1930; Hudson 1995). Based on this small sample from the census, it appears that the wealth of people who owned was largely tied to their property and not necessarily their income and those who rented often had similar incomes. For example, Robert Sizemore paid $1.00 per month in rent and reported an income of $200.00 in 1939.

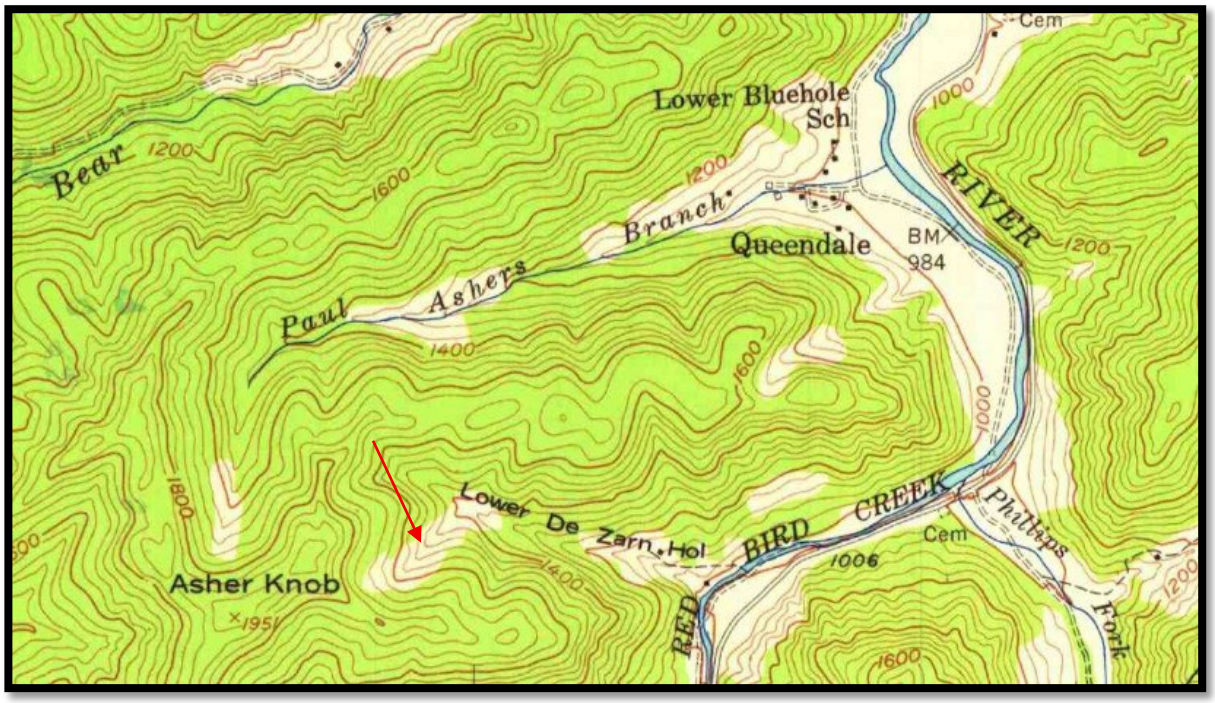

Figure 14. 1954 USGS Topographic Map (Creekville Quad) Showing the Clearing for Site 15CY23 and Other Clearings.

Although the artifact assemblage recovered from Site 15CY23 was quite limited, it is possible to get the sense that the Sizemore family was not wealthy, which is evident in their documented economic capabilities, however they seemed to have more income than most of their contemporaries and as much as some property owners. The presence of, though limited, decorated ceramics, glass tableware, and personal items suggests that they had access to contemporary goods and tried to keep up with current trends. Although the rather small artifact assemblage could be interpreted as conforming to traditional perceptions of poverty in the

region because of geographical isolation and limited economic resources, this is probably not the case.

Comparison to Other Forest Farmsteads

Archaeological investigations at farmstead sites in the Daniel Boone National Forest have shown that traditional perceptions of the people in the region being isolated and poor were not reflected in their material culture (Huser 1993; Hudson 1995; McBride 1994; 2018). For example, the work at the Jewell site (15Mf372) and Elkins site (15Mf373) on Indian Creek in the Red River Gorge of the Daniel Boone National Forest provides a useful comparison to Site 15CY23 (McBride 2018). The residents at these two sites, the Jewell family and the Elkins family, owned their properties (Jewell 1877 to 1930s; Elkins 1910 to 1940s). In the 1880s, the Jewell family had a large and productive farm according to census records, however by the early 1900s they farmed much smaller and less productive acreages, like the Elkins family did. Given that these sites were located in a fairly broad creek bottom, the value of their property was higher than that seen for people living in the Upper Red Bird River area, however their reported income was similar being relatively low. Economic scaling analysis conducted on the ceramics from the Jewell and Elkins sites show that both families had lower middle class purchasing power and that they had access to and were able to acquire a variety of contemporary ceramics such as molded, decal, and transfer printed wares. Although such an analysis could not be performed on the Site 15CY23 assemblage, it exhibited a similar presence of contemporary wares.

In general, the make-up of all three assemblages was similar, with respect to the types of ceramics and the presence of glass tablewares, some patent medicines, personal artifacts, and the relative lack of faunal remains. Faunal remains are typically found in large numbers at historic domestic sites, however just 40 were recovered from Jewell, three from Elkins, and two from Site 15CY23. It is unclear as to why there are few faunal remains at these sites, but it likely has to do with disposal practices off site or perhaps repurposing such remains.

There were some distinct differences noted between Jewell/Elkins and Site 15CY23 in the amount of window glass, utilitarian ceramics, and overall amounts of artifacts. Both the Jewell and Elkins houses were thought to be box houses with windows, as is common with these types of houses and there was a significant presence of window glass from the sites. The box house at the Jewell site was constructed in 1897, and it is not known what type of house had been at the site before, but it was likely of log construction (McBride 2018). As previously mentioned, only three window glass fragments were recovered from Site 15CY23, which suggests that no or few glazed windows were associated with the original house location and likely adds to the evidence that a log structure was initially constructed there.

That no coarse ceramics, such as stoneware crocks, jugs, bowls, or jars were recovered from Site 15CY23 is unusual. These types of ceramics are typically found at all historic house sites, especially farms. Both Jewell and Elkins sites yielded significant amounts of coarse ceramics, consisting almost exclusively of stoneware. It is unclear as to why no coarse ceramics were recovered from Site 15CY23, as previously suggested, it is possible that food storage was exclusively done using glass jars or that such activities did not take place at the house and instead were performed at another location.

Perhaps the most distinct difference between the sites is the number and relative density of artifacts recovered from each site. There were far more artifacts were recovered from the Indian Creek sites (4,973 from Jewell and 1,600 from Elkins) than at Site 15CY23 (n=405). This disparity is largely due to the fact that twice the amount of area was excavated at these sites compared to Site 15CY23. However, when we look at the number of artifacts per meter, we can see that it was much lower at Site 15CY23. The average artifact density was 154.2 artifacts per meter at Jewell, 94.9 artifacts per meter at Elkins, and just 35.0 artifacts per meter at Site 15CY23. While an explanation for the small assemblages and low artifact densities in general could be that these sites were geographically isolated and the associated residents economically challenged, it does not seem to be the case. It is more likely that length of occupation is the primary factor. The Jewell site had the longest occupation lasting for around 40 years for the house built in 1897 but could be as long as 70 years if the original house on the property was at the same location. The occupation at the Elkins site lasted for around 20 years. The difference in total artifact count and density between these two sites is likely a result of the difference and the duration of occupation. The fact that the artifact count and density at Site 15CY23 is much lower, suggests that it had much shorter-term occupations, perhaps ten years or less for each occupation, which is consistent with the archival data. Thus, artifact densities at these types of sites are likely a result of occupation duration and not necessarily limited access to goods.

There is also one other major difference between the Indian Creek sites and Site 15CY23 that also must be considered. The Indian Creek sites and most historic farmstead sites in the Daniel Boone National Forest tend to be located in valleys on creek or river bottoms which afforded the best and most fertile farmland. The floodplain environment, regardless of size, usually provided the best soils which were regenerated with nutrients through frequent flooding. It is no surprise that land ownership and farm development was focused on this environment. However, sites like Site 15CY23 were not located in bottomlands, but were instead on benches, ridge spurs or drainage heads. This location for a farm prompts us to ask why this sloped environment was rented for farming by the Sizemore family and why did they move from a farm they rented in the floodplain during the 1920s? The most obvious answer to these questions is derived from the limited economic capabilities of the people in the Upper Red Bird River area and the misperceptions that accompany them. To address these questions, we must first get a better understanding of farming practices in the Eastern Kentucky forested mountain environment and recognize that traditional concepts of farming may not apply.

Forest Farming Traditions and Tenancy

Farming on the Kentucky Cumberland Plateau of Southern Appalachia in the early twentieth century was challenged by steep terrain, unseasonable frosts, poor soil, and limited transportation. Because of these challenges, many mountain farmers practiced subsistence agriculture based on corn cropping and forest fallowing. Corn was the preferred crop because it was a native crop that could be grown at little expense in poor soils, offered reliable yields without fertilization, and could feed the farmer's family and livestock (Otto 1983). It could also be easily made into products, such as whiskey, an easily transportable and saleable product. Farmers typically focused on planting corn in the valleys and floodplains where soil was rich and could be farmed repeatedly for many years. However, the narrow valleys and bottoms on the Cumberland Plateau limited farm acreage and many farmers had to also cultivate less fertile hillsides and narrow ridges (Otto 1983). These conditions led to farmers adopting land rotation and forest fallowing strategies. Farm owners in the region typically cultivated less than 20 percent of their property at a time, while 60 to 75 percent was woodlands and the remainder was fallowed fields (Davis 1924; Otto 1983).

Because most of the farm property in the region was sloped, soil was highly eroded leading to thin poor-quality soils, as nutrients were locked up in the living vegetation, such as trees and undergrowth. To utilize the hillslopes and ridges for cultivation farmers needed to clear the land and unlock the nutrients, which was accomplished through a form of slash and burn farming (Otto 1983). Farmers would clear small fields by burning the undergrowth and girdling trees, which consisted of removing bark to stop the flow of sap in the trees making them easier to remove later. Ash from the burned vegetation would release the nutrients back into the soil, in particular it helped increase soil pH, calcium, and potassium. The resulting fields could be cultivated for several years before they would be abandoned for new fields and left to fallow. The old field would be used as rough pasture for livestock as brush grew and woodland was reestablished starting the cycle over. It typically took at least 20 years for a former field to revert to woodland, thus farmers constantly rotated their small plots of farmland on a decades long cycle (Hart 1977; Otto 1983).

Evidence of forest fallowing in the Upper Red Bird River area during the 1920s can be seen on the Fordson map. The map shows the Wilie Hibbard property along the upper Asher's Branch just over the ridge from Lower DeZarn Branch with labeled small plots of cleared land under cultivation and formerly cultivated plots in secondary growth with grass and bushes (Figure 15). This map clearly shows land rotation with active farming plots and former farming plots being fallowed. Robert Sizemore's letter to Fordson also seems to describe forest fallowing, as the reference to an old clearing that had been reforested and then being the location where Sizemore wanted to build his house. Soil chemistry analysis of Site 15CY23 shows that the control samples away from the house areas indicated that Sizemore's cultivated field had adequate levels of most soil nutrients, except for phosphorus which was extremely low. Also, the soil pH was very low

which limited the plant's ability to absorb the nutrients. In general, the soil today would be considered poor for farming. Given that it has been at least 70 years since the site was last farmed this result is not surprising. Clearing and burning of the area would certainly improve the soil quality for farming, as it did historically, but it would have been temporary. That the area where the original house had been located (topsoil midden area) was farmed speaks to Sizemore's recognition that the soil there was better quality for cultivation, as was demonstrated by the soil chemistry analysis.

Based on this information it appears that the above-described land rotation and fallow system was being practiced in the Upper Red Bird River area. However, discussion about the forest fallow system is usually in reference to farmer-owned property not rented farms. It was noted that this system required a large amount of land for individual farmers to rotate land for cultivation over the long period of time needed to complete the cycle (Otto 1983). Although there were some land-owning farmers in the Upper Red Bird River area, most rented their farms in the early 1900s, thus how did farmers who rented their farms utilize forest fallow strategies? If we reconceptualize tenancy as a necessity for the economically challenged and instead view it as an economic strategy consistent with land use and farming traditions, then it becomes a sensible approach to farming.

Our traditional perception of renting is based on one's limited economic capabilities. For instance, people who rent are relegated to being landless because they can't afford to buy land, thus there are negative stereotypes attached to tenancy. However, this may not have been the case in the past where renting was practiced by people of all economic capabilities and did not have the negative perceptions it does today. This idea of renting being a positive economic strategy was seen in nineteenth century urban Louisville where upper middle-class families rented the houses where they lived. It was found that they could make more money renting the houses they owned to others and renting the house in which they lived from someone else (Stottman 2016). When viewed in this way, the idea of renting takes on a different connotation. It is likely that renting farms in the Upper Red Bird was perhaps less an economic necessity and more a purposeful strategy.

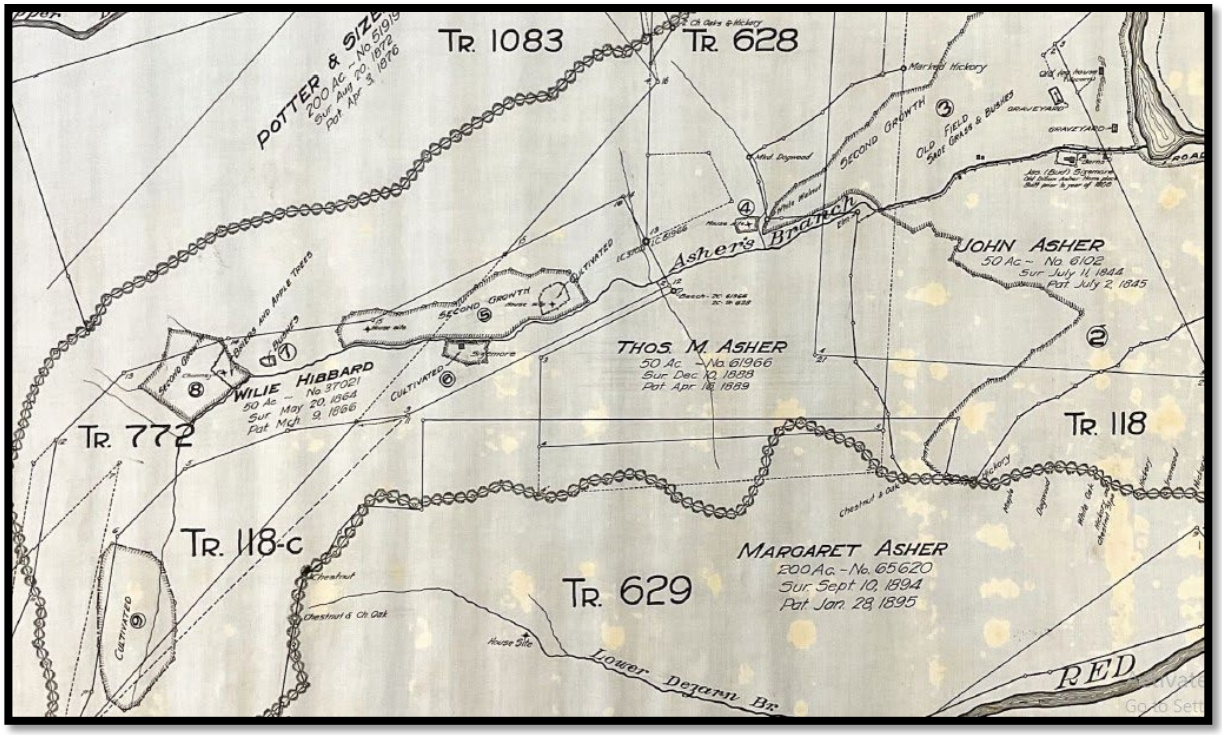

Figure 15. Fordson Map Showing Cultivated and Fallowed Fields.

