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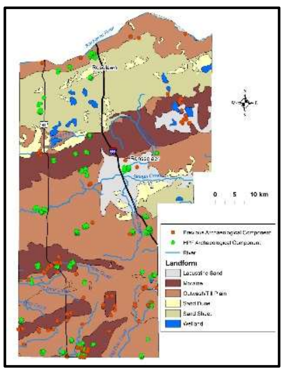

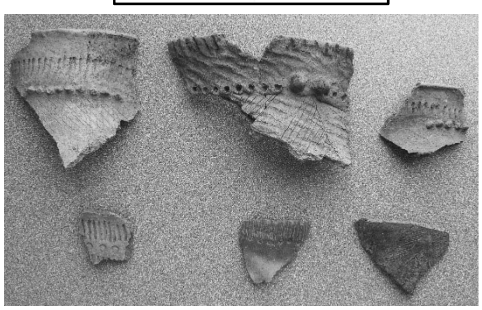

INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF HISTORIC PRESERVATION AND ARCHAEOLOGY (DHPA)

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Cover design: The images which are featured on the cover are from the articles included in this journal.

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Mission Statement: The Division of Historic Preservation and Archaeology promotes the conservation of Indiana's cultural resources through public education efforts, financial incentives including several grant and tax credit programs, and the administration of state and federally mandated legislation.

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Note: Some of the projects discussed, noted below with "HPF," received federal financial assistance from the Historic Preservation Fund Program for the identification, protection, and/or rehabilitation of historic properties and cultural resources in the State of Indiana.

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This is a refereed, open access journal. All articles and reports/features are reviewed by the Editor, the DHPA Director, and two professional archaeologists not with the DHPA. The HPF submissions were also reviewed by one of the other DHPA archaeologists in their capacity as the HPF archaeology grant liaison. Dr. Jones reviewed several articles.

INTRODUCTION

Last year was challenging with the pandemic occurring, transitions to remote work, and more. We did not produce a journal during 2020, but the DHPA is pleased to once again present a volume of the journal. Included is an interesting mix of articles regarding both precontact and historical archaeology in our state.

Per state statute (Indiana Code 14-21-1-12), one of the duties of the DHPA is to develop a program of archaeological research and development, including the publication of information regarding archaeological resources in the state. This journal is one of the ways that our office continues to address that mandate. Also, Indiana Code 14-21-1-13 states that the Division may conduct a program of education in archaeology. Indiana's cultural resources management plans have also listed educating the public about Indiana's Native American cultures and identifying, and studying Native American, African American, and other ethnic and cultural heritage resources, as ways to accomplish several preservation goals. The variety of archaeological sites in Indiana, and what has been learned about the sites, is wide-ranging and impressive.

For those who may not be familiar with some archaeological terms, a helpful glossary of some of these general terms is included in the back of this journal. To also aid the non-archaeologist reader, a general overview of precontact time periods may be found at the end of this volume. Additional archaeological outreach documents, including *Early Peoples of Indiana* and previous volumes of *Indiana Archaeology*, may be accessed at http://www.in.gov/dnr/historic/3676.htm.

- I thank our colleagues who contributed peer reviews for this volume of the journal.
- The authors are thanked for their submissions.

—ALJ

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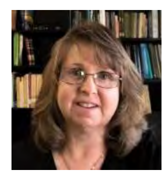

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USING TREE-RING ANALYSIS TO ESTABLISH BUILD DATES FOR THE HUDDLESTON FARMSTEAD, WAYNE COUNTY, INDIANA (12WY429)

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INTRODUCTION

The rich history of Indiana's early public transportation projects includes the construction of canals, bridges, local roads, and regional highways. Key to the early development of the state was the construction of the 156-mile (251-km) section of the National Road from the Ohio border in Wayne County, Indiana, to the Illinois border in Vigo County, Indiana. Construction of the road in Indiana began in 1829, and the last funding for the Indiana section was appropriated in 1838 (The Indiana National Road Association 1997).

Currently, the National Road is a scenic byway connecting cultural resources across the state. The interpretation of historical sites, following their conversion into museums and tourist destinations, often have conflicting dates or lack clear dates for the significant events that define the resource. Archaeologists, historians, and preservationists rely upon a variety of methods to accurately date and interpret the creation and evolution of historic sites including the analysis of archival sources or artifacts. Another method for establishing the dates for historic sites is dendrochronology.

Dendrochronology, or tree-ring science, allows for precise dating of past events (Speer 2010). A subfield of dendrochronology is dendroarchaeology which focuses on using tree rings to date historically constructed artifacts like landscapes and buildings. In Indiana, tree-ring analysis has proven to be a very useful technique to determine the precise construction date of historical sites. For instance, buildings such as houses and barns, or landscapes such as farmsteads and canals, have been studied and dated in the state (Rubino and Baas 2019; Taormina and Speer 2016). Providing accurate construction and alteration dates to historic sites allows archaeologists and preservationists to better identify and interpret historic resources, provides cultural information such as timber preference, and provides scientific data about the quality of past climates and forest structures (Rubino and Baas 2019; Trouet et al. 2017). Tree-ring analysis of cultural landscapes, such as the Huddleston farmstead, can guide interpretive and management decisions by providing precise construction dates for historic resources and the sequence in which they were built.

Determining the construction date of historic buildings with tree rings is performed through the process of crossdating. Crossdating is the matching of tree-ring growth patterns of timbers of unknown age with the patterns found in accurately dated reference chronologies. A chronology is a series of accurately dated tree rings obtained from a number of samples. For accurate crossdating of unknown samples, reference chronologies need to be regional and of sufficient length to reach far enough back in time to overlap with the time period in which the trees used to create the timber of the historic building were alive. Successful crossdating further necessitates that timbers contain enough tree rings to allow for an accurate match of their growth patterns with reference chronologies. Also, crossdating is aided when reference chronologies match the timber types (e.g., oak or tulip poplar) of the timbers found in a structure (Rubino and Baas 2019).

This article reports the tree-ring analyses of four buildings from the Huddleston farmstead (archaeological site number 12Wy429), a museum located on the National Road (a.k.a. U.S. Highway 40) in western Wayne County, Indiana. The museum interprets the Huddleston family's mid-nineteenth century building of a residence, farm, inn, and store to serve National Road travelers after the highway's construction through east-central Indiana. Previous archaeological investigations have identified the location of one of the farmstead's lost outbuildings and examined site artifacts within the context of Midwestern foodways (Groover and Hogue 2014; Hogue 2010; Lautzenheiser 2010; Sasser 1977; Zoll 2002). Our goals were to use tree-ring analysis to: 1.) identify construction dates for the farmstead's four surviving structures; 2.) determine if the house's ell is original or an addition; 3.) compare the results of tree-ring analysis with archival and secondary sources to see if they are in agreement; and 4.) expand local and regional reference chronologies to facilitate dating and interpretation of historic resources, especially historic National Road resources.

NINETEENTH CENTURY HISTORICAL CONTEXTS FOR THE HUDDLESTON FARMSTEAD

The Huddleston farmstead embodies two distinct historical contexts: the development of the National Road and mid-nineteenth century agriculture in the Midwest. The farmstead's association with the National Road is significant. The concept for the highway was developed very early in the Republic as a means to economically connect the geographically expanding nation. It materialized in 1806 under Thomas Jefferson's administration. As the first federally financed public roads project, "the Road" ultimately connected Cumberland, Maryland, and places east of the Appalachian Mountains to the markets of the Ohio and Mississippi River valleys. It is noteworthy for being one of the first and largest infrastructure improvement projects undertaken by the U.S. Government during its infancy (Raitz 1996).

The National Road was constructed through Indiana during the late 1820s and early 1830s. Small towns sprung up and developed along its path, providing economic opportunities to both rural and urban localities (Figure 1). Wayne County, Indiana, welcomed and prospered from the development and investment that occurred because of its construction. Cities and towns like Richmond, Centerville, and Cambridge City that are located along the road owe their existence to its construction and still display remnants of the endeavor in the form of historic homes, commercial buildings, and downtowns (Indiana Historic Sites and Structures Inventory 2001; The Indiana National Road Association 1997). These commercial centers catered to early travelers and became economic nodes that fed arterial markets in other communities throughout the region.

Figure 1. Location of the Huddleston farmstead in western Wayne County, Indiana.

Around 1835, three generations of the Huddleston family moved from North Carolina to Union County, Indiana, and then to Dublin, Indiana (Bohls 1992). In 1839 John Huddleston acquired National Road frontage to establish a residence, farm, store, and inn in the town of Mt. Auburn, a small village situated between the burgeoning communities of Cambridge City and Dublin (Lautzenheiser 2010; Quitclaim Deed 1881). Over the following years, the Huddlestons increased their acreage and the number of agricultural and domestic structures and ultimately became a prosperous farming family. They built vernacular dwellings and agricultural structures typical of Midwestern farms. The property remained in the Huddleston family until 1934 (Huddleston House Museum Files 2007). The property changed hands several times in the ensuing decades and served various functions including retail, lodging, and a restaurant. In November of 1966 Eli Lilly purchased the house, outbuildings, and 1.4 acres (0.6 hectares) and donated the property to Indiana Landmarks (Huddleston House Museum Files 2007). Over the ensuing 20 years, the house, barn, and grounds were restored with the goal of interpreting the farmstead during the National Road era of 1840 to 1860. The property opened its doors to the public as a museum in 1983 (Bohls 1992).