To examine farm renting in the Upper Red Bird we need to first understand the history of land ownership. As previously discussed, during the nineteenth century there were a number of land patents filed typically in 50-, 100-, or 200-acre parcels and there were large areas of land that had not been patented. This system of land ownership was not conducive to forest fallow farming as parcels were generally too small. This is evident on the Fordson map showing Wilie Hibbard's 50-acre farm and his cultivated field and fallowing fields extending beyond his patent boundaries. The fact that the 200-acre parcel containing Site 15CY23 was not patented until 1895, despite there being evidence that a house had been built on the property before that date indicates that occupying and farming land that was not yours or was not patented may have been common practice as forest fallow farming required frequent moves to clear new fields. Because most of the landowners in the area were often part of the same family, it was likely permissible to move about the area more freely developing new fields with little concern for property boundaries.

By the time that timber and coal companies took an interest in the area and began buying up land, a system of farming based in forest fallowing where property boundaries were perhaps not as important among family had been established. As outside interests acquired land, those who formerly owned the land or those family members who occupied unpatented land began renting farms. Since most landowners were no longer family and there was no longer unpatented land, farmers of the Upper Red Bird River had to adapt to their new situation. It is likely that

farmers found that renting rather than owning was more conducive to maintaining their traditional way of farming. If a farm owner did not own a large parcel of land or good bottomland, then they were limited in their ability to practice forest fallowing. Renting farms through short-term leases allowed farmers to frequently move their farms and clear new fields, continuing forest fallowing traditions.

Based on letters between lessees and Fordson, it appears that a mutually beneficial relationship between the two was developed. Robert Sizemore and his request to build a house at Site 15CY23 is a good example of this relationship. Robert Sizemore had been leasing a house along the Red Bird River near Lower DeZarn Branch prior to his request to build a house at the site, land which according to Fordson had been previously cleared and reforested. According to the letters, Fordson would lease land and sometimes provide materials to the leasers for building houses. Although Fordson may lose some timber from clearing small fields, they gained a house at little expense that can be rented. The exchange between Sizemore and Fordson seems to indicate this arrangement and his commitment to forest fallow farming. Because it appears in the letter that Sizemore was returning to a previously farmed area, it is possible that he was returning to a field that was farmed perhaps by other members of his family some 40 years prior. Under the conditions of land ownership in the early 1900s, renting was more likely a better economic strategy for local farmers. As such, rented farms were likely occupied for a short term before the farmer would move on to another location to build another house and clear another field. Since farmers in the area were primarily building box houses, it would have been relatively easy to construct these types of houses quickly and inexpensively.

CONCLUSIONS

Archaeological and archival data indicates that Site 15CY23 was occupied by Robert Sizemore and his family around 1930, where he built a new or rebuilt an existing house. At that time, Sizemore rented the land and house from the Fordson Coal Company. The location of this house is represented by the South House stone chimney pile and a topsoil midden that yielded most of the artifacts from the site. That most of the artifacts were found on the slope between the South House chimney pile and Lower DeZarn Branch, suggests that many of these artifacts were washed downslope during different plowing episodes.

Sometime after he moved to the site, Robert Sizemore built another house. This house is represented by the North House stone chimney pile that is located on a small toe slope across Lower DeZarn Branch and northeast of the initial house. It appears that the stone for the chimney of North House had been salvaged from the chimney of the original house location (South House). Perhaps the new house (North House) was built in order to cultivate the land at the original house (South House) location. The North House was probably not occupied very long as there was little development of a topsoil midden there. Sizemore and his family appear to have lived at Site

15CY23 for about ten years before moving to another location further down Lower DeZarn Branch.

Soil chemistry analysis at the site failed to identify specific activity areas but possibly indicated the location of an animal pen area just outside of the topsoil midden area. Furthermore, it seems to indicate that coal may have been the primary fuel used for the fireplace at the North House, while wood was used at the South House. This analysis did identify that the overall soil quality at the site was very poor, with very low pH and phosphorus levels.

These results speak to the well-known issues associated with mountain farming on the highly eroded slopes and ridges of the Cumberland Plateau. Farmers in the region practiced a slash and burn type of farming and forest fallowing on this topography. This system of farming required frequent land rotation and long-term fallowing that often took decades to complete. The archaeological testing at Site 15CY23 examines an example of this farming tradition and sheds some light on adaptive strategies to maintain it. It is likely that the prevalence of renting during the early to mid-1900s in this region was a strategy that local farmers used to continue their mountain farming traditions after most of the land in the region had been acquired by timber and coal companies. This idea dispels the myth that renting was only a consequence of limited economic capabilities and instead was a purposeful economic strategy. Furthermore, this project questions the usual interpretation of low artifact counts and densities at forest farmstead sites as being caused by geographical isolation and limited economic capabilities. Instead, this trend is likely a result of short-term occupations at sites that are characteristic of forest farming practices for those who rented land.

Although 15CY23 was determined not to be eligible for listing on the NRHP due to that the research potential of the site had been exhausted during the Phase II, a lack of intact stratified deposits, and paucity of artifacts, the testing project provided a better understanding of these sites and offered a new perspective on how they can be interpreted. It is expected that additional testing at such sites with more intact deposits and good archival resources could further advance our understanding of these unorthodox house and farm sites.

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INITIAL RECORDINGS OF CLANDESTINE DISTILLATION SITES AT LANDS BETWEEN THE LAKES

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ABSTRACT

This paper presents the first systematic archaeological investigation of clandestine distillation sites in the Land Between the Lakes (LBL) National Recreation Area, a region long associated with illicit whiskey production. Building on a rediscovered Tennessee Valley Authority (TVA) map documenting more than 80 suspected moonshine sites, archaeologists used GIS, metal detection, and leaf-blower-assisted surface clearing to identify and record physical evidence of a mid-20th century distillation site. The case study of site 15TR568 reveals intact features of a Casey Jones style square still, a fermentation barrel, woven wire fencing used for insulation and concealment, and associated artifacts such as glass jugs, ceramic sherds, and steel hoops of wooden barrels. Artifact analysis places the site's occupation between 1948 and 1964, when federal land acquisition and increased access heightened risks for moonshiners. Comparisons with regional studies situate LBL within broader Southeastern traditions of clandestine distillation in the U.S., while highlighting unique technological innovations, strategies of concealment, and the cultural heritage of whiskey-making in this community. These findings establish a methodological framework for recording additional sites at LBL and contribute to the growing archaeological literature on moonshining as both an illicit industry and a significant part of local heritage.

INTRODUCTION

Beginning in the 1960s at the Land Between the Lakes (LBL) National Recreation Area, the Tennessee Valley Authority (TVA) started to keep informal records of what appeared to be clandestine distillation sites in the various work-areas for timber and other projects. The remnants they encountered included dugout pits, vats, hoops from barrels, jugs, cans and even the cookers.

This informal record included a map with encircled numbers and a small tick mark connecting the label to a point on the map (Figure 1). The labeling convention used was the work area number followed by a dash and then a sequential number unique to the individual site. In nearly each case, the site indicated was close to a natural spring or a stream—often a confluence of streams. Accompanying this map was a hand-written list of the sites in numbered order with a very brief description of what was observed (Figure 2).

The first version of this map encountered by the USDA Forest Service Heritage team at LBL was two pages stapled together—both photocopies of sections of the original papers. This was found in a drawer of historic documents and photographs but didn't explicitly show itself to be a map of moonshine sites and only three or four sites were represented. Several months later, the original, full version of this TVA annotated moonshine map was accidentally located by a Forest Service employee cleaning out a desk. This map version has at least 88 moonshine sites listed by work area.

Figure 28 TVA map with labeled still locations.

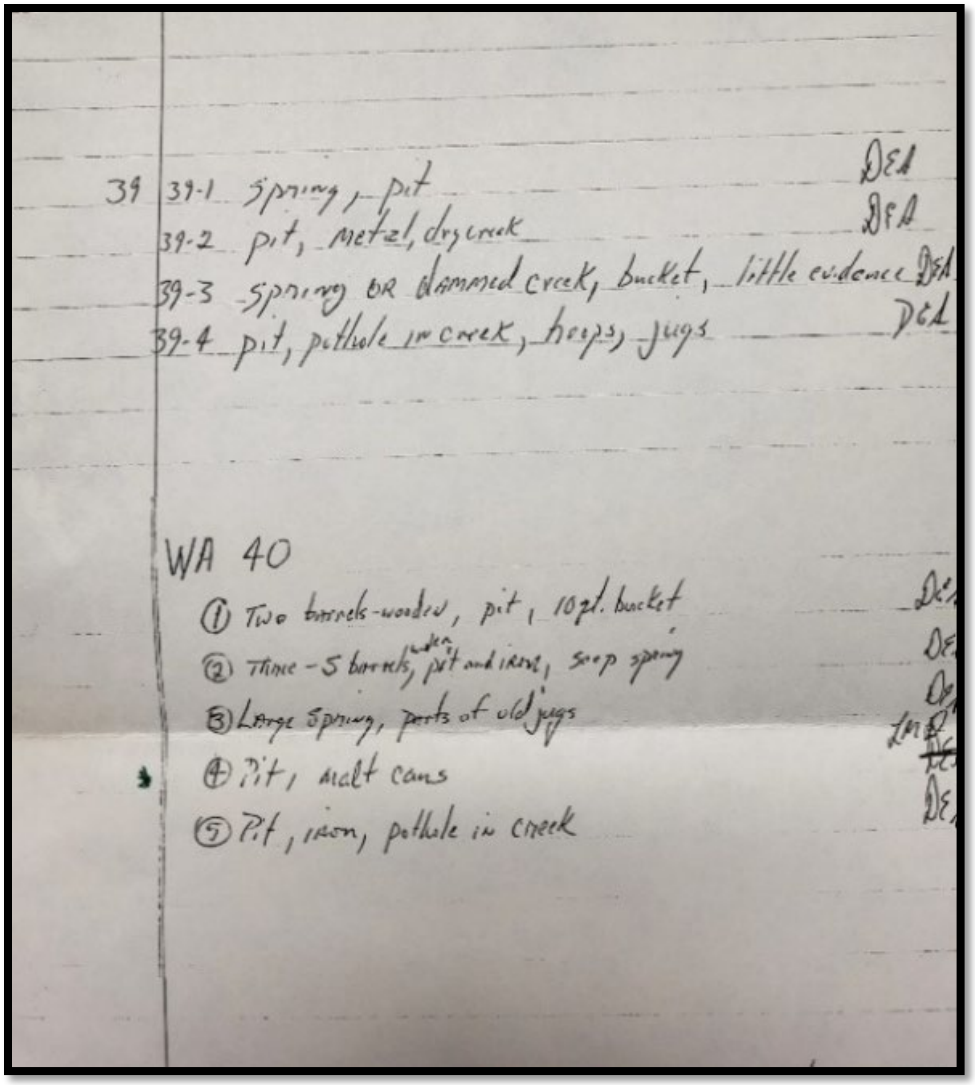

Figure 29 Correlated list of work areas and observations.

Using this map as a starting point, archaeologists at LBL began a process of recording these and other sites that became known either by accidental discovery or from local informant information. The first site visited, 15TR568 (LBL-8500), yielded the most intact remnants of a cooker and other remnants to date and is used here to describe the recording process.

To better understand a potential archaeological context of clandestine distillation sites on LBL, it's important understand how these contexts look throughout the Southeastern United States.

Alabama

The work of John Blitz (1978) is probably considered foundational for any archaeologist investigating clandestine distilleries or moonshine sites, and he's said to have discovered many still sites in Alabama (Medeiros 2016), though he didn't specify in his initial paper. His definitions of the pot still and the groundhog still are cited even today. Pot stills generally present a taller profile than the other types, often circular or cylindrical, and are built over a small firebox, often surrounded by stone, metal sheeting, or cinder blocks (Figure 3). A groundhog still (Figure 4) is one that is shorter, also often a cylindrical cooker, but mostly buried or sunk in the ground with one side open to a firebox (Blitz 1978; Medeiros 2016). Artifacts found on the surface at sites Blitz discovered included 5-gallon metal containers with punctures from an ax, indicating a destruction event. Also found were fuel oil cans, ceramic sherds of stoneware, fruit jars, plastic tarps and milk jugs, parts of metal drums, brick, and concrete blocks.

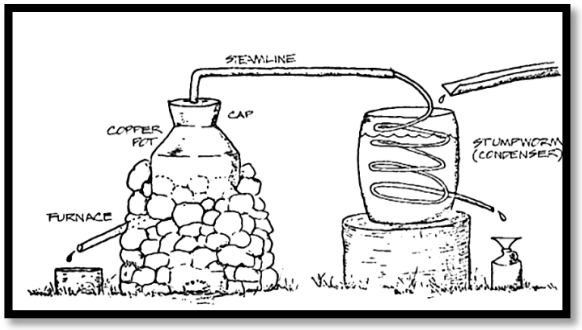

Figure 30 Pot still, from Blitz (1978).

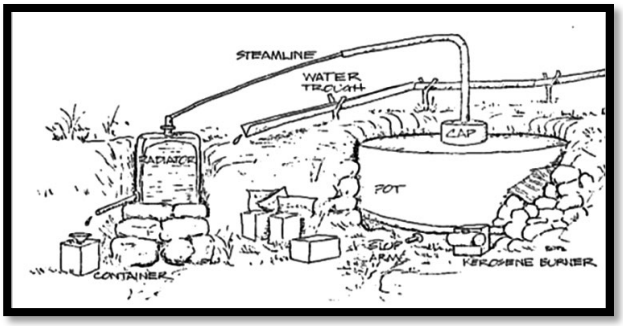

Figure 31 Groundhog Still, from Blitz (1978).

Between 2014 and 2016 Gorecki and Ryba investigated thirteen moonshine sites at the Bankhead and eight at the Talladega National Forests (Gorecki and Ryba 2014; 2015), mostly of the previously described groundhog style, but some were of the deadman style (three at the Bankhead NF; two at the Talladega). A deadman still (Figure 5), sometimes referred to as a "submarine" still, is one often associated with linear rows of stone, cinderblock, or sheet metal extending out from a square or circular firebox (Gorecki and Ryba 2014; Medeiros 2016). They recorded glass bottle fragments, metal drums, mason jars, a Fleischmann's yeast can, stoneware fragments, rusted metal pipes, wire nails, partially buried bedframe rails, metal buckets and basins, barrel hoops, rock-lined depressions, and stacked sandstone (some with soot and heat damage). The sites with their artifacts and features were found mostly in drainages or small hollows. Many of the drums and remnants of stills exhibited signs of destruction by law enforcement through puncture marks from axes, crowbars, or picks.

Figure 32 A 1964 Alabama whiskey raid on a moonshine operation with almost a dozen deadman stills. Photo: Alabama Department of Archives and History.

Mozayen and Pearson (2019) recorded seven new moonshine still sites on the Talladega National Forest during the survey for an Environmental Assessment. Key observations included sheet metal remnants of the stills along with ax marks on 50-gallon metal drums often used for mash fermentation or the construction of deadman or submarine stills. Surface artifacts located were mason jars, glass bottles, metal cans, barrel hoops, and plastic jugs. One of the sites had a dam constructed of stone for water catchment and storage.

For her master's thesis, Cassandra Medeiros (2016) investigated 107 moonshine still sites already known to the State of Alabama but not yet examined as a whole, and with only minimal individual data for most. Medeiros established a chronology, sought to identify settlement and land use patterns, and created a typology of Alabama still styles across four periods in two centuries.

Medeiros found that pot stills were the oldest type, followed by groundhog, then deadman stills as these stylistic trends spanned the 19th century, early 20th century, the Prohibition Era, and then the middle 20th century. She concluded it was likely the transition through these three styles was driven by a pressing need for better concealment. While sites appeared clustered around specific counties and major rivers, they were also frequently found

at higher elevations—perhaps for concealment and remoteness. She also found in many cases sites were strategically placed on public lands.

Tennessee

Pace and Gardner (1985) recorded over 125 still sites at the Big South Fork National River and Recreation Area, many of them in rock shelters. The types of stills they observed were pot stills with thump kegs and condensers connected by copper tubing.

The Big South Fork region of eastern Tennessee "was known for its abundance of moonshine and homemade whiskey" with perhaps as much as 5% of the rockshelters in the area being used for clandestine distillation (Sargent, et al 2016:110). Smith and Des Jean noted certain factors common to many of the sites recorded here: consistent water supply, rock overhangs for shelter, and a notable quality of seclusion that kept the sites hidden. Rock shelters and overhangs did double-duty in this regard, keeping the equipment and operators out of sight and out of the weather. Many, if not most, of the sites recorded at Big South Fork dated to the Prohibition era (Barrett 2020).

Also in Tennessee, Jared Barrett (2020) recorded two and six moonshine still sites in Roane and Marion Counties, respectively. These probably date to the early to mid-twentieth century and were described as in "heavily wooded hillslopes, behind existing obstructions, rockshelters, and caves," which keeps with the pattern of discretion one might seek to avoid detection. Artifacts described included barrel hoops and remnants of pot stills along with broken ceramics like stoneware. Notably absent were items of copper. Barrett does note the presence of puncture marks from pickaxes or axes in the sheet metal. Barrett surmises this was an effort to destroy the equipment either by law enforcement or perhaps a moonshining competitor.

Joseph Douglas (2001) reported on illicit whiskey production as an industrial use of Tennessee caves. He found that abandoned saltpeter mines were later used by moonshiners. He remarked that, other than mining saltpeter, illicit alcohol production was perhaps the most widely used activity in the caves with about 90 caves suspected of being part of the local moonshine industry. Artifacts associated with moonshine production in these caves included glass or ceramic vessels—either whole or in part—barrels, drums, pipes, and fireboxes of stone or other materials. Together, the artifacts provided a context to distinguish each site as moonshine related.

During a Phase I survey on the Francis Marion National Forest in 2016, which includes a region locally referred to as Hell Hole Swamp in South Carolina, three sites were documented with the remnants of clandestine distillation (Parker 2018). Each of the sites included hand-pressed cinder blocks laid out in parallel rows with ditching consistent with deadman-type stills. It is interesting to note that one of the stills Parker described was in the vicinity of a homesite that was occupied during the period when the still was operational. This would seem to argue against an effort to disassociate legitimate household activities from illegal alcohol production, which could result in seizures and forfeitures of property and arrests of accomplices (Henderson 1969). Parker does, however, remark that one school of thought is to ensure a still is on one's own property to avoid additional trespassing charges should one be caught.

PROJECT BACKGROUND

The Land Between the Lakes (LBL) has a rich history of alcohol production that begins with the earliest settlers in the late-18th and early-19th centuries. Early alcohol production was nearly always legitimate as alcohol was an important role in society even as early as the colonial period of U.S. history (Henderson 1969; Henry 1971; Craig 2006).

LBL was originally referred to as "Between the Rivers" (BTR) since this was a region of land nestled between the Tennessee and Cumberland Rivers. These rivers offered both opportunities and obstacles to the people that lived there both before and after European contact. Transportation and trade happened on these rivers. Periodic flooding continually revitalized the fertility of the bottom lands for growing crops. And the length, width and depth of the rivers helped limit access to the interior of this 40-mile inland peninsula (Henry 1971).

With the introduction of Prohibition in 1920 with the Eighteenth Amendment, innovators and businessmen of clandestine distillation were able to take advantage of the semi-isolation offered by the geographic circumstances of the BTR. The tight-knit nature of the BTR community along with the limited access to outsiders created by the rivers meant enforcers of the Volstead Act were easily identified and avoided (Henderson 1969; Henry 1971).

When the Twenty-First Amendment repealed Prohibition in 1933, clandestine distillation of liquor continued in BTR. Enforcement, however, increased drastically (Henderson 1969), perhaps due to the construction of two bridges spanning the Tennessee and Cumberland Rivers on what is today Highway 68/80. These bridges allowed for on-demand vehicular access to an in-land peninsula that was, for the most part, only accessible by ferries.

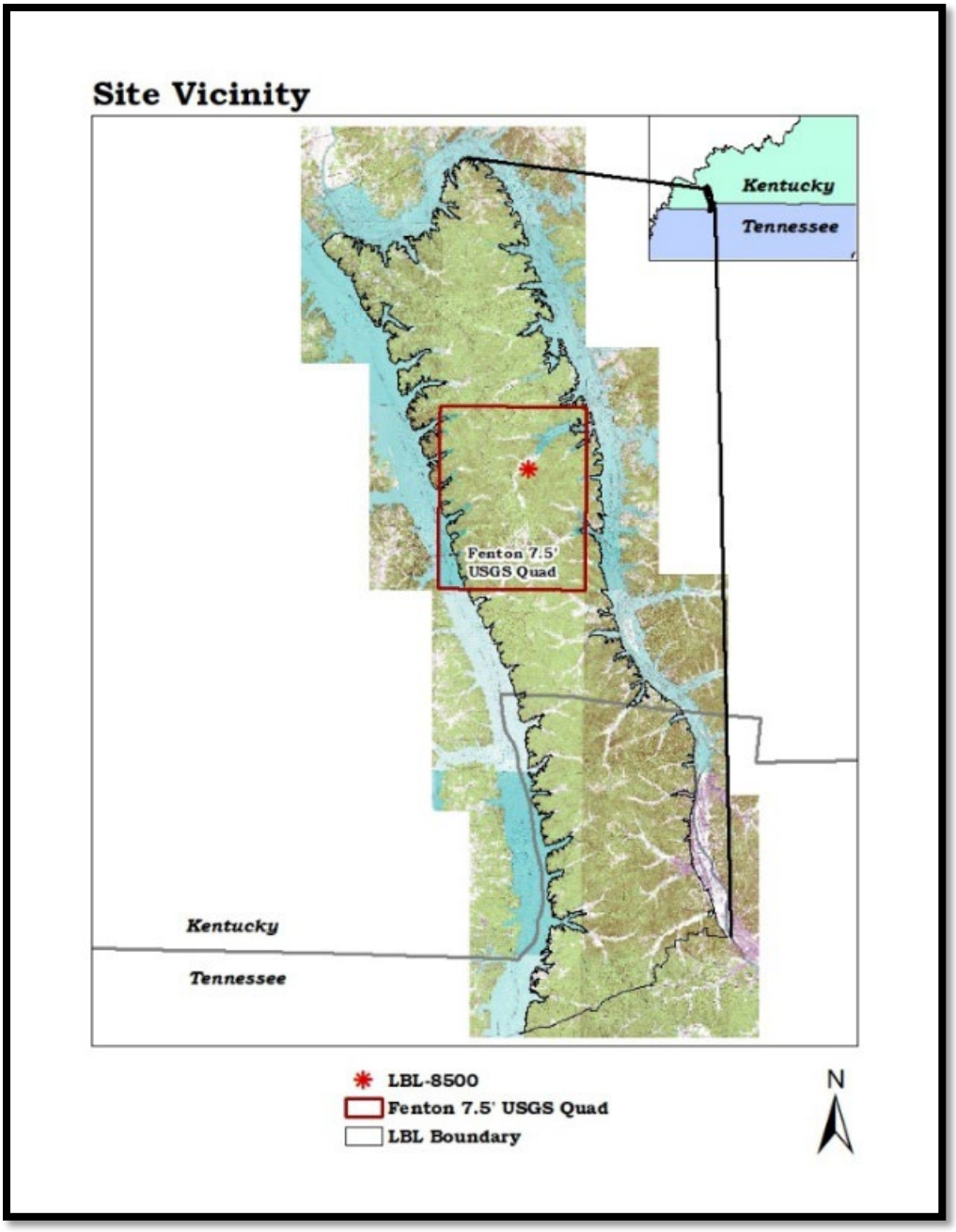

Figure 33 General vicinity of 15TR568 (LBL-8500) on LBL in Trigg Co.

Just prior to Prohibition's end, two key figures in the BTR moonshine industry died: Joe Bogard and Tom Hayden. These two prominent businessmen of the region were instrumental in organizing distillers with equipment, standardizing the local product, and navigating the social network of local authorities like county officials and law enforcement leaders to move whiskey from BTR to wherever the market took it (Henry 1971). Golden Pond, a small town situated in Trigg County and Between the Rivers, was often referred to as the "moonshine capital of the world" (West 2019) and local lore has it that Al Capone was especially fond of BTR whiskey, but

this seems to be more myth than reality. Genelle Bogard remarked the rumor likely began in the 1920s when a relative from Illinois visited in a Lincoln, perhaps an “L Series,” and would park in their carriage house (Bogard 1976).

Joe Bogard was a businessman, stock trader, and well-connected leader in the region. Tom Hayden was another businessman with a background in sales and distribution of groceries. Together they were able to supply others with equipment to produce whiskey and the connections to distribute it, giving a new industry to the BTR region through the Prohibition years (Henry 1971). Both men died at the end of Prohibition, Bogard six months prior to repeal, Hayden just a few months later (Kentucky, U.S., Death Records, 1852-1965).

Their deaths, the repeal of Prohibition, and the construction of vehicular bridges across both bounding rivers, may have changed the dynamics of illegal whiskey in the BTR. The loss of Bogard may have disrupted the network of social connections he maintained; the loss of Hayden may have disrupted the capital investments he was able to provide for new distillers. Also, the introduction of the bridges in 1932 may have literally opened the door for visiting law enforcement officials known as “revenuers” to begin their hunt for illegal still operators.

Even though Prohibition ended in 1933, whiskey distillation in the BTR continued. Many of the counties and communities of Western Kentucky remained dry up to very recent years, contributing to a demand for a supply moonshiners were willing to provide. Prominent revenuer William “Big Six” Henderson noted the whiskey makers of BTR generally got away with their activities until after 1942, when he was assigned to the Paducah office (Henderson 1969; West 2019). The new pressures from outside law enforcement with their ready access to BTR via the new bridges meant moonshiners needed any advantage they could obtain to stay ahead of the law.

NECESSITY IS THE MOTHER OF AN ARMS RACE

In the Kentucky portion of BTR, over 65,000 acres of land belonged to the Federal government through the Kentucky Woodlands Wildlife Refuge (Henry 1971). Moonshiners appeared to favor public lands, perhaps to disassociate themselves from the land used for illicit production of alcohol. Their mash barrels and stills were secluded in remote hollows of the refuge in Kentucky or on timber lands in Tennessee.

In BTR, the still of choice during and after Prohibition was the low-profile, square-form Casey Jones still, which is unique in that it has a square form-factor. This square or rectangular form serves two purposes: it fits neatly in the back of a 1940s pickup truck, and it has improved efficiency with temperature management. In addition, the Casey Jones still was built to be modular, making it very portable as it broke down into a few major groups: the cooker, the cap, the line-arm, and condenser. This made it easy to stash under hay bales or cover with a tarp and

move to a cook location without being noticed. The copper parts were lightweight and handles on either side meant two people could carry all the major components into a hollow on foot without much trouble (Henry 1971; Craig 1977; Casey Jones Distillery 2022).

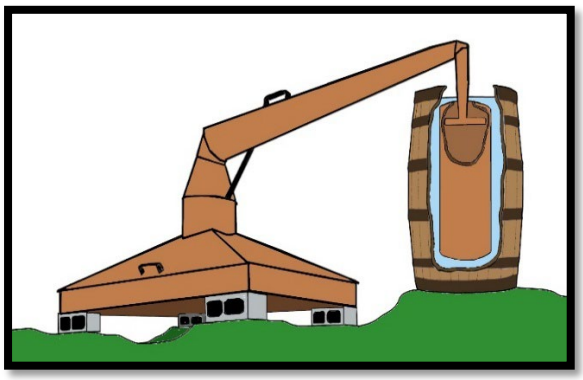

Figure 34 Casey Jones still modular set.

Figure 35 Casey Jones condenser inside the barrel.

The square form and low profile also meant the mash could boil faster and temperature was maintained more uniformly throughout the unit, causing a faster rate of distillation. In addition to the square form still, Alfred "Casey" Jones invented a new condenser that is essentially a double-walled, toroidal cylinder that was immersed in a barrel of cold water. This was in lieu of a worm-coil of copper tubing, and it created a faster condensation rate of the alcohol vapor, which has a lower boiling point than water. Overall, the alcohol separates faster and more easily than with traditional pot, groundhog, or deadman stills (Henry 1971; Craig 1977; Casey Jones Distillery 2022).

In addition, the Casey Jones still eliminates the need for a thump-keg, which is normally added between the cooker and the condenser to further vaporize the gas coming from the cooker, using its excess heat. A faster cook equated to more gallons of whiskey produced in a shorter amount of time, minimizing risk to the moonshiner by reducing time on the ground at any one cook location.

Moonshiners in the BTR also reduced their risk in other ways. They used what was locally referred to as "docks." These are locations where clandestine distillation is planned, whether the still is in place or not. Half-filled barrels or 55-gallon drums of mash or "goop," as it was locally referred to, were pre-positioned at a dock and left to ferment. While fermenting, these barrels were loosely wrapped in woven-wire fencing and leaves stuffed between the fencing and the barrels, which insulated the barrels, aiding in fermentation. The leaves also provided camouflage should a stray hunter or revenuer pass by on an overlooking ridge (J. Smith, personal communication, June 21, 2025).

A smaller barrel or drum might also be present with kerosene or gasoline, which was used as fuel for the cooker. As a heat source, a wood fire was possible, but it had two drawbacks: it was difficult to consistently manage the heat; and it produced a smoke column, which created a

literal pointer that could be seen for miles. A petroleum-based burner could be turned up or down to increase or limit heat and had the added benefit of being smokeless, thus less visible to the revenuer. The drum or barrel was generally pressurized using an attached bicycle pump (J. Smith, personal communication, April 12, 2025).

METHODS

The TVA moonshine activity map was heads-up digitized in GIS, placing points as close to the location indicated by TVA as possible. Based on the contour interval, it's estimated that accuracy of this effort is +/- 10 feet, which is more than sufficient to locate features and artifacts of clandestine distillation with a handheld GPS unit.

Metal Detection

Initial reconnaissance of each site is typically conducted with a metal detector and a leaf blower. The metal detector aids in locating barrel hoops, which are among the most common features described on the TVA map key. The signal produced by these steel rings, many of which are 56-68 centimeters in diameter, is unmistakable. In addition, other key elements of clandestine distillation are potentially located using a metal detector: wire fencing, pipes, cooker parts, mason jar lids or wire clasps, and fragments of metal drums. All these objects are often concealed beneath a dense layer of leaves from the deciduous forests of LBL.

Leaf Blower Application

For 15TR568, metal detector hits were marked with non-metallic flags revealing the potential extent of the site. Once the metallic signature of the site was revealed, a leaf blower was used to remove leaves and loose duff from the surface, exposing the artifacts and features. The blower used was a Stihl Magnum 500 backpack blower, which can remove artifacts as well as leaves, so a careful eye and cautious application of the trigger which throttles the engine helped manage the force of air. Changing the angle of the blower tube pointing at the ground or just using idle speed also helped avoid disturbing lighter artifacts like glass, ceramics, or small pieces of sheet metal.

Site Recording

Leaves and duff were exposed beyond the site sufficiently to get a sense of the overall site boundaries. From there the site was recorded like any other historic site. Photos taken of features and artifacts, an overall site sketch drawn (Figures 9 and 10), and geospatial data obtained for everything using a Juniper Systems Geode GNSS receiver, providing average accuracy of approximately 97.5 centimeters uncorrected beneath the forest canopy.

Excavation

To test subsurface presence of artifacts and features, an excavation unit was placed adjacent to the remains of the cooker. This was also an area of the site that was centered and flat, making it likely for smaller artifacts. We removed two layers of matrix: the first approximately 1 centimeter of an organic layer composed of roots and loose duff; the second was a layer between 2 to 3 centimeters of silt loam and some loose gravel. This layer was terminated at a dense layer of gravel on which the site appeared to be sitting.

All soil was removed by hand troweling to a bucket, recording artifacts as they were revealed. The removed matrix was sifted through a quarter-inch mesh screen over a plastic tarp. Artifacts found in the screen were bagged and recorded by level.