In its current arrangement, the historic farmstead consists of a three-story brick house, a reconstructed brick smokehouse, a structure referred to as the carriage house, and a raised, timber frame English barn (Figures 2 and 3).

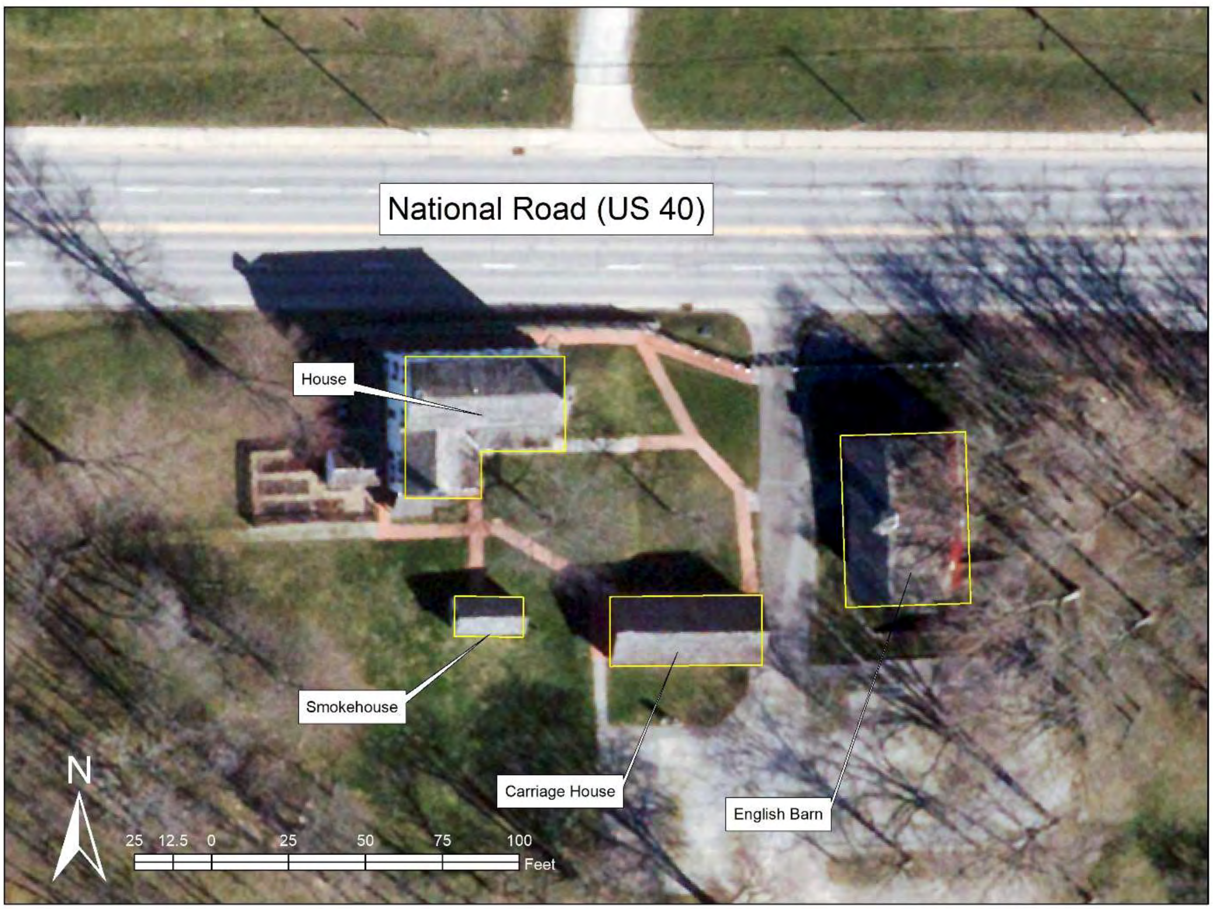

Figure 2. Aerial photograph of the Huddleston farmstead showing the location of the remaining buildings and their position on the National Road (2020 aerial photograph from Indiana Spatial Data Portal).

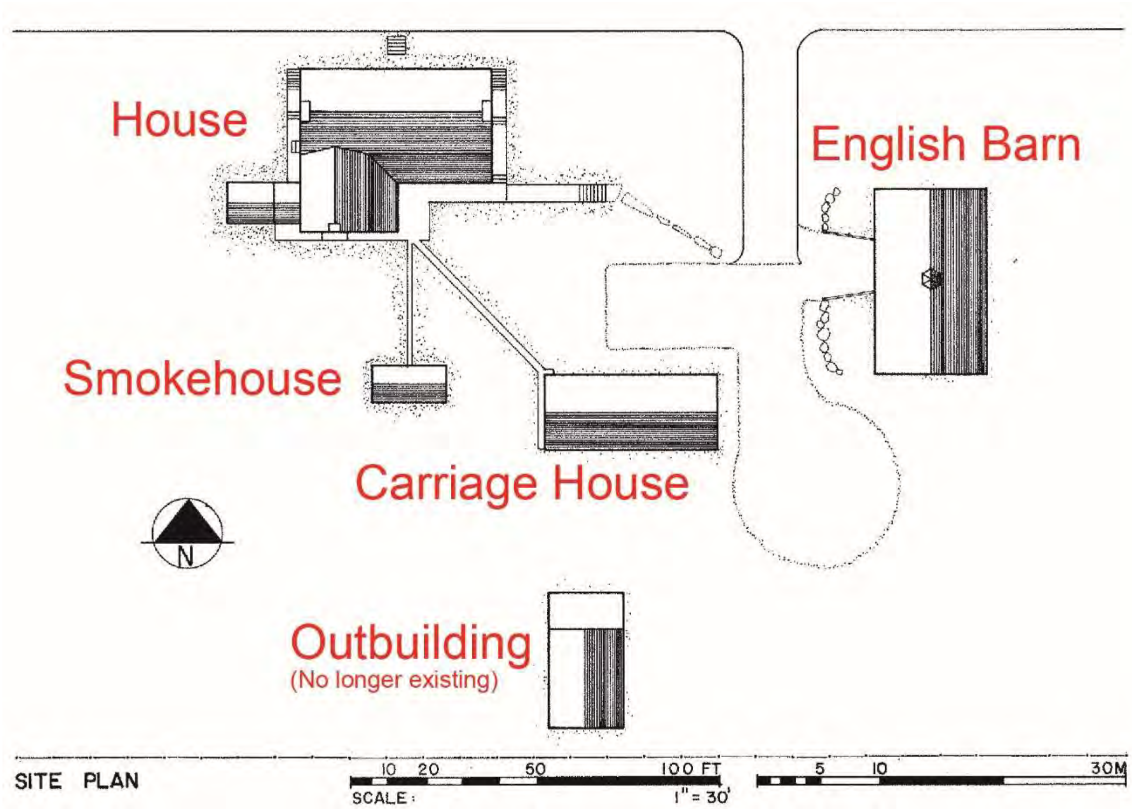

Figure 3. Historic American Building Survey documentation from 1974 showing the location of the farmstead's remaining buildings (building labels added by the authors). The structure labeled "Outbuilding" no longer exists (HABS 1974).

THE FARMHOUSE

The farmhouse is a horizontally (three rooms side by side) and vertically (three stories tall) expanded vernacular I-house (Kniffen 1965). The brick residence was constructed in the Federal Style as typified by its symmetrical main façade, end chimneys, plain gables, and flat lintels. The interior displays Greek Revival characteristics through its woodwork (e.g., fireplace mantels and door and window casings). The main house measures 22 x 50 feet (6.7 x 15.2 meters), and the three-room floor plan is repeated on all stories. A two-story kitchen ell that measures 26 x 22 feet (7.9 x 6.7 meters) is located on the house's southwest corner. A unique characteristic of the farmhouse is how its basement is constructed into a hill, resulting in an imposing three-story, six-bay front façade (Figure 4). The cellar's western and eastern rooms were built to serve National Road travelers and represent one of the last remaining and documented early nineteenth century National Road travelers' kitchens in Indiana (Reed 1975).

Figure 4. Huddleston house's north façade (left) and gable end east façade (right). The house is constructed into a hill that provides National Road access to the cellar and 1st story access to the house from the rear porch (Photo credit: Christopher Baas).

THE HUDDLESTON ENGLISH BARN

The Huddleston English barn measures 30 x 50 feet (9.1 x 15.2 meters). An English barn's simple form comes from the assembly of four parallel bents that create three individual bays. The central bay is typically a wagon aisle that is flanked by bays for storing grain or hay or for stabling animals. English barns have gable roofs and doors on the eaves' sides that access the aisle. As seen in the Huddleston barn, English barns were easily expanded to meet a farmer's needs by adding bays to the gable ends or by building them over a basement for additional space (Figure 5). The Huddleston barn is four bays wide, is raised on stone walls, and is banked into the adjoining landscape to allow the stabling of animals in the barn's basement (Bastian 1977; Glassie 1968; Kniffen 1965; Rubino and Baas 2019). Like most English barns in Indiana, the Huddleston barn contains a swing beam in one bent, a stout timber spanning the width of the barn that eliminated support posts and allowed space to maneuver a horse team during threshing (Figure 6). The barn also contains a cupola that was added to the original structure. However, limited access to its timbers prevented us from sampling this addition. In addition to Victorian Era design elements, the cupola appears in a 1936 photograph of the structure suggesting that it is a late nineteenth or early twentieth century addition meant to improve interior ventilation (Hunter and Jarzen 2011; McAlester and McAlester 1988).

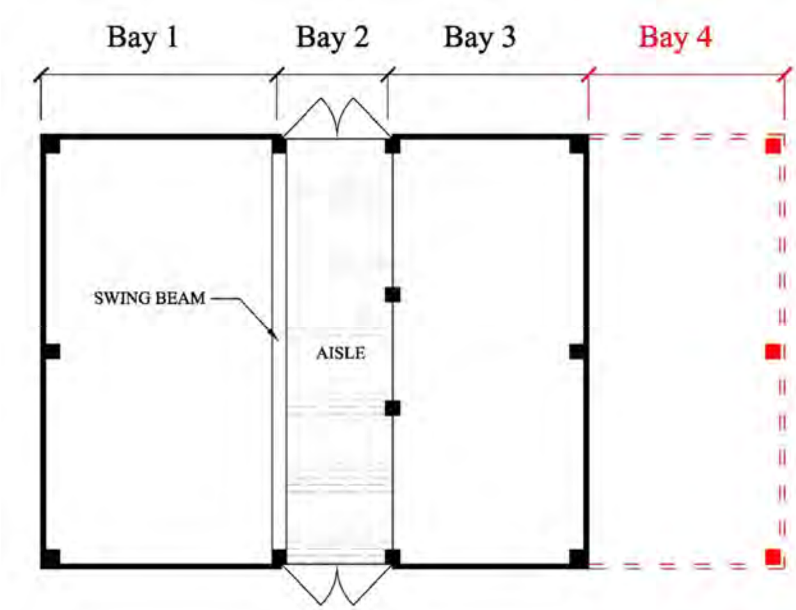

Figure 5. Plan for a typical three bay English barn. By adding bays on the gable ends (right and left in the illustration), a farmer could adapt the traditional barn form to their individual needs. The Huddleston barn was constructed larger than the traditional vernacular form by adding a fourth bay (red) and building it on a cellar.

Figure 6. The four bay Huddleston barn's west eave façade and south gable façade (left). The barn's interior (right) has been modified to host museum functions. This image shows the sampling of the bent immediately south of the aisle (HDB02A and HDB02B). The barn's swing beam is visible in the distance (Photo credit: Christopher Baas).

CARRIAGE HOUSE AND SMOKEHOUSE

The carriage house is a rectangular, gable-roofed, timber frame structure that measures 20 x 46 feet (6.1 x 14.0 meters; Figure 7). The interior contains stables and spaces for storing farm equipment. The timber frame displays a variety of alterations that include the sawn removal of sections of the sill plate, the cobbling together of timbers to construct an interior mow, and timbers with empty mortises or with mortises in suspect locations. These alterations suggest that the structure was constructed, expanded, or repaired with timbers from other timber frame structures (Huddleston House Museum Files 2007; Lautzenheiser 2010; Rubino and Baas 2019).

The smokehouse is a two-room, rectangular brick structure with a wood-frame gable roof. It measures 10 x 20 feet (3.0 x 6.1 meters; Figure 7) and is a recent reconstruction using wood parts from the original Huddleston smokehouse shown in Figure 3.

Figure 7. Huddleston carriage house's north eave façade and east gable façade (left). Interior sampling of the smokehouse's frame roof (right) (Photo credit: Christopher Baas).

ARCHIVAL SOURCES

We reviewed primary and secondary sources for information suggesting build dates for the farmstead. The construction of the National Road in Indiana began in the late 1820s, and since the road is the origin of the farmstead, we assumed that construction before this date is unlikely (Fox 1912; The Indiana National Road Association 1997). A deed describes the purchase of the property by John Huddleston in 1839 and, assuming there were no existing structures on the property, suggests a minimum construction date for the farmstead (Lautzenheiser 2010; Quitclaim Deed 1881). The 1850 U.S. Population Census shows eleven members of the Huddleston family residing in the house, suggesting the house had been built and was inhabited by 1850. It also lists John's occupation as "Farmer" as opposed to innkeeper or merchant and shows that agricultural production at the site was as much an activity as serving National Road travelers (U.S. Population Census 1850). The *Atlas of Wayne Co. Indiana* (Lake 1874) has a plat of the farmstead showing the house and barn, establishing they were constructed by the early 1870s (Figure 8). Therefore, primary documents suggest that the house (and perhaps the barn) was constructed sometime between 1839 and 1850, and that both buildings were completed by 1874. Since the carriage house is not included on the plat, we assume it was constructed after 1874.

Secondary source construction dates attributed to the farmhouse have varied and likely repeat themselves. Histories of the National Road also suggest 1830s and 1840s construction dates (Burns 1919; U.S. Department of the Interior 1994). One of the first efforts to recognize the site's historic significance occurred in 1940 when the National Old Trails Chapter of the Daughters of the American Revolution (DAR) installed a centennial plaque to the front of the house. The plaque, which honors the home's connection to the region's pioneer past, implies 1839 as the build date (Figure 9). Additionally, there are various twentieth century promotional items, and newspaper articles that place the construction of the farmhouse anywhere between 1835 and 1845. One interesting history of the house is from 1962 when the structure was converted to a short-lived restaurant (Huddleston House Dining Room). This promotional piece reports a feasible 1839 construction date but included claims that Presidents Lincoln, Polk, and Van Buren had stayed in the house, as well as the existence of tunnels used by the Underground Railroad (claims that have never been substantiated). Newspaper articles highlighting the site's restoration during the 1970s typically relied on the 1839 build date, a testament to the strength of the narrative created by the DAR plaque.

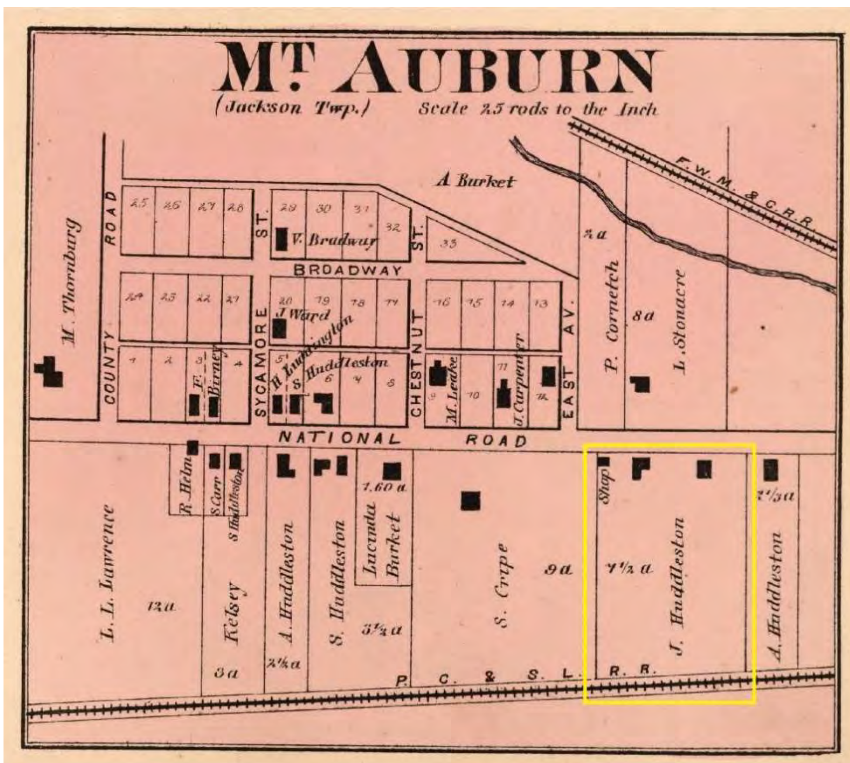

Figure 8. A plat map for Mt. Auburn, Indiana showing the house and barn constructed along the National Road. The small building labeled "Shop" no longer exists. The plat map's 1874 publication date provides a minimum date for construction of the house and barn. Since the carriage house is not included on the plat, we assume it was constructed after 1874 (Lake 1874).

Figure 9. The plaque, located in front of the Huddleston house, placed by the National Old Trails Chapter of the DAR in 1940. It reads: "Huddleston House. Built by John Huddleston of bricks made on this farm located on the old National Road. Now U.S. Highway 40. The house is typical of the architecture of the period. Pioneers going west in covered wagons found food and shelter here. The farm was entered in 1821. Placed by The National Trail Chapter, Daughters of the American Revolution, June 2, 1940." The plaque commemorates the centennial of the house's construction, which the DAR believed was 1839. The 1821 "entered" date likely refers to a land grant purchase from the U.S. government. However, property deeds indicate the Huddleston family did not own the property until 1839 (Photo credit: J.P. Hall).

Construction dates from preservation documentation cluster around the year 1840. The National Register nomination reported a range of 1838–1840 (Reed 1975). The Historic American Building Survey (HABS) reported a house construction date of 1839, and the Indiana Historic Sites and Structures Inventory (IHSSI) Wayne County Interim Report states 1841; however, the sources did not propose build dates for the farmstead's other buildings (HABS 1974; IHSSI 2001).