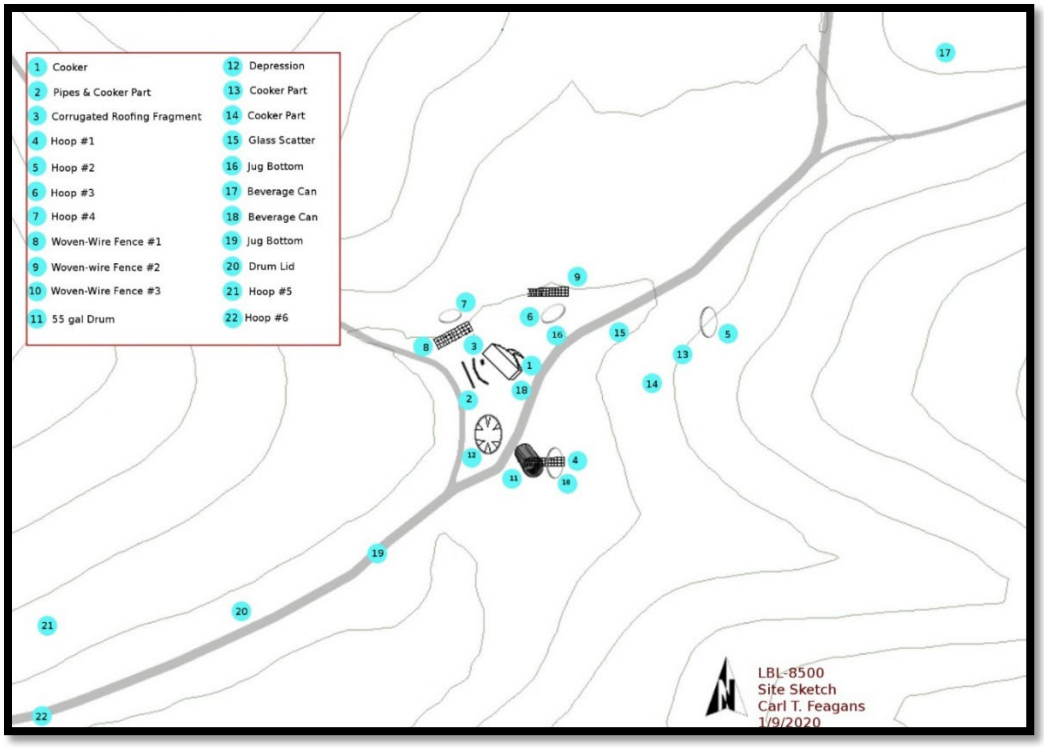

Figure 36 Initial site sketch of 15TR568 (LBL-8500) illustrating the distribution of artifacts and features.

Figure 37 Overview of 15TR568 labeled to correspond with above sketch map.

RESULTS

Using a leaf blower at the site to remove leaves was the single-best method of exposing the site for recording. The 1x1 meter unit, while it yielded several artifacts, was not as productive as expected. What was revealed by the leaf-removal, however, was a site of approximately 85 square meters with a cooker, a 55-gallon mash barrel, remnants of at least 2 wooden stave barrels, and a roll of woven-wire fencing as well as artifacts like glass and ceramic jug bottoms, glass shards, nails, metal pipes, and soda cans.

The still, though bent, folded, and rusted by time and weather, measured 121 centimeters wide, 96 centimeters long, but damage was too great to gauge the height. It was constructed of galvanized steel less than 1 mm thick. The corners were soldered, seams were folded, and there were straight nails driven through where two other seams came together (Figure 8). Two copper handles were soldered to the upper portions of the two long edges.

Adjacent to the cooker remains is a rectangular depression, perpendicular to the creek. This depression is approximately 160 centimeters wide and 220 centimeters long and approximately 40-45 centimeters deep. In this depression were two lengths of metal pipe, approximately 4.5 centimeters in diameter (3/4 inches) and 123 centimeters long.

Less than 1 meter northwest of the cooker is a flattened roll of woven wire fence. Based on the width and the number of rolls, it's estimated to be a roll 4-5 meters long. Just beyond that roll of fence is the first of four steel hoops from one or more wooden stave barrels. The other three were found within the site's boundaries: one just 2.5 meters to the northeast, on the same side of the creek, and two across the creek 8 meters east and 5 meters south-southeast.

Also across the creek were several pieces of sheet metal, possibly parts of the cooker, a scatter of broken glass, a shorter roll of woven wire fence (1-2 meters), and the remains of a 55-gallon drum. The drum's lid was originally located in the creek, just 17 meters downstream from the drum itself.

Two soda cans were in or near the site. One located adjacent to the cooker, had a modern stay-on-tab and was made of aluminum. The second can was located on a knoll 35 meters northeast of the site. This can had a pull-tab and was constructed of steel.

Additional artifacts were found downstream from the site and considered to be associated with it. These included additional barrel hoops for a total of 11, two additional jug/jar bottoms, a fragment of milk glass, and a tapered length of copper strap 50 centimeters long and 6 centimeters wide that tapers to a point.

DISCUSSION

The "Casey Jones" Still

The still found at 15TR568 (Figure 11) is one that has a square form-factor. This style of still was developed by Alfred "Casey" Jones (1898-1980) and first put into use during prohibition. While Jones developed this style of still, he may have been influenced by cookers used in rum distillation in Florida. The low profile of the deadman or submarine stills also share some characteristics with the Casey Jones still, but many of these are described as cylindrical and deadman stills that were rectangular were generally much taller than the Casey Jones. This still's square form-factor coupled with a lower profile allowed for a more even distribution of heat from a fire or burner placed underneath and the shorter height allowed better control of the internal temperature. The square form of the still allowed it to be transported in the bed of a wagon or pickup truck (Craig 1977).

Jones was fond of using only copper which he fashioned into square and rectangular forms with snips, a hammer, pliers to crimp with, and a soldering iron (Craig 1977). Jones also innovated a condenser during Prohibition that effectively doubled alcohol production, though an example of this is yet to be located at a site on LBL. He preferred copper over other metals like steel because there was no zinc coating to react with the alcohol (Craig 1977) and he only used silver solder since lead-soldered parts could become a source of lead poisoning for those who consumed alcohol that encountered them (CDC 1992). It might also be important that copper is a necessary element to reduce sulfur compounds which have a significant impact on aroma and flavor (Forney and Song 2017). A 2012 study demonstrated how the inclusion of copper in the distillation process was instrumental in drastically reducing dimethyl trisulphide (DMTS), which has an aroma described as rotten vegetables even when present in very small amounts (Harrison et al 2011).

It's not known if Jones was aware of the reduction in sulfur compounds or even that more favorable aromas were produced with copper, but he sourced large quantities of it from a supplier in Paducah and isn't known to create cookers, line arms, or condensers from any other material. The cooker found at 15TR568 is made of steel, and this may be the reason it remains in situ since copper is valuable enough to be recovered either by the original distiller or by a hunter who happened upon the site. The still's cap, line arm, and condenser were not located, but since these were likely constructed of copper, they were probably deemed of more value by the operator.

Figure 38 The remains of the Casey Jones style still at 15TR568, made of steel not copper.

Woven Wire Fencing

Woven wire fencing appears to be common to distillation sites and was located at other sites recorded on LBL. In large-scale distillation operations, it's believed that distillers kept hogs to dispose of spent mash. Nick Laracuente notes that for a 100-gallon still, 30 head of hog could be fed off the spent mash, offering supplemental income for the distiller (NKU History Department 2021). However, ethnographic data revealed by local informants provides an alternative explanation for the clandestine distillation operation.

When creating a dock, the site of clandestine distillation that has barrels of mash, or "goop," waiting for a cooker to arrive, woven wire fencing was used to wrap around the barrels to insulate them, aiding in the fermentation process, and to camouflage them from passers-by (be they revenuers or hunters).

This is supported by the fact that the linear measurements of fencing found at these sites are insufficient for hogs, often found rolled or bundled, and not fixed to trees as one might expect for a pen. Rolling or bundling the fencing would be necessary for a distiller wanting to access one or more barrels wrapped and insulated.

Common to clandestine distillation sites on LBL are 55-gallon metal drums and the steel hoops from wooden stave barrels. Often the metal drums are punctured 3 to 5 times with punctures consistent with a hand ax, pickax, or hatchet, which is a clear indication the site was raided by law enforcement. At one such site in Tennessee, LBL archaeologists recorded 47 individual drums dating to the middle 1960s at a location that matches a newspaper account of a raid that destroyed over 1200 gallons of mash (Henry 1971). At first glance, 47 55-gallon drums would seem to indicate over 2500 gallons, but local informants shared many times that a distiller would likely fill a drum only about half-way to keep the weight manageable and allow space for the fermentation process, which would put 47 drums closer to 1200 gallons.

While the metal drums appear favored for containing fermenting mash—they're inexpensive, easily sealed, and resist leaking—wooden stave barrels are clearly present at these sites. There were 11 steel barrel hoops associated with 15TR568, which would indicate the minimum number of wooden stave barrels equals at least two. Each oak stave barrel has six steel hoops: two head hoops (at both ends of the barrel), two bilge hoops (on either side of the widest part of the barrel), and 2 quarter hoops between each of the head and bilge hoops (Figure 12).

The obvious purpose for these wooden barrels is for color and flavor. Storing the finished product in a charred oak barrel imparts a distinctive reddish color, helping it resemble bourbon. Charred barrels also helped improve the flavor profile of the whiskey in a way that storing it in clear gallon jugs or stoneware jugs doesn't.

Figure 39 Types of barrel hoops-each slightly different diameter.

Another use of the wooden barrel is for the condenser, which needed relatively cool water to aid the condensation process. This may be an instance where the propensity for a worn or damaged barrel to leak was an advantage since a constant introduction of fresh cool water kept the overall temperature lower and the rate of condensation up. Water could be continually

added by bucket from a nearby source or from a pipe or sluice originating from a creek. Living descendants of local moonshiners insist that two condensers per still was not uncommon, making two wooden stave barrels to cool the condensers likely.

Cans and Glass

Initially, the site was thought to be no older than 1959, based on one of the two beverage cans located at or near the site. One can was made of aluminum with a stay-on-tab, two features together that weren't introduced until 1989. The second can was made of steel and had a pull-tab that detaches. This can was dated to between 1962 and 1975.

However, it's now believed that both cans represent visitors at or upstream from the site years after it was abandoned by the distiller. The beverage can found closest to the cooker was of a modern design and almost certainly a much later addition, possibly even deposited by the stream after being discarded along the ridge line higher up. The steel can was located on a small knoll overlooking the site, making its association somewhat tenuous but less likely to be deposited by flash flooding of the stream. If deposited by the distiller, it would date the site to the early to middle 1960s since it would be unlikely for a moonshiner to want to operate a still after TVA assumed control of LBL, which was 1964. There was significant activity in this region with road and timber crews not to mention recreation-seeking visitors. Since we know TVA observed a site on this ridge between the 1960s and 1980s, it could be that the can was from one of its work crews or a hunter.

The glass fragments found included some bottoms of jugs and jars, which are generally thicker and more resilient to the forces of nature that can break apart the thinner sides and shoulders into much smaller pieces. Consequently, at least four bottoms were located, three within the site boundaries and one 23 meters away and downstream in the creek. Of these, one was of brown glass, the rest clear. Among the clear bottoms were two 1-gallon jugs and one 1/2-gallon fruit jar.

The fruit jar was identified by the Hazel-Atlas maker's mark (Figure 13), stippled bottom, "17-1" manufacturer's code, and a pronounced inward curve. The "H over A" maker's mark was in use from 1923-1964.

The two 1-gallon jug bottoms were more forthcoming with information. Both were marked "Duraglass" along the side near the bottom vessel and both were manufactured by Owens-Illinois. One was marked with a date code of "8" (Figure 14) which indicates 1948 or possibly 1958. Initially, many bottle manufacturers used a single digit date code to know the year of manufacture. This practice changed in the 1950s when it became apparent that bottles would be returned for re-use across decades, creating confusion for single-digit codes. Not all factories re-tooled right away, so some in the 1950s continued the practice of single digits. The second jug bottom was dated to 1951 with a 2-digit date code (Figure 15).

Other glass fragments were found. Some were certainly fragments from the gallon jugs and mason jars. At least one fragment appeared to be the shoulder of a small bottle. Many of the fragments appeared to be just to the west of the cooker in the stream and on the bank across from it. Several fragments were recorded south of the cooker, and downstream.

Figure 40 Hazel-Atlas "H" over "A" jar bottom.

Figure 41 Owings-Illinois jug bottom probably manufactured in 1948.

Figure 42 Owings-Illinois jug bottom manufactured in 1951.

Other Artifacts

In addition to the artifacts already discussed, two metal pipes were found adjacent to the cooker either in or near the depression, one side of which connects to the creek. While it's possible these were parts of a burner assembly, they were of different diameters, both being diameters too large to efficiently move petroleum vapor to a burner. A photograph taken in 1941 in the Kentucky Woodlands Wildlife Refuge, the same refuge 15TR568 is in, shows a very similar still in a very similar type of location with a very similar depression (Figure 16). In this photo, the still, which is also a Casey Jones style, is resting on a pipe spanning the depression. And that still's drain is pointed at the creek, which would have been a convenient way to dispose of the spent mash.

Across the creek is at least one section of sheet metal that was exposed to the surface, with the remainder underneath 1-2 centimeters of soil, likely deposited from seasonal flash flooding. The intent is to excavate this section with a 1x1 or 1x2 unit in the future to determine if this is a section of the cooker or perhaps something else.

Figure 43 A Casey Jones Still at an unknown site in the Kentucky Woodlands Wildlife Refuge, 1941.

CONCLUSION

The investigation of 15TR568, The First Moonshine Site, is one intended to be a model for future exploration of the archaeology, anthropology, and overall heritage of the moonshine industry at Land Between the Lakes. There is certainly a physical aspect to clandestine distillation about the artifacts and features found at each site and it's our hope the work done at 15TR568 will set a framework for investigating the dozens of additional moonshine-related sites that need to be recorded on LBL.

In the process of recording and investigating 15TR568, the Heritage team learned the following that can be applied to future investigations:

- A leaf-blower is an essential piece of equipment in the deciduous forest to remove leaves and expose artifacts and features.
- A metal detector is invaluable for locating moonshine sites when the largest objects left behind are barrel hoops. It also helps define a site boundary since metal is so ubiquitous at still sites.
- Ax, pickax, or hatchet punctures on sheet metal or barrels is a solid indicator that a site is moonshine-related and discovered by law enforcement.

- Copper artifacts are rare at moonshine site because of the demand for the resource.

The overall date of 15TR568 is concluded to be no earlier than 1948 and no later than 1964 with the early to mid-1950s being a likely date. This is based on the manufacture date of artifacts located on the site bracketing the early date and the acquisition of the Kentucky Woodlands Wildlife Refuge by TVA at the later date. This acquisition put dozens of TVA workers and crews on the landscape, creating risk of discovery for a still operator willing to risk distillation on public land.

The still at 15TR568 is a significant and rare artifact, particularly considering it shows no evidence of puncturing by law enforcement, indicating it likely went undiscovered and was abandoned by the operator. Of the dozen or so moonshine sites the LBL Heritage archaeologists have been able to survey so far, 15TR568 is one of only two that had a still. The other still, found in Tennessee, was a converted 55-gallon drum with a copper cap and marked by several ax punctures.

Not being constructed of copper may be significant for two main reasons:

1. It may indicate the operator's reason for abandoning the site outweighed his need for the still in the future. Perhaps he left the business or perhaps he obtained a copper version. Both possibilities raise the question of why not sell or barter the still?

2. This was unlikely to be a still of Casey Jones' own creation and, thus, a copy created by someone familiar with his work. Were they an admirer? Was the style, sans copper, still recognized as superior?

Future investigations in the rich heritage of the moonshine industry at the Land Between the Lakes National Recreation Area will certainly include archaeological surveys and detailed recordings of each site encountered. The Heritage team recently obtained high resolution LiDAR data for LBL, which will be a part of each survey. In addition, the team is currently planning to incorporate terrestrial LiDAR at a large, as yet unrecorded site in Tennessee that is littered with at least 47 55-gallon mash barrels. If successful, this technique will find use at historic sites in both the Kentucky and Tennessee portions of LBL.

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THE CLEVELAND-ROGERS MILL SITE ON BOONE CREEK, FAYETTE COUNTY, KENTUCKY: AN ARCHIVAL AND ARCHAEOLOGICAL STUDY

by:
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ABSTRACT

A complex of mills including a flour mill, hemp mill, and sawmill were established by Eli Cleveland in southeastern Fayette County, Kentucky during the early 1790s. These mills were constructed on Boone Creek, a tributary of the Kentucky River, which forms the boundary between Fayette and Clark counties. During March of 1796, Cleveland's enemies tried to burn his mills and caused significant damage to the flour mill. Cleveland decided to sell his mills, warehouses, boat yard and ferry in June 1796. In 1801, Joseph Rogers and his son Jeremiah Rogers acquired Cleveland's mills. Jeremiah Rogers operated the mill until his death in 1836, and his heirs continued the business. The mill burned in the 1860s and was not rebuilt. This paper combines archival records and archeological fieldwork to provide a more in-depth history of the Cleveland-Rogers mill complex. Archival information is presented on the history of ownership, descriptions of the surviving houses occupied by Cleveland and Rogers, references to Eli Cleveland in early accounts and other sources, information on Cleveland and Rogers slaves, and newspaper ads for the mills. A discussion section mentions other mills on Boone Creek and the manufacturing processes used at the mill complex. The conclusions summarize some key points.