Research conducted by Huddleston Museum in 1992 included extensive examination of all pertinent historic material related to the site, the Huddleston family, and their relationship to the community. This information was gathered and coalesced into a paper titled, *John Huddleston's Family in Their Community, 1840-1860* (Bohls 1992). This document set the foundation for the current interpretation of the site and concluded the house was built in 1841. Unfortunately, no primary sources are cited in the research or accompanying files to demonstrate how the author reached this conclusion, but she likely made use of many of the sources listed here. Similarly, archaeological investigations also relied upon these same sources (Groover and Hogue 2014; Lautzenheiser 2010).

METHODS

Accurately determining the construction and modification dates of historically erected buildings is accomplished through sample collection and preparation, timber species identification, and crossdating using skeleton plotting and correlation analysis. A construction date for a building can be determined if the harvest date for the trees used to create the building's timbers can be determined. If multiple timbers from throughout a structure have a similar or comparable harvest date, a construction date can be inferred. Determination of a harvest date, and therefore, a construction date, necessitates dating the last ring formed by a tree before it was cut. A death or harvest date can be determined if the tree ring adjacent to the bark or from a waney edge can be accurately dated. A waney surface is characterized by a smooth, rounded outer surface free of any tool marks; the bark from the timber has simply sloughed off over time or was removed during shaping/cutting of the timber.

Briefly, samples were obtained by the authors using a drill and dry wood boring bit (Figures 7 and 10); timbers with bark or a waney edge were prioritized during sampling. Each sampled timber was photographed, and its provenience was recorded. Samples were assigned an identification containing three parts: a three-letter structure identification (e.g., HDB for the Huddleston barn), a two-digit provenience identification (individual timber), and a letter indicating the individual sample obtained from a timber. For example, HDB04B identifies the second sample (B) taken from the fourth timber analyzed (04) in the Huddleston barn. Multiple samples were taken from several timbers to help ensure that a timber did in fact have a wane edge. Multiple samples were also taken due to the propensity of American beech (*Fagus grandifolia* Ehrh.) and tulip poplar (*Liriodendron tulipifera* L.), the species encountered in the various farmstead buildings, to have missing rings. A missing or incomplete ring occurs when a stressed tree fails to produce any or a complete ring around its circumference in a given year. Missing or incomplete rings are caused by extreme stresses such as drought or mechanical injury. Taking multiple samples from a timber increases the likelihood of reliable crossdating.

Access to timbers with bark or wane varied among the buildings. The house's finished interior limited sampling to the ell's cellar utility room (HHH02A and HHH03A), a museum exhibit displaying historic plaster lath (HHH01A), and the attic (HHH4A- HHH05B; Figures 10 and 11). The nature of the English barn's exposed timber structure provided multiple samples from the barn's post and beam frame (HDB01A-HDB10A) as well as the exposed floor joists in the cellar (HDB11A-HDB14A; Figure 12). The smokehouse's timber materials were limited to its roof.

Figure 10. Sampling locations were limited in the Huddleston house. An exhibit interpreting traditional lath and plaster construction methods in the ceiling was partially dismantled to obtain sample HHH01 (left). The wood frame and a clear plastic panel were removed to gain access to a joist that was accessible through individual pieces of lath. Sampling rafters in the attic to obtain samples HHH04A through HHH05B (right) (Photo credit: Christopher Baas).

In the laboratory, each timber sample was identified to the lowest possible taxonomic rank using macroscopic and microscopic wood anatomical structures (Panshin and de Zeeuw 1980). All samples were sanded with progressively finer and finer grits of sandpaper (Stokes and Smiley 1968) to allow for tree-ring identification and measurement. Individual rings were assigned years, not calendar dates, at 40× magnification. The series of resulting tree rings were considered to be "floating" since they do not have calendar dates assigned to them, only arbitrary years. The samples were skeleton plotted, which is a graphical way to establish ring width and growth patterns (Stokes and Smiley 1968), and the tree rings were measured to the nearest 0.01 mm.

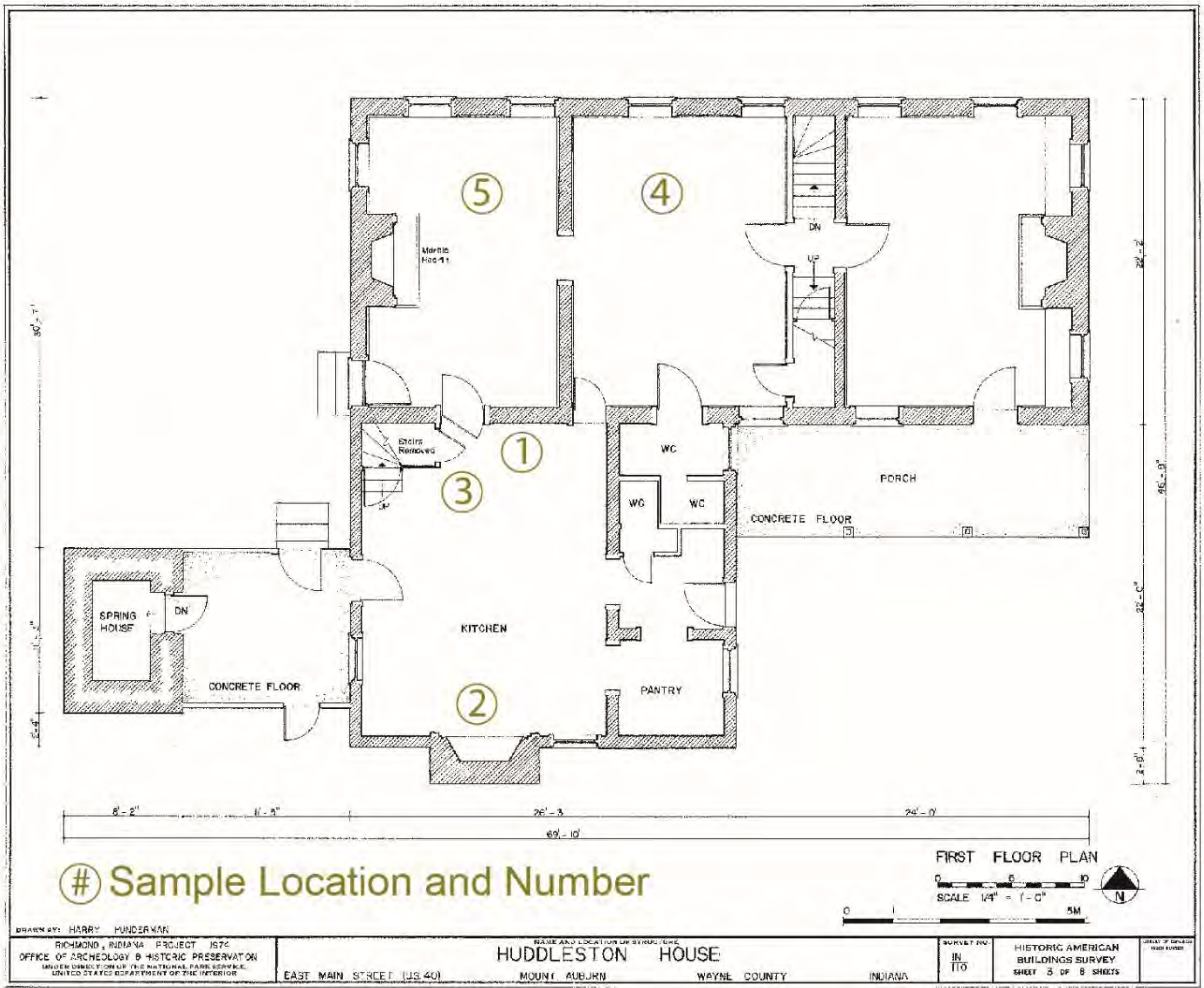

Figure 11. Sample locations for the Huddleston house shown on the first-floor plan of HABS documentation. Sample location 1 is on the house's first floor, locations 2 and 3 are in the cellar, and 4 and 5 are in the attic (drawing of house plan from HABS 1974 documentation).

Crossdating, matching the growth patterns in the samples of unknown age with each other and with those observed in accurately dated reference chronologies, was performed so that calendar dates could be assigned to individual tree rings. The samples of different timber species were analyzed separately since regional chronologies of the same species provide the most reliable crossdating (Rubino and Baas 2019). Crossdating and ultimately calendar date assignment were achieved using skeleton plots and correlation analysis of ring-width measurements. The computer program COFECHA (Holmes 1983) and ring-width measurements were used to assist in dating and in assessing date assignment. To assess internal (samples obtained from the various farmstead buildings) crossdating, each of the samples were broken down into 50-year-long segments that overlapped by 25 years. Each of these segments was correlated with all other samples (obtained at the farmstead) of the same timber species; significant positive correlation suggests that date assignment is correct. Assignment of calendar dates to samples was achieved and evaluated by comparing each of the samples and a master chronology (combination of all samples of a particular species) to accurately dated chronologies prepared from regional old-growth forests and historical buildings. A more detailed explanation of methodology (and pertinent references) can be found in related publications (Baas et al. 2017; Baas and Rubino 2012, 2013; Rubino and Baas 2019).

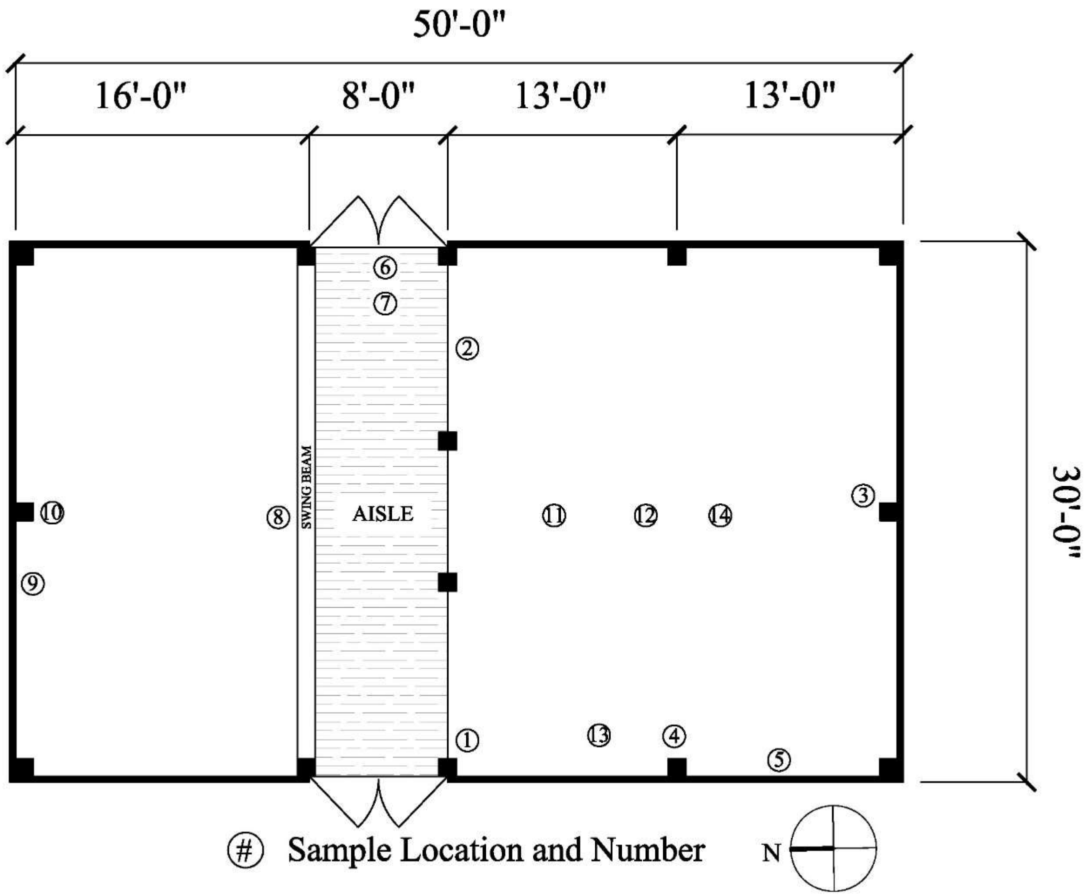

Figure 12. Sample locations for the Huddleston barn. Locations 1 through 10 are from the barn's main floor, and locations 11 through 14 are in the basement.

RESULTS

Analysis of the Huddleston farmstead produced chronologies for American beech and tulip poplar (Tables 1 and 2; Figures 13 and 14). Nineteen American beech samples (17 timbers) were collected from the house and barn to produce a chronology that spanned from 1694 to 1842 (1,817 measured and crossdated rings). Six tulip poplar samples (4 timbers) were collected from the house and smokehouse to create a chronology spanning from 1621 to 1842 (484 rings). Correlation analysis and skeleton plots suggest accurate crossdating among the American beech and tulip poplar samples from the farmstead. For American beech (Table 3), significant correlations were consistently obtained when the samples were broken down into 50-year-long segments and compared to the other American beech samples from the farmstead. Additionally, when entire individual samples were correlated with other samples from the farmstead, strong and significant correlations were observed (Table 1; *r*-value column); the overall mean correlation among all American beech samples was 0.540 (Table 2). Similar results were observed for the tulip poplar samples (Table 1). The mean correlation among all tulip poplar samples was 0.810 (Table 2); 50-year segment correlation analysis results not shown for tulip poplar.

Figure 13. American beech (HDB10A; top) and tulip poplar (HHH05B) cores obtained from the Huddleston farmstead. Wane is to the right in each core. The variation in ring width in each sample permits accurate crossdating. Bar = 1 cm. (Photo credit: Darrin L. Rubino).

Comparison of the Huddleston farmstead composite chronologies with regional chronologies suggests that crossdating was successful and that accurate calendar dates were assigned to the samples. A significant ($\alpha = 0.01$) correlation between the Huddleston farmstead and regional chronologies was found for all regional tulip poplar chronologies and for all but one American beech chronology (Table 4). Skeleton plots also indicated crossdating was successful (data not shown). Crossdating was aided by consistent signals (small rings when compared to neighboring rings) for several years. For example, American beech samples routinely exhibited small rings in 1752, 1774, 1816, and 1841 (Figure 14). The 1774 ring was missing in two of the samples, and the 1816 ring was missing in one. Similarly, small rings were regularly observed in 1724, 1752, 1754, 1774 (missing in two samples), 1816, and 1841 for the tulip poplar samples (Figure 14).

From the Huddleston house, six samples (4 American beech, r = 0.658, 1741–842; and 2 tulip poplar, r = 0.840, 1742–1842) were successfully dated; one American beech sample did not reliably crossdate (HHH01A; Table 1). The dated samples all had an outer 1843 ring associated with wane. Therefore, the trees from which these timbers were made were harvested sometime after April of 1843 (when the tree ring for 1843 begins to form) and before April of 1844 (when the 1844 ring would begin to be deposited). From the English barn, 15 American beech samples were successfully crossdated (1694–1840; 1,475 rings; r = 0.534). All timbers having wane or bark had an outer ring of 1841. Thus, these timbers were obtained from trees that were harvested after April 1841 and before April 1842.

Sampling of the smokehouse led to the creation of a chronology spanning from 1621–1779 (290 rings; r = 0.697; Table 2). Four samples from three timbers were crossdated. None of the timbers had wane or bark associated with the outermost ring. Consequently, determination of a build date for the smokehouse is not possible. In the carriage house, 5 timbers (4 American beech and 1 hard maple, either black maple [*Acer nigrum* Michx. f.] or sugar maple [*A. saccharum* Marshall]) with wane or bark were available for dendrochronological sampling. None of the samples could be crossdated reliably using regional chronologies or chronologies prepared from the other structures at the farmstead; a precise construction date was not determinable for the carriage house.

Table 1. Sample Information for the Timbers Sampled from the House, Barn, and Smokehouse at the Huddleston Farmstead, Wayne County, Indiana. First and last refer to the first and last years present in each of the samples. In the outer ring column, w = wane; b = bark; v = very close to harvest date; w/e = wane ring comprised only of earlywood; blank = outer ring is not the last ring formed on the timber, and the death or harvest date of the timber is indeterminable. r is the correlation between the ring widths of a sample and all other samples of the same species. Mean and SD are for ring width (mm). If more than one sample was taken from an individual timber, the provenience description and timber species is only given once. Sampling location for the house and barn are given in Figures 11 and 12, respectively. Note: no dates or statistics are provided for HHH01A because it did not successfully crossdate.

Sample	Timber Species	First	Last	Outer Ring	*r*	Mean	SD	Provenience
House								
HHH01A	Beech							Floor joist; second floor; ell
HHH02A	Beech	1765	1843	w	0.604	0.77	0.43	Floor joist; first floor; ell
HHH03A	Beech	1759	1843	w	0.536	0.76	0.46	Floor joist; first floor; ell
HHH04A	Beech	1761	1843	w	0.696	1.06	0.57	Rafter; main house
HHH04B		1739	1843	w	0.792	1.00	0.52	
HHH05A	Tulip	1749	1843	w/e	0.829	0.92	0.42	Rafter; main house
HHH05B		1741	1843	w/e	0.851	0.92	0.40	
Barn								
HDB01A	Beech	1724	1841	w	0.700	1.38	0.49	Post
HDB02A	Beech	1829	1841	w	0.261	1.72	0.62	Beam
HDB02B		1721	1832		0.444	1.39	0.64	
HDB03A	Beech	1730	1841	w	0.617	1.13	0.36	Post
HDB04A	Beech	1769	1841	v	0.623	1.96	0.65	Post
HDB05A	Beech	1771	1841	w	0.463	1.49	0.53	Post
HDB06A	Beech	1742	1841	w	0.504	1.40	0.42	Beam
HDB07A	Beech	1722	1841	b	0.491	0.91	0.53	Beam; upper mow
HDB08A	Beech	1693	1841	w	0.495	1.14	0.60	Swing beam
HDB09A	Beech	1710	1841	w	0.361	1.12	0.74	Beam
HDB10A	Beech	1700	1841	w	0.350	1.07	0.38	Post
HDB11A	Beech	1760	1840	v	0.673	1.27	0.45	Floor joist; ground floor
HDB12A	Beech	1701	1841	b	0.608	1.04	0.41	Floor joist; ground floor
HDB13A	Beech	1737	1841	w	0.647	1.07	0.52	Floor joist; ground floor
HDB14A	Beech	1727	1841	w	0.675	0.93	0.38	Floor joist; ground floor
Smokehouse								
HDS01A	Tulip	1620	1731		0.719	1.05	0.34	Ceiling joist; west room
HDS02A	Tulip	1645	1686		0.703	1.15	0.40	Ceiling joist; west room
HDS02B	Tulip	1712	1754		0.66	1.28	0.44	
HDS03A	Tulip	1680	1780		0.69	1.07	0.39	Ceiling joist; east room

Table 2. American Beech and Tulip Poplar Chronologies Obtained from the Huddleston Farmstead, Wayne County, Indiana. First and last refer to the first and last dates in the ring-width chronologies. Samples and timbers are the number of samples and timbers that crossdated reliably; undated is the number of timbers that could not be crossdated. r is the mean correlation coefficient for each sample for the two species. Mean and SD are the mean and standard deviation (mm) ring width for each chronology.