INTRODUCTION

Eli Cleveland owned and operated a mill complex on Boone Creek in southeastern Fayette County, Kentucky during the early 1790s. The complex included flour, hemp and sawmills. In 1801, Cleveland sold his mills to Joseph and Jeremiah Rogers, and the mill subsequently became known as Rogers Mill. Jeremiah Rogers operated the mill until his death in 1836 and passed it on to his heirs. The mill burned in the 1860s and was not rebuilt. Fayette County is within the heart of the Blue Grass region in central Kentucky. It is bordered by Scott County on the north, Bourbon and Clark counties on the east, Madison County on the south along the Kentucky River, and Jessamine and Woodford counties on the west. Lexington, the county seat, was located about 12 miles northwest of Cleveland's mills. Boone Creek (Figure 1), a tributary of the Kentucky River,

flowing north to south, forms the boundary between Fayette and Clark counties. Harry Enoch (2002:1) stated that Boone Creek "…is noted for its steep cliffs, cascading waterfalls, and … is about ten miles long, as the crow flies…" Mills within Cleveland's complex were significant in the local economy since they processed wheat, logs, and hemp into needed products. The mill was initially recorded by archaeologist Nancy O'Malley in the fall of 1991 as part of her coauthored report entitled *Milling and Related Industry in the Boone Creek Drainage, Fayette and Clark Counties* (Amos and O'Malley 1991). Twenty-four years later, I published an archival study on Eli Cleveland's Mill (Hockensmith 2015). On April 2, 2018, I was invited to visit the mill ruins by Dan Isenstein, Hemp Highway of Kentucky, and Boone Creek Outdoors that operated ziplines through the nearby forests. Nancy O'Malley was also invited to participate in the field trip but had a scheduling conflict. Since Nancy O'Malley had only been able to spend one hour at the mill in 1991, I decided to take the opportunity to redocument the physical remains associated with the mill in much greater detail. In the years following my fieldwork, I thought that it would be beneficial to other mill researchers to publish an article that combined my previous archival research with my archeological observations. I decided to expand the archival research to include information on the Jeremiah Rogers who owned the mill after Cleveland. This article endeavors to present available archival information and my archaeological observations to enhance our understanding of the Cleveland-Rogers Mill ruins.

Figure 1. View of Boone Creek and the cliff (on the Clark County side) across from the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing downstream to the south. Photograph taken by Charles D. Hockensmith on April 2, 2018.

According to O'Malley (1991b:33), Eli Cleveland owned three large tracts of land along Boone Creek totaling 942 acres acquired during 1785 and 1788. Cleveland also acquired another 1,400 acres along Boone Creek in 1786 from his brother Alexander (O'Malley 1991b:33). Further, O'Malley (1991b:33) stated, "These acquisitions resulted in Eli Cleveland owning all of the land

on the west side of Boone Creek, down to the Kentucky River…Cleveland was responsible for most of the earliest industrial development of the lower reaches of Boone Creek and its junction with the Kentucky." *The Kentucky Gazette*, on February 13, 1793, mentioned that Eli Cleveland lived near the mouth of Boone Creek (Kentucky Gazette 1793a:2). O'Malley (1991b:33), quoted sources indicating that Cleveland lived near present day Clay's Ferry. Several ads published in *The Kentucky Gazette* newspaper between 1793 and 1796 mentioned Cleveland's mills. This portion of the article is a greatly expanded version of my archival research published in 2015 (Hockensmith 2015). The 2015 article was based on the site survey form prepared by Nancy O'Malley in 1991, her report, and my archival research (Hockensmith 2015). The 2018 fieldwork at the Cleveland-Rogers Mill site permitted me an opportunity to take measurements of the surviving mill remains, produce a detailed scaled sketch map of the archaeological remains, and document the site with digital photographs.

The Kentucky Archaeological Site Survey Form for Rogers Mill (15FA217) provided a detailed chronological discussion of the ownership for the Cleveland-Rogers Mill Site (O'Malley, Amos, and Snyder 1991:7-8). O'Malley's comprehensive chain of title searches for the mill property provided key dates for the various land transactions (O'Malley, Amos, and Snyder 1991:7-8):

> The mill site was probably first established by Eli Cleveland who owned a great quantity of land on the Fayette side of Boone Creek (along with a smaller quantity on the Clark side) from the Kentucky River up to Grimes Mill. He acquired the land through assignment of a Virginia land grant issued to his brother, Alexander, and through private purchases. He established the mill, a ferry on the Kentucky River and warehouses. On September 15, 1796, he entered into an agreement with John Fowler and Hugh McIlvain to convey 442 acres (from a land grant) and 20+ acres he purchased from Triplett, including the mill, warehouses and ferry for a series of payments. Fowler sold his interest to McIlvain in the 1790s, then in 1801, Joseph and Jeremiah [Rogers] acquired the tracts and businesses from McIlvain. Eli was paid his purchase price but never filed a formal deed. Then Rogers sued Cleveland in 1815 for a deed of transaction. They won the suit, and Cleveland was compelled to give up title (Fayette County Circuit Court; Rogers vs. Cleveland, McIlvain and Fowler).
>
> Joseph Rogers later conveyed his interest to Jeremiah Rogers who operated the business until his death. His will (Fayette Will Book M:294) was probated in August of 1836. His son, Jeremiah E., was devised the "mills". Jeremiah E. died intestate in 1876, and his son, Jeremiah E., Jr., inherited the property, although by this time the mill was no longer in operation. From him the property passed to Nettie Howell Rogers and her children in 1897. A Mrs. Atkinson in 1891 and S. Atkinson in 1904 are shown living at the house site now occupied by Mrs. Snyder near this site, but they were apparently just tenants. John T. and Thomas J. Denton bought the property in 1912 (Fayette Deed Book 165:440). Howard G. Early bought the property in 1922 (Fayette Deed Book 209:335). His daughter, Jane Early Snyder,

now owns and resides on the tract in a house southwest of the mill site, on Durbin Lane.

An excellent overview of Eli Cleveland's land holdings over time was compiled by Mary E. Wharton and Roger W. Barbour's (1991:45) in their book *Bluegrass Land & Life; Land Character, Plants, and Animals of the Inner Bluegrass Region of Kentucky*:

> The old land entries show that between 1782 and 1792, Eli Cleveland entered over 17,000 acres, through a few thousand were noted as "withdrawn," evidently meaning there were prior claims, and several thousand were apparently outside the Inner Bluegrass. Over 6,000 were in Fayette County along the Kentucky River, Boone Creek, Elk Lick Creek, and Raven Run. In the same area in 1786, he added by purchase the 1,400-acre settlement and preemption rights of John Holder and also purchased 206 acres from another man. In 1787 Cleveland began selling his Fayette County land. Between that time and 1816 he sold 5,233 acres in 22 parcels, ranging in size from 12 to 622 acres. Then, in 1816, he conveyed to Levi Hart all remaining land that he had not previously sold between Elk Lick and Raven Run, believed to be about 1,000 acres, by quit claim deed so that he would not be responsible in the event of any prior claims. Before 1819 he sold an additional 1,066 acres in two tracts.

THE CLEVELAND-ROGERS HOUSE

We are very fortunate that the houses occupied by the original mill owner Eli Cleveland and the subsequent mill owner, Jeremiah Rogers, have survived. The Cleveland-Rogers House (FA137) was located near the mill and is currently part of the Riverside Farm (Robinson and Kerr 1980). Located at 8151 Richmond Road (U. S. 25), this historic house, cabins and outbuildings situated on 6.9 acres were listed on the National Register of Historic Places on August 26, 1980. Later, the Cleveland-Rogers House was included within the Boone Creek Rural Historic District (Powell 1994). The historic structures are on a 160-acre horse farm overlooking Boone Creek. Two log cabins, built ca. 1786, are associated with Eli Cleveland's occupation of the property. Cleveland's log cabins (Figure 2) measured 18 x 19 feet and 18.5 x 23.5 feet, both cabins had a stone chimney, one door, one window, and a loft (Robinson and Kerr 1980:2). It is assumed that these cabins were occupied by Cleveland. Robinson and Kerr (1980:2) describe the main house built by Jeremiah Rogers (Figure3) as follows:

> The Rogers house is a one-and-a-half-story, five bay, brick dwelling-built ca. 1819. The exterior is laid up in Flemish bond on the principal façade and common bond on the three others. The massing floor plan, exterior and interior trim, front porch, and fenestrations are all characteristic of the Federal period (photo 1).
>
> The windows are nine-over-nine and are located on either side of the portico to give the façade its Federal appearance. A one-story portico with an elliptical

fanlight piercing the tympanum shelters a double door with a transom below (photo 2). Each of the windows and the door have a reeded molding with corner blocks and shutters on either side of the opening (photo 3). The rear door is treated in a similar manner. Four chimneys, two on each side, rise above the gabled roof.

On the interior, the Rogers house has a wide central hall with two large square rooms on each side. The interior is richly embellished with carved window and door jambs, chair rail, and mantels (photos 4, 5, and 6). Each mantel is carved in a different manner and look as if they were done by early Bluegrass craftsman, Mathew Lowry. Most of the original ash flooring remains. An unusual feature is the trunk room which utilizes the space in the pediment of the portico.

Figure 2. Photograph of one of Eli Cleveland's ca. 1786 log cabins on Richmond Road in Fayette County, near Boone Creek, taken by Bettie L. Kerr during 1980. Courtesy of Bettie L. Kerr and the City of Lexington Historic Preservation Office.

The Cleveland-Rogers House nomination also includes the surviving outbuildings. These structures included a brick smokehouse, an early log barn, a corn crib, and a frame buggy house (Robinson and Kerr 1980:2). An early stone wall was also on portions of the nominated area.

A brief history of the property's ownership over time was compiled by Robinson and Kerr (1980:3):

> The two early owners were both of prominent early settling families of the Bluegrass region. Eli Cleveland, who built his log cabins about 1786, was a magistrate serving Fayette County in the year 1792. He also owned the first mill in the area which evidently burned in 1796, according to an open letter from

Cleveland, published in *The Kentucky Gazette* of March 28, 1796. Eli Cleveland sold his land of 442 acres and other tracts to Joseph and Jeremiah Rogers on November 3, 1819. The one and one-half story brick house was built by Jeremiah Rogers in 1819-1820. Jeremiah, the son of Joseph Hale Rogers, had full ownership of the property in 1822, his father having deed[ed] over his one-half undivided interest at that time. Joseph Hale Rogers had come to Kentucky from Culpepper County, Virginia, about 1784, settling at Bryan Station, where he owned over 4,000 acres. There Joseph Rogers built, in 1794, a fine Federal style brick house, known as the Joseph Hale Rogers House (listed in the National Register November 15, 1979). Jermiah Rogers lived in his house on Richmond Road until his death in 1836, at which time the house passed to his wife Fanny and then to their son Christopher C. Rogers. The house remained in the Rogers family until 1910 when the current owner's family bought the farm. The Cleveland-Rogers House and complex has been owned by only three families since its creation.

Figure 3. Photograph of the Jeremiah Rogers House on Richmond Road in Fayette County, near Boone Creek, taken by Bettie L. Kerr during 1980. Courtesy of Bettie L. Kerr and the City of Lexington Historic Preservation Office.

Famous architectural historian and prolific author, Clay Lancaster, included the main structures associated within the Cleveland-Rogers House in his book Ante Bellum Houses of the Bluegrass (Lancaster 1961). Lancaster published both plan views of the cabins and elevations for the south sides of both Cleveland log cabins (Lancaster 1961:3-4). Likewise, Lancaster (1961:42) published a detailed first floor plan of the Cleveland-Rogers House showing all the rooms and a drawing of the west view of the house.

A discussion of the Cleveland-Rogers House is also included in another book by Richard S. DeCamp and Patricia S. DeCamp (1985) entitled *The Bluegrass of Kentucky: A Glimpse at the Charm of Central Kentucky Architecture*. The authors provided a discussion of the architecture of

the Cleveland-Rogers House and provided a high-quality photograph of the Rogers House (DeCamp and DeCamp 1985:64-65).

LITERATURE MENTIONING ELI CLEVELAND

There are some surviving interviews with pioneers that mentioned Eli Cleveland. In Dale Payne's (2008) compilations of memories collected by John Dabney Shane during his interviews with earlier pioneers, two references were found to Eli Cleveland. First, in the memories of Samuel Potts Pointer (born in Virginia in 1769) who came to Kentucky in November of 1788 (Payne 2008:18-19). Pointer provided the following memories (Payne 2008:19):

> I lived at Reuben Smith's, near Boone's Station. I had known him in Pa. I worked with Eli Cleveland harvesting 10 days in 1789. He lived at the mouth of Boone's Creek, had a mill there. He had hounds to hunt, lived in a neck, called Cleveland's Neck. He had a place posted in to keep deer. If anybody went in to shoot, they would set the dogs on them. Twas said the dogs were dangerous, but they never troubled me. Cleveland was rich! rich! twas said he hadn't slept with his wife for 14 years.

A second interview with David Thompson mentioned a land transaction with Eli Cleveland (Payne 2008:28):

> My father removed from Louisa County, Virginia to Craig's Station in the spring of 1787. Mrs. Searcy and Scott's son were killed that spring. He then moved up to Boone's creek in now Fayette County and got land of Eli Cleveland. This in the fall of 1787 rather than the summer of 1787.

In his book, *Pioneer Voices: Interviews with Early Settlers of Clark County, Kentucky*, Harry Enoch (2012:58) provides additional details about Eli Cleveland's dogs from a Shane interview with pioneer John Rankin:

> Eli Cleveland had four or five brindle dogs—bull dogs—very fierce. Lived about 2 miles from us, across the creek, Boone's. People couldn't go there. Had to get up on something.

Another early interview that mentioned Eli Cleveland was one with Sarah Muir Boone of Boone Station in Fayette County (Enoch 2012:98). Mrs. Boone married Baptist minister Thomas Boone, the grandson of Daniel Boone's brother Samuel (Enoch 2012:98). Sarah Muir Boone's comments about Eli Cleveland were summarized by Harry Enoch (Enoch 2012:98):

> Mrs. Boone recollected Eli Cleveland. His wife was a [Mary] Hazlerigg, a sister of John Hazlerigg. Cleveland was a Baptist. He wanted to preach among the Baptist but was too long and tedious. People didn't like to hear him. Mrs. Boone didn't convey a favorable idea of his character. He was not listened to with confidence. Was shot at several times. Shot once in his bed. Had a good many adventures.

Eli Cleveland published a letter to the editor (John Bradford) in the December 13, 1794, issue of *The Kentucky Gazette* (1794:2). He was expressing his frustration with the inspectors who inspected tobacco, flour, and hemp left at his warehouse on the Kentucky River at the mouth of Boone Creek. Eli Cleveland noted the problems of having inspectors living ten miles away from the warehouse and how he was not receiving the money due him for the use of his warehouse:

> MR. BRADFORD,
>
> SIR,
>
> I Have been informed the inspectors of tobacco at my ware-house, have spoke to two or three of the Representatives of this county, and also are about to have drawn a petition to the General Assembly, to have my ware-house put down.—It is well known I have the best ware-house on the Kentucky, and a convenient house for my scales, which cost me near 20l. Chains, and scales well ironed &c.—The way leading to the same is perhaps equal to any on the Kentucky—Now sir, the law not having made any provision for persons who have put themselves to so much expense, I refuse the inspectors the use of my scales—they have often insulted me very much, because I would not give them up to their use, so that they might make a fortune out of my property; I have also a lock to my ware-house, the key of which they keep in their possession, ten miles from the ware-house; and tobacco at this time brought there and obliged to be left, must remain exposed to the weather, and liable to be broke open and stolen—I am also deprived by these means, of receiving any storage for the same. When boats come down the river in order to ship tobacco, they have to send ten miles to the inspectors, and then perhaps cannot find them; their boats and hands are on expenses, and perhaps the water falls so that they cannot get their tobacco down the river, and thereby sustain considerable loss—It is well known, that a boat once came down, and broke open my ware-house, and the inspectors have ever refused to pay me the storage of the tobacco they took out.
>
> By what I have here cited, the public will see how they are imposed on as well as individuals injured; and myself deprived of having it in my power to obtain a single farthing for the storage of tobacco, flour, hemp &c.
>
> IW: Eli Cleveland.