Structure	Timber type	First	Last	Rings	Samples	Timbers	Undated	*r*	Mean	SD
House	Beech	1741	1842	342	4	3	1	0.658	0.90	0.50
House	Tulip	1742	1842	194	2	1	0	0.840	0.92	0.41
Barn	Beech	1694	1840	1475	15	14	0	0.534	1.20	0.51
Smokehouse	Tulip	1621	1779	290	4	3	0	0.697	1.10	0.38
All	Beech	1694	1842	1817	19	17	1	0.540	1.15	0.51
All	Tulip	1621	1842	484	6	4	0	0.810	1.03	0.39

Table 3. Correlation Results for 50-year-long Segments (overlapping by 25 years) for each of the Dated American Beech Samples Obtained from the Huddleston Farmstead. Correlation values were obtained by correlating each segment with all other samples. A correlation coefficient > 0.33 indicates a significant correlation (P < 0.01) for the segment. Data are only presented if 10 or more samples were available for analysis for a given year.

Sample	1725–1774	1750–1799	1775–1824	1800–1849
HDB01A	0.78	0.82	0.64	0.69
HDB02B	0.64	0.65	0.46	0.42
HDB03A	0.74	0.78	0.54	0.45
HDB04A		0.65	0.64	0.54
HDB05A		0.48	0.50	0.43
HDB06A		0.40	0.43	0.45
HDB07A	0.59	0.62	0.35	0.43
HDB08A	0.81	0.79	0.50	0.57
HDB09A	0.56	0.54	0.47	0.43
HDB10A	0.52	0.56	0.35	0.33
HDB11A		0.61	0.57	0.63
HDB12A		0.63	0.54	0.54
HDB13A	0.79	0.76	0.56	0.53
HDB14A	0.76	0.82	0.76	0.74
HHH02A		0.50	0.50	0.48
HHH03A		0.58	0.62	0.63
HHH04A		0.69	0.55	0.49
HHH04B	0.55	0.62	0.51	0.55

Table 4. Correlation of Huddleston Farmstead American Beech and Tulip Poplar Ring-width Chronologies with Regional Chronologies Prepared from Historical Buildings and Forests (samples and data archived in the Hanover College botanical collections). Span is for the regional chronology, years is the number of years overlapping between the Huddleston chronology and the regional chronology, r is the correlation coefficient obtained by correlating the American beech or tulip poplar chronologies from the Huddleston farmstead with the various regional chronologies, and P is the probability associated with the reported correlation coefficient. For American beech, only portions of the Huddleston chronology with 10 or more rings present for a given year were analyzed.

Chronology	Span	Years	*r*	*P*
American beech				
Rush County, IN	1690–1853	100	0.675	< 0.001
Fountain City, IN	1687–1849	100	0.581	< 0.001
Fayette County, IN [1]	1725–1833	93	0.511	< 0.001
Versailles State Park (Ripley County, IN) [2]	1684–2010	100	0.492	< 0.001
Musée de Venoge (Switzerland County, IN) [3]	1701–1827	87	0.539	< 0.001
Switzerland County, IN [3]	1714–1851	100	0.422	< 0.001
Tribbett's Woods (Jennings County, IN)	1769–2009	72	0.223	0.060
Tulip poplar				
Fountain City, IN	1523–1849	222	0.635	< 0.001
Corydon, IN	1575–1901	222	0.392	< 0.001
Jefferson County, IN	1457–1889	222	0.379	< 0.001
Greencastle, IN	1589–1877	222	0.586	< 0.001
Fayette County, IN [1]	1598–1868	222	0.582	< 0.001
Rush County, IN	1636–1853	102	0.505	< 0.001
Washington County, IN	1637–1882	206	0.291	< 0.001

1 = Hall et al. (2020); 2 = Rubino et al. (2019); 3 = Rubino and Baas (2019)

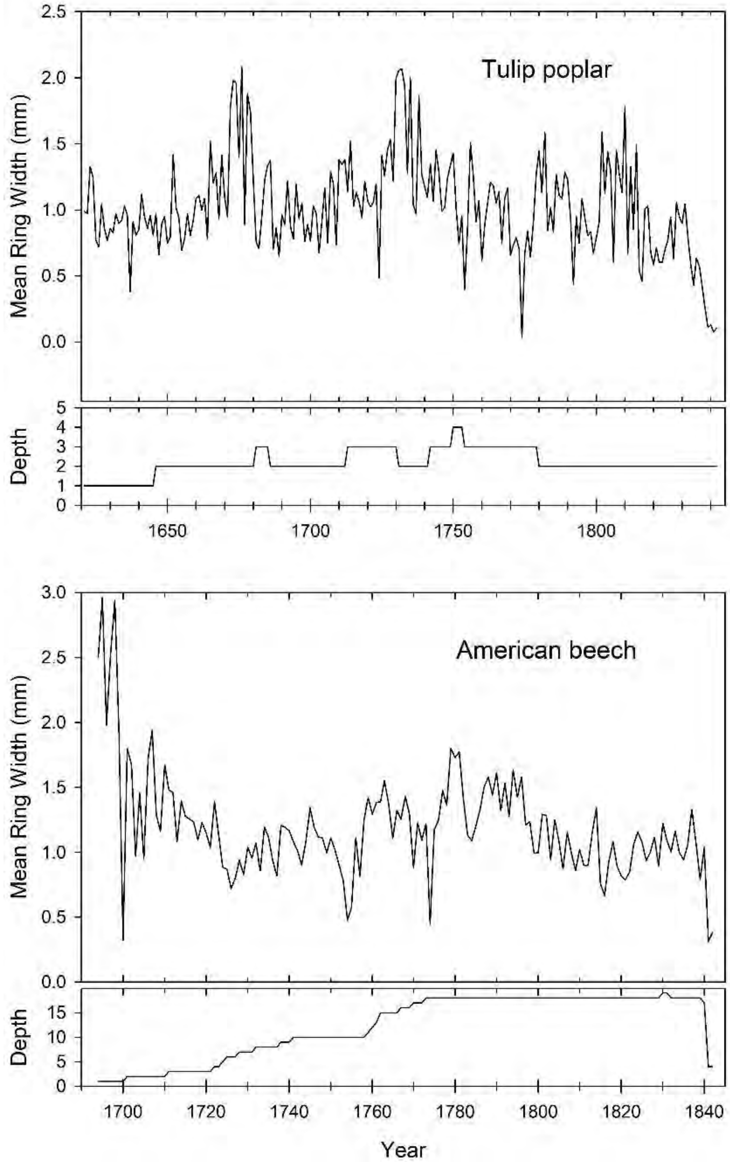

Figure 14. Mean ring-width chronologies (mm; top panels) and sample depth (number of samples with a ring present in an individual year; bottom panels) for tulip poplar and American beech. Note: axes scale varies among graphs.

DISCUSSION

Our goals for the tree-ring analysis of the Huddleston farmstead were to: 1.) identify construction dates for the farmstead's four surviving structures; 2.) determine if the house's ell is original or an addition; 3.) compare the results of tree-ring analysis with archival and secondary sources to see if and where there is agreement; and 4.) expand local and regional reference chronologies, as they relate to historic and National Road resources, for current and future tree-ring studies.

Regionally, buildings were routinely constructed immediately after timber harvest (e.g., Hutslar 1986; Rubino and Baas 2019), and without strong archival sources that state otherwise we base construction dates on the death or harvest dates of the tree supplying timbers for a building (Rubino and Baas 2019). For example, if timbers from a structure share an 1850 harvest date, we assign an 1850 construction date to the building. We successfully determined build dates for two of the four farmstead buildings sampled, and tree-ring analysis was able to bring some clarity to conflicting dates in secondary sources.

Secondary sources identified an August 1839 construction date for the English barn (Huddleston House Museum Files 2007). Tree-ring analysis successfully identified an 1841 harvest date for the dated timbers in the barn. While dendrochronological analysis is very powerful and reliable in establishing when timbers are harvested, it cannot provide the precise date of when a structure was erected (Baillie 1982). For example, the barn could have been erected as early as the late summer of 1841 or in the winter/early spring of 1842.

Construction dates of the I-house vary among sources, with dates as early as 1835 and as late as 1845. In 2007, secondary sources were assembled by museum staff in a timeline format; the document provides surprisingly detailed and very exact information about the Huddleston property, buildings, and family. However, it does not include sources for the provided dates. In the case of several entries, two possible dates are given, with one followed by a question mark (Huddleston House Museum Files 2007). According to the source, ". . . a little cabin barely high enough for a man to stand in" was initially constructed on the property. Later, a hewn log house was built, and the family lived in that while the brick house was being built (Huddleston House Museum Files 2007). Therefore, the current brick residence is the third house on the site. The document also states that in 1844 a brick maker was hired and that the bricks were fired and stacked on site. However, an 1840 date followed by a question mark is also given; the questioning of the 1844 date likely alludes to the previous entry in the timeline stating that Huddleston probably began building the brick house in 1840.