Mary Verhoeff's (1917) book, *The Kentucky River Navigation*, provided important information concerning early warehouses. She noted that one of the favorable locations for a warehouse was on the land of Eli Cleveland in Fayette County (Verhoeff 1917:72). Verhoeff (1917:72-73) reported that:

> Requests for warehouses were often refused by the legislature although it was represented that those existing were difficult of access to many inhabitants because of bad roads, the precipitous cliffs, the risk and inconvenience of fording the stream and the expense of "ferriage." In 1789, a body of citizens sent a remonstrance asking that the number in a county be limited to two and that the sites be selected by the county courts. It was claimed that numerous petitions for additional ones on the Kentucky were based on "neither justice or good policy" as the population was unable to provide the necessary weights and scales or houses for the desired establishments, a greater number of which would "divide the attention of the people so that they must fail."

Verhoeff's (1917:73-74) also discussed the system of inspection at the warehouses for tobacco, hemp and flour and what was expected under the Kentucky laws:

> The warehouses established at this time are of special interest in that that they mark the introduction into Kentucky of a system of State inspection of commodities intended for foreign markets which was continued for several decades after the separation from Viriginia and was of great importance to river commerce. In the case of tobacco, the warehouse method of marketing is still in vogue and until the day of trusts conferred upon the planters the advantages that accrue to sellers from open competition with buyers. It is at present a characteristic feature of the southern districts. Here each section has its public warehouse situated in the nearest town or city where the methods are practically the same as those employed in the old Virginia establishments save the inspectors are chosen and paid by associations of Warehouse men.
>
> The Kentucky legislature adopted the Virginia system by an act of December 13, 1792. For each "inspection" of tobacco, hemp, or flour, which included one or more warehouses within a county, three inspectors were to be appointed by the governor. Notes, assignable and negotiable, could be issued which were used for the discharge of public and private debts, but these were not legal tender even for tobacco, as a previous act of June 28, 1792, required all court fees to be paid in money, and all fines and forfeitures in tobacco imposed by Virginia laws could be recovered in currency at the rate of a penny a pound of the weed.
>
> The warehouses were required to be self-supporting, and at first the buildings and weights and measures were provided by the owners. In accordance with an act of February 10, 1798, regulating the inspection of tobacco, the proprietor rented the building to the inspectors, and the county court could compel him to keep the house in good condition with sufficient room for storage and to provide scales and weights, funnels, wharves, and other necessary conveniences. The State was responsible for tobacco and warehouse in case of fire.

A three-volume study entitled *The Genealogy of the Cleveland and Cleaveland Families* (Cleveland and Cleveland 1899) included brief information on Eli Cleveland. The authors indicate that Cleveland died in April or May of 1829 at an advanced age between 95 and 100 years and

that his wife died about 1827 (Cleveland and Cleveland 1899:2072). John W. Winn who was raised within half a mile of Eli Cleveland's property, shared that he heard Cleveland preach often (Cleveland and Cleveland 1899:2072). Further, Cleveland and Cleveland (1899:2072) mentioned Eli Cleveland's early mill and warehouse but incorrectly stated he was in Clark County rather than Fayette County:

> An Eli Cleveland built the first mill in Ky. In that part of the country about 100 years ago [1782]. It was on Boone's Creek, Clark co., Ky., and stood there a few years ago. Eli built also a large tobacco house and was wealthy. His farm owned 1883 by the Doderges.

The genealogy study also mentioned the Cleveland brothers service in the Revolutionary War and quoted from Eli Cleveland's will (Cleveland and Cleveland 1899:2072):

> Eli and five brothers were in Revolution, and all at Yorktown surrender. "Likely Eli migrated to Ky. 1786."
>
> County Clerk's Office, Fayette co., Lexington: Will Book I: 223.
>
> I, Eli Cleveland of Fayette co., do make … this my last will. My wish is that my body be decently buried. … I give my brother, James Cleveland, 50 cents, brother Alexander Cleveland 50 cents, brother John Cleveland 50 cents, brother Oliver Cleveland 50 cents, brother William Cleveland 50 cents, each of my sisters 50 cents, as named, Mary Johnson, Annie Hazelrig, Ankey Wood, Elizabeth McWilliams, Milly Henry. I then give and bequeath to Bernard Franklin and his wife Martha, she being a sister of myne [sic, mine], the tract of land I now live on, by survey 624 acres, with all household … furniture to them and their heirs forever, for their services and good will to me, leaving their homes and standing my friend in many cases. I then give all my negroes to George Stapleton of Mo., all my horses, cattle … [etc.] I leave Lochauah Poindexter, Jesse Hutson, and Bernard Franklin, executors. … Witness my hand and seal this 11th Apr. 1829. William Stivers, E. Stivers, P. C. Aubrey, James Johnson, Eli Cleveland. [SEAL] Probated June court 1829, contested to July court, the probated.

Harry Enoch (2009:97), in his discussion of Colonel John Holder's land transactions during April 1780, provided the following comments about Holder's land on Boone Creek and how Eli Cleveland acquired the land:

> Holder did not appear at the land office in April [1780] to enter his settlement and preemption on Boone Creek, since he had by then sold the rights to Alexander Cleveland. Alexander sold the tracts to his brother Eli Cleveland, who later established a ferry, warehouse and gristmill on Boone Creek. The controversial Eli was involved in a suit over the Holder tracts. Another brother, Oliver Cleveland, described in a court deposition what happened [Alexander had to sue his brother Eli to obtain the purchase price].

In their book, *Bluegrass Land & Life*, Mary E. Wharton and Roger W. Barbour (1991:45) used Eli Cleveland as an example of an early entrepreneur in the Bluegrass region:

> So much litigation concerning disputed ownership had been initiated in the 1790s that enterprising young attorneys, such as John Breckinridge and Henry Clay, saw great opportunity for a lucrative law practice in Kentucky. Land litigation in the Bluegrass reached its peak in the early 1800s.
>
> This situation was also an opportunity for entrepreneurs with a bit of ready cash for investment in Kentucky land in the 1780s. One representative example is Eli Cleveland, a Revolutionary War officer who came to the Bluegrass from the Virginia Piedmont about 1782. He was a different times engaged in various projects, including one of the first water mills in Kentucky, a rope walk, a warehouse on the Kentucky River for collecting and inspecting goods to be shipped, and a ferry across the river in partnership with Green Clay of Madison County— "Clay's Ferry," with the Fayette side known as "Cleveland's Landing."

THE MILL OWNERS AND THEIR SLAVES

Eli Cleveland and Jeremiah Rogers were both slave owners and they may have involved enslaved individuals in various jobs at their mills and other businesses. Items from Lexington newspapers, quoted below, related to Cleveland and Rogers ownership of slaves. The earliest item was an ad by Eli Cleveland concerning a runaway slave named Jack that appeared in the April 30, 1791, issue of *The Kentucky Gazette* (1791:1) and ran again on May 7, 1791. This ad provides tremendous details about the clothing worn by Jack:

> **R**UN away the 23d inst. a negro fellow, named Jack, 26 years of age, straight well-made fellow, has on an old black wool hat, coarse hemp linen shirt, his breeches and jacket is of linsey filled with white wool, new yarn stockings which are white, a pair of double soled stich down shoes, has an iron ring on his finger, an impediment in his speech. He run away before and was gone two weeks, was brought home, received no punishment, went off in two days after, he says a friend of his offered to convey him out of the district, it is highly probable some ill-disposed person may have gave him a pass; Any person who delivers to me, shall receive three dollars reward if in this county, if taken out of this county Ten dollars paid be me.
>
> ELI CLEVELAND.
>
> *Fayette, April 27, 1791.*
>
> N.B. Any person that takes him, ought to secure him well or he will get away.

On December 30, 1797, Eli Cleveland published an ad in *The Kentucky Gazette* (1797:3) for the public sale of two slaves. The ad was repeated on January 3, 1797:

Will be Sold at Public Sale,

By the subscriber, in Lexington, on the second Monday in January 1798, for CASH, two likely NEGRO FELLOWS, under good character, and perhaps equal to any in the state—They have had the smallpox, measles, &c. &c. The sale will begin at one o'clock, in the courthouse yard.

ELI CLEVELAND.

December, 1797

Jeremiah Rogers published an ad in the May 5, 1812, edition of *The Kentucky Gazette* (1812:4) offering a twenty-dollar reward for his runaway slave Charles. It is likely that Charles worked in the mill since he was wearing a "miller's hat". The ad is also valuable for the description of the slave and the details about his clothing. The ad was repeated on May 12, 1812, and a different version of the ad appeared on August 11, 1812, and ran until September 9, 1812:

Twenty Dollars Reward.

RAN away from the subscriber on Boone's creek, Fayette county, near Cleveland's landing, on the night of the 20th of April, a likely negro man named

CHARLES,

Yellow complexion---five feet eight inches high, and heavy made, walks irregular, with his toes outward---twenty-two years of age; has lost two or three of his upper jaw teeth---he was dressed in a roundabout drab cloth coat, red waistcoat, white linsey overalls, and a miller's hat. It is probable he will make for the little North Elkhorn. The above reward will be given for his delivery if taken out of the state, if within the state, Ten dollars--- and if taken in the county, Five dollars, and reasonable charges paid.

JEREMIAH ROGERS.

April 21, 1812.

On October 11, 1821, Jeremiah Roger published another ad in *The Kentucky Gazette* (1821:3) offering a fifty-dollar reward for his runaway slave Charles:

Fifty Dollars Reward.

RAN AWAY From the subscriber, living in Fayette county, Ky. a *Negro Man* named *CHARLES*, about 27 years old, 5 feet 10 or 11 inches high, stout built, yellow complexion, lost his left thumb to the first joint, has a large scar on his right breast, occasioned by a cut of a knife, fresh done; very fond of whiskey; he had on a drab frock coat.

I will give the above reward if taken out of the state, or ten dollars if taken within it, and all reasonable charges on the delivery, or having him secured in any jail so that I get him.

JEREMIAH ROGERS.

Sept. 11, 1821-39tf

Jeremiah Roger placed a nearly identical ad for the runaway slave Charles in the November 5, 1821, edition of the *Kentucky Reporter* (1821:1). This version of his ad contained artwork. Since this ad was so similar to the one appearing in *The Kentucky Gazette*, the ad was not reproduced here.

Eli Cleveland and his wife owned a large number of slaves. Cleveland placed a long notice "To the Public" in the August 19, 1823, issue of the *Kentucky Reporter* (1823:4). Cleveland and his wife were deceived and cheated by Levi Hart. The notice cautioned the public not to make any contracts for the slaves involved:

TO THE PUBLIC.

WHEREAS, I understand some years past, one of my wife's heirs, Richard Simpson, said he would have all the negroes owned by me that came by her. I then sent part of them into Missouri and sold them, and all I had here that she owned she claimed. Some more afterwards that I had swapped away, and those that I had swapped for, she also claimed. I immediately sold them and gave bills of sale for the whole of them; but reserved on the back of the bills of sale, that I was to keep them my life and her's, which the bills of sale will shew. I was then told by some of the Attorneys, that my wife's heirs would get all that I had sold, and they pressed me hard and persuaded me to make them over to some friend, and that friend to make them back to me again. I did so, to LEVI HART; but he has not complied with his promise only in part and refuses to do it. I now caution all people not to buy nor contract with him for any of the said negroes in the deed of gift, as his release back to me includes all that had sold; and he nor any body by him will ever get one of them. He deceived my wife by his falsities and deception and told her it was her will and read it to her as such; afterwards when she came to understand how he had deceived her, she then

would make them over to some friend by her own consent; and to satisfy her, I did so, and that friend released them back to me. There was no cause for this to be done but to satisfy her, and if Levi Hart had complied with his contract with me I need not now have been at this trouble, as he never paid one cent for the deed of gift, nor any one for him; it was by his falsities he got it; and the reason why I put this before the public, is to keep anyone from being wronged or deceived, as have understood that he has been offering to sell some of the above said negroes.

ELI CLEVELAND.

August 6, 1823.

THE CLEVELAND-ROGERS MILL IN LEXINGTON NEWSPAPERS

This section presents the ads and news items appearing in Lexington newspapers that mentioned the mills and warehouses initially owned by Eli Cleveland and then Jeremiah Rogers. First, the information about Cleveland's mills is included. Second, the information about Jeremiah Rogers' mills is presented.

Eli Cleveland's Mills

Eli Cleveland's name frequently appeared in early Lexington newspapers. In addition to ads for his mills, he published letters to the editor expressing his opinions and frustrations. He also placed ads for slaves, notices that he had found strayed horses and cattle, and miscellaneous items. This section focuses on his mills on Boone Creek and warehouse on the Kentucky River. The first ad for the Cleveland's hemp mill appeared in the February 16, 1793, issue of *The Kentucky Gazette* which continued running until March 30, 1793 (Kentucky Gazette 1793b:2):

H E M P M I L L.

THE *subscriber informs his friends, and the public that his Hemp mill lately built, is now in compleat [sic] order, and ready to take in hemp for the purpose of milling the same; to be well done and fit for the hackle, for one eighth part of the quantity brought to the mill. One bed is 120 lbs. and can be delivered in one hour and a half after the same is put in; one waggon [sic] load can be done in two days. Those who may favor the said mill with their custom, will find their business executed with care and dispatch, by*

Eli Cleveland

N. B. Hemp not to be brought twisted.

Feb. 6, 1793.

About two years later, Cleveland advertised flour for sale from his mill in the April 25, 1795, issue of *The Kentucky Gazette* (Kentucky Gazette 1795:4):

Any person who wants to purchase

F L O U R

BY THE BARREL,

May be supplied by applying to me.

THE Flour is equal to any in this State. I will deliver the same at my landing at Four Dollars and a half per Barrel, or at Frankfort at Four Dollars and three fourths per barrel. ---They may have one hundred barrels on short notice.

Eli Cleveland.

April 18.

The following year on April 9, 1796, Eli Cleveland addressed a letter to Mr. Bradford, editor of *The Kentucky Gazette*, about his mills burning (Kentucky Gazette 1796a:3)

March 28, 1796.

Mr. BRADFORD:

MY Mills were burnt last night, and most confidently have been done by some of my enemies, as there was no fire in the place nor anywhere near; and as I have received private injuries of that kind, &c., before, and their malice is still raging, I think that it will be useless for me to attempt to rebuild them. I therefore purpose to sell 400 acres of LAND to include said mills; ware, and other houses, boatyard and ferry, meadow, peach and apple orchards, &c. The land is well timbered with oak, and poplar, a great part first rate and lies well for cultivation--the landing is most convenient, perhaps, of any on the Kentucky, both for boatbuilding and ware-houses--there is two good warehouses at present, with a house for weighing; also scales, &c. The under part of the millhouse and dam remain unburnt. The mills may be rebuilt with half the expense or less than they formerly cost--it is about one mile from the mills to the river, and in high water boats may come up to the mills, they stand on Boon's creek near the

mouth, which is equal to any stream in this part of the country, and about twelve miles from Lexington. The way to the river is equal to any on the Kentucky. --The title to the land is indisputable. Any person wanting to purchase may apply to the subscriber on the premises, for terms, &c.

ELI CLEVELAND.

A week later, on April 16, 1796, Cleveland published a second letter in *The Kentucky Gazette* about his enemies burning his mills (Kentucky Gazette 1796b:1):

April 4, 1796.

Mr. BRADFORD:

WHEREAS there are divers reports propagated by my enemies, concerning the burning of my mills--it appears from their behavior and language, that they would willingly make the public believe, that some innocent person was the cause, and have gone so far as to say I burnt them myself; which reports are intended to cloak their own villainy--some of them, have so far declared their malice against me, as to wish I had been burnt with them-- this can be proven. I take this method through the channel of your paper, to inform the public of the circumstances of their being burnt--They were burnt on the 27 of March in the night, just before the moon had risen. --I am able to prove there was not the least spark of fire anywhere about them that evening. There were three tracks of persons discovered by a young man who lived at my mills; they came a private way down the mill dam--they had about twenty or thirty yards to wade up to the side of the dam, where the water was waist deep--the tracks came and went the same way. No person ever attempted to pass that way from the first railing of the dam, unless the water was too low that the mill could not grind--which was very seldom. There was the print of the breech of a gun to be seen very plain in the mud, where it is supposed they pulled off their shoes to wade. The young man sent me word concerning the discovery he had made--upon which I took some persons with me, and we found everything as above related. One of the tracks appears to be a boy's of about fifteen years old, and his feet bare--the other two were men; and had shoes on--they came and went the same course the tracks went, when my hemp was formerly burnt.

My mills were judged to be worth three thousand pounds--nay, I was offered that money for them and one acre of land they stood on. I lost about two hundred pounds worth of grain, flower [sic, flour] and hemp in them, &c. &c. &c.

ELI CLEVELAND.

After the malicious vandalism occurring at his mills, Cleveland offered his mills and 400 acres of land for sale in the June 25, 1796, edition of *The Kentucky Gazette* which continued running until July 16, 1796 (Kentucky Gazette 1796c:3):

F O R S A L E,

FOUR HUNDRED ACRES

L A N D:

INCLUDING MY MILLS

Ware-houses, Ferry, Boatyard, Orchards, Meadows, &c. Great part of the land is first rate--there is belonging to the mills about two thousand weight of wrought iron proper for the merchant business--the walls of the lower story of the mill-house is sound, and as high as the mill-bulk[?]-the waterwheels have received little or no damage by the fire; and cogs and rounds well seasoned are ready--the race is planked at the bottom &c. walled with stone on both sides, and the dam perhaps the best in the state, and the stream equal to any. The sawmill is now running and in good order, and the water may be put to the grist mill wheels any minute-the grist mills may be set to running in four week. Beam, chains and scales well ironed for the purpose of weighing tobacco; and beam, chains, weights & iron for the scales, for weighing flour. Boats may come up from the river to the mills in high water--the whole beautifully situated for merchant business, at the mouth of Boon's creek; and may be inclosed [sic, enclosed] with about 3000 panels of fence. Waggons [sic] may pass to and from the landing with such loads as can be carried on any other road.

As I am determined to sell, I will give a credit of one or two years forr [sic, for] the greatest part of the purchase money, and in it I cannot get the value, will take the best price offered, and make an indisputable title. For terms apply to the subscriber near the premises.

ELI CLEVELAND.

June 22, 1796

Jeremiah Rogers' Mills

Thirteen years later, on May 5, 1809, Jeremiah Rogers placed an ad in *The Kentucky Gazette* (1809:4) seeking to employ a miller for his mill on Boone Creek. Apparently, Rogers was experiencing difficulties in finding a suitable miller since his ad continued running until September 12, 1809:

I WANT to employ a Miller who

understands Merchant and Country work and also can manage a sawmill occasionally. To such a man who can come well recommended, good wages will be given, and constant employ, at my mills on Boon's Creek, Fayette county.

Jeremiah Rogers.

Feby. 16, 1809.

Harry Enoch (2002:165) uncovered some pertinent information from *Fayette County Order Book, Number 2* about Rogers Mill:

> In 1811, Jeremiah Rogers petitioned the court for a gristmill on Boone Creek, which suggests that the mill had gone out of operation for a period or that Rogers wanted to move or enlarge his dam or add another mill to his complex. Fayette County Order Book 2:388.

The May 9, 1812, issue of *The Reporter* (1812:3) carried an ad titled "A Very Valuable Farm For Sale". The significance of this ad was that it mentioned the Rogers' Mill as being three miles away, the Grimes Mill two miles away and M'Call's Mill one-half a mile away.

Beginning in mid-1819, Jeremiah Rogers began running a series of ads for lumber sawed at his mill. The first of these ads appeared in the July 7, 1819, edition of *the Kentucky Reporter* (1819:1):

PLANK.

90,000 FEET of Pine, Poplar, and Cherry Plank.

For Sale at Cleveland's Landing.

Apply to JEREMIAH ROGERS.

June 26

Later in the month, on July 30, 1819, Rogers ran the following ad in *The Kentucky Gazette* (1819:4) for planks:

PLANK.

90,000 FEET of PINE, POPLAR and CHERRY PLANK, for sale at Cleveland's Landing. Apply to

JEREMIAH ROGERS.

July 1-27. 4t

The final ad for Roger's planks appeared in the April 21, 1820, edition of *The Kentucky Gazette* (1820:1):

PLANK.

300,000 FEET of PINE, POPLAR, CHERRY and WALNUT PLANK, for sale at Cleveland's Landing. This plank has been sawed one, two and three years. Apply to

JEREMIAH ROGERS.

March 30, 1820-13tf

Initially, Rogers was offering lumber made from pine, poplar and cherry logs. Later, he continued selling pine, poplar and cherry but also added walnut lumber. Pine will grow in the Bluegrass region but is predominantly a species occurring in Eastern Kentucky. Thus, Rogers may have purchased pine logs that were floated down the Kentucky River to his mill or shipped on flat boats as finished planks to be resold. The poplar, cherry and walnut trees were readily available from nearby forests.

THE ARCHAEOLOGICAL REMAINS OF THE CLEVELAND-ROGERS MILL

O'Malley, Amos and Snyder (1991) noted that the Rogers Mill site (15FA217) occupied an area of approximately 14 by 14 meters. The survey form included a nice sketch map showing the Rogers Mill remains and a cabin located to the south. The detailed sketch map showed Boone Creek, the surviving stone walls and depressions associated with the mill. Unfortunately, the length, width or heights of individual walls were not recorded on the survey form. Likewise, the arch at the end of the foundation was not described. A proof sheet with 21 photographs was attached to the survey form, many of the photographs were of an old structure nearby.

On April 2, 2018, I spent about 2 hours and 17 minutes at the mill site. Dan Isenstein and Landon Salle helped me take measurements of the different walls and features at the mill site (Hockensmith 2018). Several years later, Dan Isenstein (2021) published his book entitled *Tales From the Kentucky Hemp Highway*. Dan included a section titled "Eli Cleveland's Industrial Site on Boone Creek" which included two photographs of the mill ruins taken during our 2018 field trip (Isenstein 2021:55-58). The mill ruins are located on the floodplain of Boone Creek, about 12 meters east of the hill base, where an old roadbed (Figure 4) reaches the floodplain. Undoubtedly, this old road provided access to the mill from Richmond Road and was used by patrons doing business with the mill. A sketch planview map was prepared by the author of all visible mill remains with measurements of the walls and other features noted. Using these drawings and measurements, a scaled map was prepared on graph paper (Figure 5). At the south end of the mill complex was a poorly defined limestone wall (A) extending 19 meters east-west. At the west end of Wall A was a rubble pile (Figure 6) at the corner measuring ca. 4 meters east-west, 2.5 meters north-south, and 80 cm high. A major wall (B), parallel to Wall A, was located 13.7 meters further north. This wall (Figure 7) forms the northern wall of the main mill complex. Twelve courses of horizontal limestone slabs were visible in the south side of this wall which measured 20 meters long (east-west) and 95 cm wide (north-south). A limestone arch (Figure 8) was built into this wall, about 13.3 meters from the west corner of the wall. The arch was formed by 15 shaped arch stones (Figure 9). The key stone at the top measured 36 cm long, 16 cm wide at the top, and 12.5 cm wide at the bottom. Overall, the arch was 1.67 meters high and 1.7 meters wide. Before the millrace was partially filled in, the arch would have been higher. The wall thickness on the east of the arch was 97 cm while the wall thickness on the west side ranged from 90 cm to 1.40 meters. There were projections (Figure 10) built into the wall on the south side of the wall, on the west side of the arch. These projection were 55 cm long, 87 cm wide, and may be associated with a water control gate in the millrace. Arches are very common on old mill foundations where water entered and exited mills along the millraces.

The west wall (C) of the main mill foundation (Figure 11) was about 13.7 meters long (north-south). The interior slope of the inside (east side) of this wall was covered with limestone rubble. A parallel wall (D) was located about 13.3 meters east of Wall C. This wall was on the west side of the arch in Wall B and forms the west wall of the millrace inside the mill structure. Between Walls C and D there was a depression about 1.5 meters deep. This low wall was 9 meters long (north-south), 50 cm high, and 75 cm to 1 meter in width. The remnants of the eastern millrace wall (E) was 1.8 meters east of Wall D. About 3.8 meters of Wall E (north-south) survives as a rubble pile about 50 cm high. Another nearly buried wall (F) is situated ca. 3 meters further east and appears to be the eastern wall of the main mill. Wall F is 9.6 meters long (north-south) and was of an unknown width and height since this wall was mostly buried under silt. Wall G extends on the north side of Wall B (Figure 12) for 6.15 meters (north-south), was 1.75 cm high with 11 course of limestone slabs exposed. There was a ca. 2 meters deep depression on the north side of Wall B that was 19 meters long and ca. 3.2 meters wide (east-west). This appears to be the main head millrace that transported water from the dam into the main mill foundation. Immediately west of the millrace was a steep bank, 2-3 meters wide, covered in limestone rubble, and was 24 meters long (north-south). A flat area, west of the slope containing rubble, extended for 19 meters westward to the base of the hill.

Just north and east of the main mill foundation was a large rectangular stone platform (Figure 13) type foundation (H) that may be associated with the abutment for the dam or a specialized foundation. The west wall was 6.95 meters long while the east wall was 6.6 meters long. The north wall was 4 meters wide, and the south wall was 4.1 meters wide. This foundation was 1.45 meters high. Foundation H may be associated with the dam abutment or could be the foundation for one of the mills in the complex. On the west side of Foundation H was a 3.2 meters wide millrace extending westward. There was a 1.3 meters wide opening (Figure 14) between foundation H and Wall G. At the southeast corner of the large platform foundation, there was a buried wall (I) barely visible (Figure 15) that was 16 meters long (east-west) which extended to the edge of Boone Creek. The buried wall was ca. 3.6 meters wide and may be the reinforced land portion of the mill dam. Large rocks were exposed at the water's edge at the east end of Wall I (Figure 16).

Most likely, the mill dam was located directly east of the stone platform type foundation. On the opposite bank of Boone Creek, there is a low limestone cliff that is nearly vertical. In alignment for the dam site are two horizontal openings (about 12 by 12 inches each) in the cliff wall. These openings may have held heavy timbers in place to anchor a timber crib type dam. Also, holes may have been drilled in the bedrock and heavy iron pins inserted through the lower logs into the bedrock. Because of recent rains, the water level in Boone Creek was higher than usual and it was not feasible to cross the creek to examine these openings. Boone Creek at the dam site was estimated to be about 10 meters wide. A typical timber crib dam would have consisted of log cabin-like compartments that were filled with limestone slabs to weigh the dam down. Wide boards may have been nailed to the upper side of the dam to help make it more watertight.

Above the mill foundations, there was a shallow depression about 3 meters wide, 50 meters long, and 40-50 cm deep in the center. This may be the old millrace that has silted in. The small size of the trees growing on the terrace above the mill suggest that this area was an open field perhaps 15 to 20 years ago. If this was cultivated for row crops, the previous owners may have partially filled in the old millrace to level the ground. Also, flooding over 200 years could have partially filled the millrace with silt.

Figure 4. Base of the old road leading to the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing west. Photograph taken by Charles D. Hockensmith on April 2, 2018.

The area south of the main mill foundation was only a short distance away from another property owner's line. Thus, this area was not carefully searched since we did not have permission to access this property. Like the area north of the mill, it is assumed that the tailrace leaving the mill has been obscured by flooding and the deposition of silt over 200 years.

DISCUSSION

This section is divided into two parts. First, information is provided on the other mills that once operated along the course of Boone Creek. Also, some thoughts are provided about the possible appearance and type of construction used for the Cleveland-Rogers Mill. Second, brief discussions are presented that discuss how wheat, logs, and hemp may have been processed at the Cleveland-Rogers Mill.

Former Mills Along Boone Creek

The Cleveland-Rogers Mill was one of several mills located along Boone Creek. Other mills once operating along Boone Creek included Pettit's Mill, Grimes Mill, McCall's Mill, and Rogers Mill (O'Malley 1991a:3-4). Winn's Mill was located on Boggs Fork, one of the tributary streams of Boone Creek (O'Malley 1991b:36). Of the known mills along Boone Creek, only Grimes Mill has been studied in detail by Harry Enoch (2002) in his book *Grimes Mill: Kentucky Landmark on*

Boone Creek, Fayette County. On the Rogers Mill survey form, O'Malley, Amos, and Snyder (1991:7) made the following observations about the mill and its competition with other early mill in the drainage system:

> This site was one of the earliest mills on Boone Creek and its establishments paved the way for industrial development to move upstream. Although its location was not easily accessible from Richmond Road and inaccessible from the Clark County side, its strategic location near the Kentucky River helped to prolong its operating life. However, once other mills such as Grimes and Pettitt were established, Rogers Mill lost the advantage of being the only one in the area and its locational drawbacks worked against its continued operation.

Grimes Mill and Pettit's Mill mentioned by O'Malley, Amos, and Snyder (1991:7) are the only mills that are still standing in the drainage area. Both mills are located further up (to the north) Boone Creek from the Cleveland-Rogers Mill. Grimes Mill is ca. 2.15 km north of the Cleveland-Rogers Mill and is currently home of the Iroquois Hunt Club. Grimes Mill and Pettit's Mill are both substantial structures constructed from quarried limestone blocks. The two and a half story Grimes Mill (Figure 17) was built by Charles Grimes in 1807 from land purchased from Eli Cleveland in 1805 and continued operating until 1928 (Enoch 2002:12-19). The only remaining piece of equipment in Grimes Mill is an overshot 16 ½ foot steel Fitz waterwheel still intact in the basement (Enoch 2002:38, 45). Enoch's (2002:48) map entitled "Grimes Mill Neighborhood Roads 1808-1809" shows John McCalls Mill on Boggs Fork, a tributary of Boone Creek, E. Francis Mill and William McCalls Mill (both on Boone Creek) being situated north of Grimes Mill. Other early grist mills along Boone Creek included Charles Morgan's Mill, William Robinson's Mill, and Hazelrigg's Mill (Enoch 2002:54-55).

Pettit's Mill (Figure 18) is ca. 1.7 km north of Grimes Mill and is currently part of the Blue Grass Christian Camp campus. According to Enoch (2002:56), Pettit's Mill (also known as Morton's Mill and Gentry's Old Mill) is very similar in appearance to Grimes Mill and is north of the Athens-Boonesboro Road bridge. The equipment has been removed from the mill. A pair of French Burr Millstones are on display on the front porch of Pettit's Mill. An ad appearing in the February 19, 1868, issue of *The Kentucky Gazette* (1868:2) offered the Marble Mills (better known as Pettit's Mill) for Public Sale along with 191 acres of land on March 12, 1868. Located 1.5 miles from Athens, the 3 ½ story mill, constructed of "marble stone" (high quality limestone blocks), was powered by a waterwheel (The Kentucky Gazette 1868:2). Three pairs of French Burr millstones were used for grinding wheat (The Kentucky Gazette 1868:2). During the dry season, a 36 horse-power steam engine provided power to operate the mill (The Kentucky Gazette 1868:2).

There are no known images of the Cleveland-Rogers Mill when it was standing. From the surviving foundations, it is obvious that the construction was inferior to that of Grimes Mill and Pettit's Mill. Both of these mills were built from large blocks of quarried Tyrone Limestone. They were also constructed several years later than the Cleveland-Rogers Mill. In contrast, the Cleveland-Rogers Mill foundations were constructed from common limestone slabs of various sizes, probably collected along the Boone Creek. Most likely the first floor was constructed from limestone slabs while the second and third floors (if present) were of timber frame construction.

This would explain the comment in Eli Cleveland's letter of April 9, 1796, in *The Kentucky Gazette* (1796a:3): "…The under part of the millhouse and dam remain unburnt." Also, the June 25, 1796, ad in *The Kentucky Gazette* (1796c:3): "…the walls of the lower story of the millhouse is sound, and as high as the mill-bulk[?]-the waterwheels have received little or no damage by the fire; and cogs and rounds well-seasoned are ready…" These comments by Cleveland suggest, as noted above, that the first story of the mill was constructed of stone and the story/stories above were built of wood which received damage from the fire. Since the waterwheels were not damaged, they may have been located inside the first floor and thus protected by the stone walls. Because more than one waterwheel (at least two and perhaps more) was mentioned, it is likely that separate waterwheels were used to power equipment used for hemp, flour, and lumber. Water backed up behind the dam (assumed to be a log crib structure), flowed into the upper millrace and then under the floor of the first story of the mill. It is possible that small overshot waterwheels or breast wheels could have been used at the mill, provided that wheel pits were excavated, and wooden flumes used to convey water to the waterwheels. We know that the millrace was lined with planks on the bottom and that stone walls on both sides of the race according to the June 25, 1796, edition of *The Kentucky Gazette* (1796c:3). If the section of the millrace inside the structure was also lined with planks, undershot waterwheels could have been used, the water turning the wheels as it flowed along. Two or more undershot waterwheels could have been used to power the equipment in different areas of the mill complex. Archaeological excavations along the course of the old millrace may be able to uncover evidence for the type of waterwheels used.