By combining secondary sources and tree-ring analysis a clearer idea of when the house was likely built can be hypothesized. Tree-ring analysis successfully identified an 1843 harvest date for the timbers sampled in the ell and attic. Therefore, the dated timbers could have been placed in the house as early as the late summer of 1843. The timbers that were sampled (and those that were not) were sawn (Figure 10) and were obtained from an unknown sawmill in either 1840 or 1844 according to the Huddleston House Museum Files (2007). The 1844 date is tenable. Unfortunately, the length of time that passed between harvesting the trees, sawing the lumber, transporting it to the farmstead, and placing it in the structure is unknown so an exact construction date is not available.

Construction of large brick structures took multiple years to complete (Baas et al. 2018; Rubino and Baas 2019). We believe this to be true for the Huddleston house as a hewn timber structure was erected and "the family lived in this house only a few years" during construction of the brick house (Huddleston House Museum Files 2007). In this investigation we were able to date timbers from the attic. The 1843 date of these timbers would more likely provide a completion date for the building rather than a date for when construction began. Obtaining samples from historic structures is often limited by accessibility, safety, and potential damage. Since the house's interior has been restored as a museum, sampling was not possible in the cellar or lower stories of the house. Therefore, the year in which the house construction began cannot be determined using tree-ring analysis.

Several histories tied construction to the 1839 purchase date of the property. We conclude that an 1839 construction date is unlikely: timbers harvested in 1843 were found in the building, and the Huddleston family used temporary housing at the farmstead for several years (and Huddleston did not acquire the property until 1839). We often see archival resources, especially dates from property deeds, lead historians to construction dates (much) earlier than those established by tree-ring analysis (Hall et al. 2020). The *IHSSI* (IHSSI 2001) and Bohls' (1992) analysis of the farmstead reported an 1841 date for the house. Using tree-ring data and secondary sources, we conclude that both of these sources may be citing the initiation of construction but not the completion of the building. Therefore, from secondary sources and a lack of sample opportunities throughout the building, a completion date in or near 1843 seems the most likely.

Tree-ring analysis also allowed for determination of the construction date of the house's ell. Building ells, the small projections off the back of many of Indiana's nineteenth century houses, especially rural I-houses, often appear, or are thought to be, building additions. Ells are typically one or two stories in height and usually contain a kitchen. Tree-ring analysis was able to establish that timbers in the house's ell have the same death dates as those in the house's attic, indicating that it was constructed simultaneously with the main house.

Tree-ring analysis did not allow for construction dates to be established for the carriage house or smokehouse. The samples obtained from the smokehouse did not contain wane or bark. The timbers were chamfered along the edges (parallel to the grain) and appeared during sampling to represent wane. However, after sanding the cores, the outermost edge of the timbers contained only the olive-green heartwood commonly found in tulip poplar timbers of historically erected buildings. Based on analysis we can only conclude that the building was constructed sometime after 1780, the date of the outermost ring in any of the timbers sampled (Table 1). Given regional settlement patterns this result provides little interpretive information regarding the smokehouse other than a minimum build date of 1780.

Sampling the carriage house did not allow for a construction date to be determined. The samples obtained from the building did not crossdate reliably with any available dated chronologies. Successful crossdating is only possible if certain conditions are met. For example, reference chronologies that cover the lifespan (or most of it) of the trees from which the undated timbers were taken are essential. We hypothesize that the timbers used in the construction of the carriage house were harvested from a period later than any of the immediately local chronologies (chronologies from neighboring counties extend only to the 1850s; Table 4), thus precluding crossdating. A later construction date is supported by the absence of the building in the 1874 *Atlas of Wayne Co. Indiana* (Lake 1874), and Lautzenheiser (2010) and the Huddleston House Museum Files (2007) state that the carriage house was modified in 1909.

Close examination of the *in situ* timbers corroborates a late nineteenth century construction/modification/rebuild and suggests that the building was constructed from recycled timbers—the timbers had unnecessary mortises and/or showed evidence of being sectioned and repurposed, Recycling of timbers is commonly observed in late nineteenth century structures (Rubino and Baas 2019). Additionally, the growth patterns in the final decades prior to harvest were very different among the timbers, thus suggesting that the timbers were harvested at different times. Tree rings offer little help in establishing a date for the carriage house, but secondary sources give the structure a construction date between 1874 and 1909. The carriage house samples may be datable as more local chronologies covering a later period are developed (e.g., the middle and late nineteenth and early twentieth centuries). This region of the state has only recently been the subject of dendroarchaeological studies, and it currently lacks long chronologies constructed from numerous samples, a necessity for accurate crossdating. (Rubino and Baas 2019).

The Huddleston I-house's 1843 and English barn's 1841 construction dates demonstrate the popularity, utility, and flexibility of two vernacular building forms. Both building forms originate in North America from East Coast cultural hearths (i.e., the locations of the original European colonial settlements) and were brought by settlers to both frontier and mid-nineteenth century Indiana. The family adapted the most essential of these building forms to meet uses specific to their location on the National Road. The traditional 3-bay English barn was expanded with an extra bay and raised on a stone foundation to allow a cellar-level livery that secondary sources report contained as many as 28 stalls to accommodate travelers' horses, with hay and oats likely stored on the floor above (Huddleston House Museum Files 2007). The I-house was also constructed on a hillside cellar with street level access to travelers and lodgers, and expanded longitudinally with the addition of the west bay to the traditional central hall layout.

The 1840s construction dates of these vernacular building types are consistent with our evaluation of similar structures throughout the southern half of the state. Tree-ring studies have analyzed English barns constructed as early as 1824 in Switzerland County (Rubino and Baas 2019), in 1831 in nearby Fayette County (Hall et al. 2020), and as late as 1891 in Jefferson County, Indiana (Rubino and Baas 2019). Construction dates for I-houses and similar central hall type houses in southern Indiana have been determined as early as 1808 in Lamb, in 1851 in Paoli, and 1856 in Switzerland County (Rubino & Baas 2019).

Tree-ring analysis resulted in a new, regional American beech chronology, which is unique since beech is not the most typical species used in historic construction. While a species identification of all the barn timbers was not performed, we were able to identify a bias for American beech in the construction of the barn. The assumed preference of early settlement barn builders is oak (e.g., Rubino and Baas 2019). Several explanations for the nearly exclusive use of beech in the barn are possible. For example, selection of beech may have been based on a size bias rather than a species bias. Tree censuses of old-growth forests suggests that regional Beech-Maple forests contained little oak (Lindsey et al. 1969).

This study also contributed to the development of regional tree-ring chronologies that currently include sites from Fountain City and Cambridge City in Wayne County and Posey Township in Fayette County. This is important because the loss of pre-settlement forests impedes the use of living trees in building regional tree-ring chronologies (Stahle 1979). By using tree-ring patterns from timbers found in historically constructed buildings, buildings that likely contain timbers from old-growth forests, it is possible to extend chronologies further back in time (Senter 1938; Stahle 1979). Historic buildings, like those at the Huddleston farmstead, are essential for the creation of informative, long-term regional tree-ring chronologies. In turn, such chronologies can be useful for studying past tree and forest growth patterns (Trouet et al. 2017). Unfortunately, these resources are rapidly disappearing from the landscape.

The Huddleston farmstead can also act as a catalyst for further tree-ring research of extant nineteenth century historic structures along the National Road as a means of better understanding the development of this nationally significant transportation corridor. By documenting early structures through tree-ring analysis, concurrent with primary document research, patterns of development may be revealed that can clarify the timing, sequence, and growth of the built environment. Currently, we have analyzed six resources located on the National Road: Huddleston's four structures, a commercial building in Cambridge City, and a tavern in Lewisburg, Ohio. We are hoping to expand our analysis throughout Ohio, Indiana, and Illinois.

The scientific study of historic structures and landscapes offers both cultural and scientific information. Tree-ring analysis of the Huddleston farmstead adds to the site's archaeological record by establishing construction dates for the house and barn. Field study also adds to the knowledge base of central Indiana's rural and commercial architecture by identifying build dates and the species of timber preferred by early builders. Lab work produced new American beech and tulip poplar chronologies reaching back to the seventeenth century (2,301 total rings crossdated). Approaching almost 180 years of age, the farmstead is a unique relic of the state's early transportation, commercial, and agricultural development that continues to offer opportunities for archaeological discovery.

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THE TIN CITY SITE (12VG2024) ON THE UNIVERSITY OF EVANSVILLE CAMPUS

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INTRODUCTION

A unique site on the University of Evansville campus is offering insight into a population of students little studied archaeologically as well as the opportunity to develop archaeological pedagogy and public outreach tailored to a university community. In 1946 administrators at Evansville College, as the university was known then, built 13 temporary housing units and reserved them for married veterans attending school with the help of the GI Bill (Figure 1). Documentary sources do not agree on the official name of the complex using both "College Courts" (e.g., Evansville Crescent 1946a:1) and "Campus Courts" (e.g., Evansville Crescent 1947:4). Thanks to the units' corrugated steel siding and roofs, students dubbed the collection of structures "Tin City" (Evansville Crescent 1960b:1; Olmsted 1973:148), "Tin Can Alley" (Palmisano 1947:1), and the "Quonset Huts" (see below) among other names. A subsequent college president had the units dismantled and removed in 1962 to make room for new buildings.