Processing Wheat, Logs, and Hemp

For the benefit of the reader, brief discussions are provided about the processes used for converting hemp into usable fibers, wheat into flour, corn into corn meal, and trees into lumber. The following paragraphs will discuss these different types of mills.

Both the grinding of wheat and corn involved nearly identical processes. Large disk-shaped millstones were used in pairs. The lower millstone remained stationary and was called the bedstone. The upper millstone (the runner stone) was suspended above the bedstone and connected to the power source by a vertical iron shaft. Both millstones had a pattern of furrows (grooves) cut into the grinding face. As the upper millstone turned at a rapid rate, the wheat or corn was ground between the two stones. The distance between the millstones could be adjusted by the miller. A wooden housing covered the millstones that had a spout on one side to remove the flour. Grain was fed into the eye (central hole) of the upper millstone or fed from a wooden hopper suspended above the millstones. Typically, millstones made from a different type of stone were used for grinding wheat and corn. Larger mills had several pairs of millstones to produce larger quantities of flour and corn meal.

The Cleveland-Rogers' flour mill was most likely using French Buhr millstones, made from a porous type of flint, that were preferred for grinding wheat. Typically, locally made Kentucky millstones were used for grinding corn. The French Buhr millstones quarried at La Ferté-sous-

Jouarre, France, were shipped to the United States in large quantities (Ward 1993). Millers consider the French millstones as being superior for grind wheat. These millstones were being advertised in Lexington as early as 1792 (Hockensmith 2008). Initially, the French millstones were made from one large piece of stone (monolithic millstones) and later were manufactured from several carefully shaped pieces cemented together and bound with iron bands (composite millstones). The most famous Kentucky millstones were known as “Red River stones” because they were quarried in the general vicinity of the Red River, a tributary of the Kentucky River. Red River millstones were made from a grayish brown conglomerate, a sandstone with rounded quartz pebbles, associated with an ancient river channel. They were manufactured at quarries in the knob’s region of present-day Powell County, Kentucky between the 1790s and ca. the 1870s. The author documented six conglomerate millstone quarries in Powell County in his book The

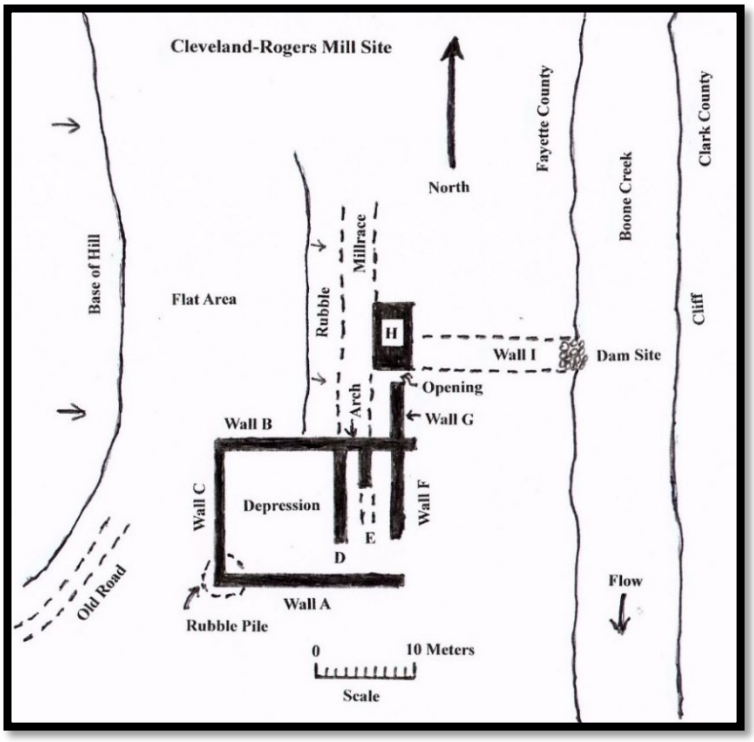

Figure 5. Scaled sketch map of the archaeological remains associated with the Cleveland-Rogers Mill in Fayette County, Kentucky.

Figure 6. Rubble pile at the intersection of Walls A and C at the Cleveland-Rogers Mill in Fayette County, Kentucky. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 7. Wall B with the Arch facing north at the Cleveland-Rogers Mill in Fayette County, Kentucky. Photograph taken by Charles D. Hockensmith on April 2, 2018.

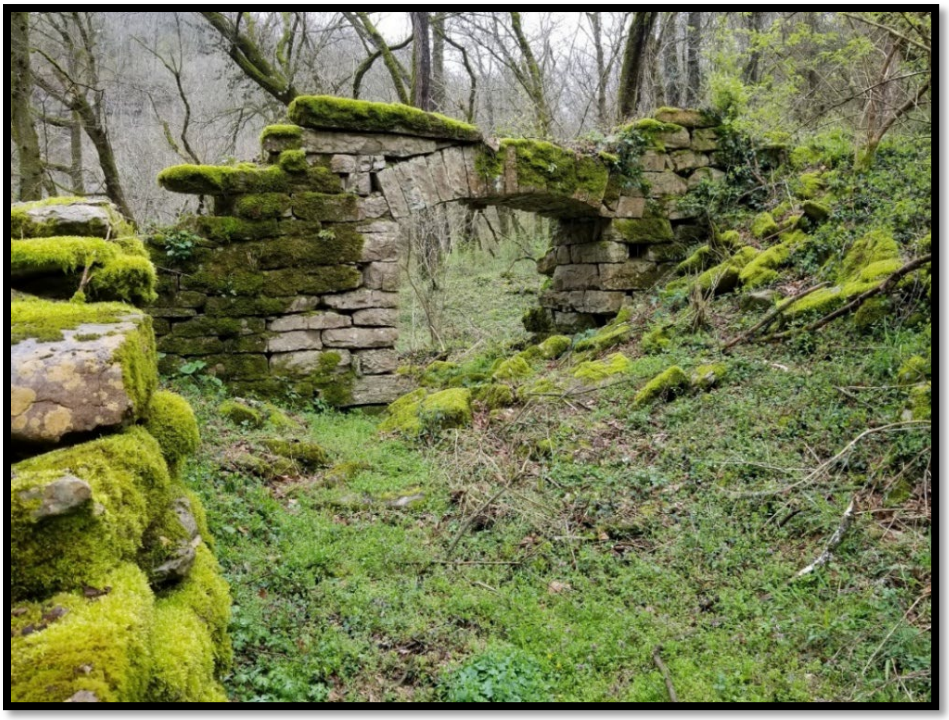

Figure 8. The north side of the Arch in Wall B at the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing south. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 9. Closeup of the Arch in Wall B looking north at the Cleveland-Rogers Mill in Fayette County, Kentucky. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 10. Slabs projecting from the lower side of the arch at the Cleveland-Rogers Mill in Fayette County, Kentucky. Photograph taken by Charles D. Hockensmith on April 2, 2018

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Figure 11. The rubble of Wall C (in the background) and the base of Wall A (to the left) at the Cleveland-Rogers Mill in Fayette County, Kentucky. The depression is located inside the mill foundation. Facing west. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 12. Wall G (left) and Arch in Wall B (center) with millrace at the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing south. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 13. North end of Foundation H and upper end of the millrace facing the Arch at the Cleveland-Rogers Mill in Fayette County, Kentucky. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 14. Opening between the south end of Foundation H (left) and the north end of Wall G (right) at the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing East. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 15. Top of buried Wall I at the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing east with Boone Creek at the top. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 16. Exposed stones in the portion of Wall I adjacent to Boone Creek at the Cleveland-Rogers Mill in Fayette County, Kentucky. Facing northeast. Photograph taken by Charles D. Hockensmith on April 2, 2018.

Figure 17. Grimes Mill on Boone Creek in Fayette County, Kentucky. Photograph by Charles D. Hockensmith.

Figure 18. Pettit's Mill on Boone Creek in Fayette County, Kentucky. Photograph by Charles D. Hockensmith.

Millstone Quarries of Powell County, Kentucky (Hockensmith 2009a). These stones were used by many millers for grinding corn kernels into meal. Other types of millstones were also used in early mills in the Blue Grass Region. Large monolithic limestone millstones (Hockensmith 2009b:86) were used at some early central Kentucky mills. Limestone was typically too soft to hold up to frequent grinding (there were some harder types of limestone) but were sometimes used when better millstones were unavailable. Millstones made from flint were also used in early mills. In reality, these so-called flint millstones were made from limestone deposits containing both nodular and tabular inclusions of flint. These millstones were made at Jeremiah Buckley's Millstone Quarry at Buckley's Ferry in present day Anderson County, Kentucky and at John Tanner's Millstone Quarry in Woodford County, Kentucky (Hockensmith 2009b:66-68; Hockensmith 2019:263-268). Buckley was manufacturing a variety of millstone sizes ranging from 2 ½ feet in diameter to 5 feet in diameter. Both millstone quarries were located near the Kentucky River and millstones could have been easily transported up and down the river on flat boats. The Tanner Millstone Quarry was documented by the author and colleagues (Hockensmith, O'Dell, and Hannibal 2019) while the Buckley's Millstone Quarry has still not been located.

Early sawmills used waterpower, connected through gearing, to operate a vertical saw blade with pointed teeth. These blades moved up and down to cut through logs. The logs were rolled onto a metal carriage with gearing that slowly pushed the logs against the blade. After the first board was removed, the log was repositioned on the carriage and the process repeated. The

outer cuts produced slabs rounded one side which were not used for lumber. The interior of the log produced all the useful boards. After all the boards were cut from a log, a new log was loaded onto the carriage and the entire process repeated. Most sawmills had open sides to facilitate the movement of logs onto the carriage and the removal of the boards. The sawmill roof was usually supported by a series of vertical posts. Long horizontal posts were laid adjacent to one side of the sawmill creating a sloping platform where logs could be rolled onto the mill floor. Level areas near the sawmill were utilized for stacking the boards where they could dry and season.

In a chapter entitled "Manufactures of Wood", Victor S. Clark (1949) in his book *History of Manufacturers in the United States*, Volume III discussed technical developments in American sawmills. After discussing the waste of wood during the sawing of boards, Clark (1949:240) made the following remarks about different types of saws:

> … Indeed, sawing waste probably increased for a time in this country, a result of mechanical improvements looking primarily to speed and high output. The old sash saw of colonial days, and also the lighter and faster moving muley saw that succeeded it about the middle of the last century, were fixed at both end and made an even cut. But the circular saw which followed them, while it ran about ten times as fast as a muley saw, or at a rate of from 6,000 to 9,000 feet a minute, was fixed only at the center and therefore wobbled and made a wide cut in the log. …

Given the early date of Eli Cleveland's sawmill, it is assumed that it was relatively primitive. It probably used an old sash saw and may have been upgraded to a muley saw by the later years of Jeremiah Rogers' ownership. The log carriage was undoubtedly primitive as well. This would have been the least substantial of the mill structures in the complex. Probably just consisting of a roof over the saw and carriage with open sides.

Eli Cleveland's ads indicated that he shipped his flour down the Kentucky River in barrels. Given the isolated area where Cleveland's mill was situated, it would not have been feasible to acquire barrels from other manufacturers. Most likely, Cleveland had one or more employees or possibly slaves that worked as coopers and made the needed barrels. Since the mill complex included a sawmill, narrow boards could be produced for the barrel staves. His coppers could then shaped the staves and assemble them into barrels.

Hemp was a very important crop during the early years of Kentucky's history. Mills were used to process the long stalks of hemp. Perhaps the best reference to this industry is James F. Hopkins' (1951, 1998) book *A History of the Hemp Industry in Kentucky*. A recent overview of the industry is contained within Dan Isenstein's (2021) book *Tales From the Kentucky Hemp Highway*. The fiber derived from hemp plants was very important for the production of rope, cordage, bagging, etc. Hopkins (1951:59) provided a brief description of a hemp mill:

> … One contrivance, called a "hemp mill," was a modification of an apparatus used in breaking flax. It consisted of a circular platform, whose radii were small logs or hardwood timbers edged on top, upon which revolved a large, fluted log or a millstone, "cut in the form of a circular cone," whose horizontal axle was fastened at one end of a vertical shaft standing in the center of

the platform. The heavy roller, when turned by horsepower around the center shaft, broke the hemp which had been placed in thin layers on the platform; and the shives, or fragments of wood, fell through the spaces between the logs to the ground underneath. …

A number of these cone-shaped millstones have survived in the Blue Grass Region. The presence of these millstones suggests that this was once an important method for processing hemp fibers. I am in the process of documenting cone-shaped millstones and preparing an article about them. Apparently, these millstones were used in a much larger geographical area where the hemp industry once existed. I have documented examples of these cone-shaped millstones in Pennsylvania and Virginia. Undoubtedly, they are present in other states as well.

CONCLUSIONS

Eli Cleveland played a major role in the industrial development of the Boone Creek area of Fayette County, Kentucky. In addition to his flour mill, sawmill, and hemp mill, Cleveland owned a boat yard, two warehouses, and a ferry crossing on the Kentucky River. His mills were reportedly one mile from the Kentucky River and could be reached by boats by coming up Boone Creek during high water. However, the modern 7. 5 Minute USGS topographic map suggests the mills were actually less than half a mile from the river. O'Malley (1991b:33) stated that "Cleveland was an entrepreneur par excellence, who rather ruthlessly pursued a variety of business enterprises." Obviously, Cleveland made enemies as he built his industrial complex near the mouth of Boone Creek. Some of these enemies tried to harm him by burning his flour mill. One of his letters also suggests that he had prior incidents from his adversaries. From Cleveland's letters and ads, we learn that the lower story of the flour mill, the waterwheels, and dam survived the fire. The mill race appears to have been very substantial with stone walls on both sides and planks lining the race's bottom. Cleveland was selling his flour in 1795 for $4.50 per barrel at his landing and for $4.75 per barrel in Frankfort. Flour could easily be shipped to Frankfort on flatboats traveling down the Kentucky River. Cleveland's sawmill was described as in good running order in 1796. The hemp mill was not specifically mentioned in the ad. It is suspected that Cleveland, a large slave owner, probably used slave labor in his various businesses.

Jeremiah Rogers, a well-to-do entrepreneur acquired Cleveland's mills in 1801 with his father Joseph and quickly became the sole owner of the business. Like his predecessor, Rogers was a slave owner and undoubtedly used slave labor to operate his businesses. The newspaper ads for Rogers' early years are exclusively for lumber. The flour and hemp mills were not mentioned but Rogers may have relied on word-of-mouth advertising given the mill's long history. Following Jeremiah Rogers' death in 1836, his son took over the mill. We don't know how long the mill was active but Enoch (2002:174) reported that "Rogers Mill burned in the 1860s and was not reopened."

Additional research remains to be conducted for the Cleveland-Rogers Mill. It is possible that the Fayette County Manufacturing schedules for U. S. Censuses 1820, 1850, and 1860 might list the mill. Since these records are only available on microfilm, time was not available to consult

them. Hopefully, a future researcher will check these Manufacturing Census schedules. Another possible source of information is the early Fayette County Order Books that may mention the mill. The archaeological remains associated with the Cleveland-Rogers Mill hold great potential to answer questions about the mills. The buried portions of the mill foundations may contain clues about the uses of the various portions of the complex. We know that equipment was used for grinding wheat, processing hemp, and sawing lumber. At this point, we have no idea how the mill complex was organized. Hopefully, archaeological excavations could uncover clues about these activities and provide new insight into the activities occurring at the mill complex. Since the mill burned after 1860, there may be artifacts associated with the different processing activities (various iron machine parts, millstones, etc.) that collapsed into the lower level of the mill. Test excavations in the millrace, especially inside the mill foundations may uncover remains of water control gates, surviving metal portions of the water wheels, the plank flooring on the bottom of the race, and various artifacts that fell into the race and foundation when the mill burned. During a period of dry weather, the bed of Boone Creek could be inspected for submerged logs associated with the dam base, drill holes in bedrock, and vertical iron pins used to secure the log dam. Further, the cliff face, across Boone Creek, could be inspected to confirm whether the horizontal rectangular openings observed in the rock face, from a distance, are actually chiseled out depressions used to anchor timbers in the dam.

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