The genesis for the Tin City Archaeological Project came in 2003 as the university's upcoming sesquicentennial celebration sparked interest in discovering forgotten aspects of the institution's history and the subcultures that made up the student body. A map (Sanborn 1910:246, updated May 1951) and an aerial photo taken in 1953, which Evansville Historic Preservation Officer Dennis Au kindly provided the project, contained evidence for the buildings' locations. A GIS analysis defined the UTM coordinates of each Tin City unit. Augering and test pits confirmed the accuracy of these remotely determined coordinates. The state of the buildings' preservation can only be defined as destroyed. None of the corrugated galvanized steel siding or roofing remain and the cement pads on which the structures had stood had clearly been shattered, probably by a jackhammer. Workers must have removed the largest pieces of cement, but many small pieces remain. The project's first phase focused on locating the exact site of the Tin City units and assessing their archaeological potential. The hope was that we would be able to study the architecture of the units, searching for clues to both their construction not contained in the written and photographic record as well as evidence for the lived experience in a Tin City unit. Unexpectedly, enough personal artifacts have turned up to allow us to plan for a future phase in which we will analyze issues of gender and class status in the immediate aftermath of World War II among what journalist Tom Brokaw dubbed the "greatest generation." Over time, the project has also developed programs for exposing undergraduates to the field of archaeology and preparing some for future careers while proving to be an invaluable vehicle for public outreach and education.

Figure 1. View of the Tin City apartments on the Evansville College campus in 1947. Photo courtesy of the University of Evansville Library Archives.

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Historians find it difficult to overstate the impact the GI Bill has had on American culture and, especially, higher education. During the waning days of World War II, the United States Congress contemplated a bill to aid in the reintegration of millions of service personnel into civilian society, the Servicemen's Readjustment Act of 1944 or, as it came to be known by its nickname, the "GI Bill." Historian Peter Drucker has claimed the passage of the GI Bill constituted ". . . the most important event of the 20th century . . ." (1993:3) while Michael Bennett states flatly "[q]uite literally, the G.I. Bill changed the way we live, the way we house ourselves, the way we are educated, how we work and at what, even how we eat and transport ourselves" (1996:8). The bill provided financial support for veterans to start businesses, build homes, and go to college. As they enrolled in record numbers, student-vets remade American colleges and universities from elitist institutions into gateways to the middle class for theirs and the following generations. To meet the expectations of veterans, institutions created counseling centers for career planning, study skills, and a slew of personal psychological, emotional, marital, sexual, and social challenges, services that vets expected would remain for their children once they went to college a generation later. College dormitory residential assistants, so ubiquitous today, made their appearance to aid GIs in their transition to college life. Classes increased in size to accommodate all those seeking an education with machine-graded exams and teaching assistants becoming standard features in higher education (Altschuler and Blumin 2009:94-95, 111). Although white men were the primary recipients of its educational benefits, the GI Bill still changed millions of lives as the Veterans Administration claimed in 1964 that ". . . 450,000 engineers, 180,000 doctors, dentist and nurses, 360,000 school teachers, 150,000 scientists, 243,000 accountants, 107,000 lawyers [and] 36,000 clergymen . . ." paid for their education with help from the bill (quoted in Olson 1974:109). While historians have written a tremendous amount about the GI Bill and its many aspects, archaeologists have had little to say on the topic, probably because of the difficulty of isolating archaeological remains associated with such a specific population. To the author's knowledge, only one brief excavation at the site of the so-called "Veterans Village" on the campus of Santa Clara University in California has focused on housing units associated with the GI Bill (Skowronek and Hylkema 2010).

Between 1945 and 1950 the United States suffered its worst housing shortage in the nation's history (Olson 1974:66). Evansville, Indiana, was not exempt. In an advertisement in the Evansville College yearbook from 1947, a local realtor laments with questionable grammar: "Sorry veterans! That we were unable to supply houses for all who called at our office during the last year" (LinC 1947:154). To assist recently married veterans attending Evansville College, President Lincoln Hale acquired 13 prefabricated buildings containing two apartments each. During its 16 years of use an estimated 500-550 people lived in the Tin City structures. While married veterans lived in the Tin City complex for its entire 16-year history, their numbers declined after the mid-1950s. Beginning in 1954, the *Evansville Directory* lists some units as vacant with as many as three empty in 1960 and four in 1961. In the face of this housing surplus, administrators allowed non-veterans to occupy the apartments. In 1962 a new administration tore down the units to make room for new construction. While an auditorium destroyed the site of one and a half of the Tin City apartments, landscaping, a sidewalk, and a driveway covered the rest, sealing archaeological deposits (Figure 2).

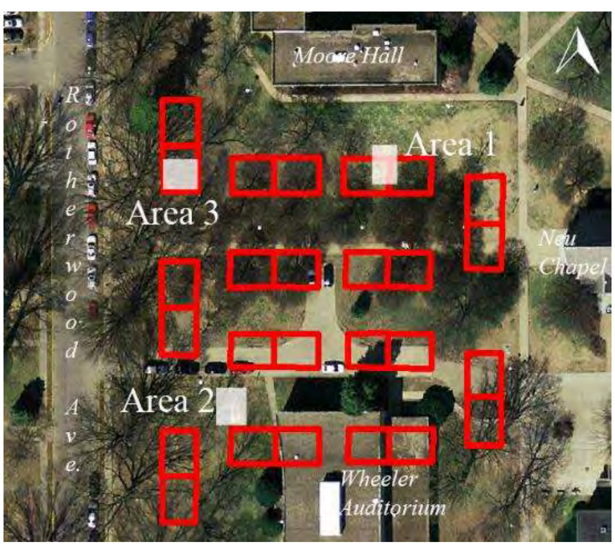

Figure 2. Aerial photo of the Tin City site with areas of study marked. Red lines outline the tentative locations of the Tin City apartments. (Photo from Google Earth, plan by the author.)

In 2003 the Department of Archaeology and Art History undertook a program of research into the historical and archaeological evidence for Tin City. The Tin City research became built into the curriculum for the course ARCH 340 Field Techniques in Archaeology. Relying on students enrolled in the course as field technicians and being tied to the academic calendar has made the project unfold in slow motion when compared to other excavations. Students spend only around 27 hours in the field each semester, and many are experiencing their first field work, which makes for slow progress. Also, the requirements of a teaching schedule have led to occasional multi-year gaps between field seasons. Now, however, the project has produced enough data to warrant publication of preliminary results. While the archaeology of Tin City is the focus of this article, information students helped to gather from archival sources, as well as interviews with 18 people who lived in the Tin City units, most conducted in 2004, supplement the conclusions. Unfortunately, most of the people interviewed have since passed away, denying the opportunity to clarify ambiguities in the transcriptions and to ask additional questions.

METHODS, STRATIGRAPHY, AND DATING

Prior to excavation, student-field technicians conducted a surface survey over the entire Tin City site without finding a single artifact. University of Evansville groundskeepers appear to do a meticulous job keeping the campus clean. Auger probes helped tentatively confirm the location of the archaeological remains. The local utility company stated that no natural gas pipelines existed on the part of university property identified by the GIS mapping. Beyond that, unfortunately, no maps documenting the location of electrical lines or sewer pipes survive at the university (Larry Horn, University of Evansville's Director of Facility Administration, personal communication 2003). Two lines of lampposts indicated the presence of buried electrical lines and limited areas open to excavation. The first trenches in what came to be identified as Area 1 examined the location of apartments 5A and 5B (Figure 2). Expecting artifacts close to the surface, excavators worked primarily with trowels and small picks, screening dirt with ¼" mesh. Originally, we dug a 9 x 2 m trench oriented north-south in an attempt locate the building and define its northern and southern limits. The southern portion of the trench proved so rich in artifacts that we added an additional 3 x 2 m trench adjoining the original trenches to the west. After encountering sterile soil, a second series of trenches in what we called Area 2 focused on the location between the front doors of two facing apartments, 8A and 10A. The intention was to discover if we could detect a different pattern of artifact deposition between the interior and exterior locations. Seeking more horizontal exposure, we laid out an 8 x 4 m trench, again oriented north-south. A linear discoloration in the soil (10 YR 5/8) crossing the trench in Area 2 pointed directly at a lamppost, suggesting a buried electrical cable ran from the auditorium to one line of posts, a discovery that forced the abandonment of Area 2 in the interest of safety. Much of Area 2 also appeared to have been greatly disturbed by the activities in 1961 as workers built the auditorium, thwarting our objective. A third set of trenches, Area 3, uncovered remains of Apartment 1B. Excavation is ongoing in this area as we work in a 5 x 6 meter trench. All trenches produced similar stratigraphic patterns. A homogenous matrix (10 YR 4/4) required digging in 10 cm arbitrary units. Within the grass root layer Tin City-era artifacts mixed with post-Tin City artifacts. The stratigraphic units below the first 10 cm layer had a mixture of artifacts from the Tin City units and from the construction of the dormitory Moore Hall (Areas 1 and 3) and performance space Wheeler Auditorium (Area 2) as the Tin City units where demolished and the dormitory and auditorium were built in quick succession. Artifacts uncovered in this stratigraphic layer rested at a variety of angles, some almost completely vertical (Figure 3), indicating deposition in one episode. Sterile soil appeared between about 30 and 35 cm below the surface. The southern ends of Areas 1 and 3, which were closest to a line of lampposts, differed from the rest of the trenches in showing recent disturbance to a deeper level as well as a slightly darker soil color (10 YR 3/3). At the bottom of one of these disturbed trenches, nearly 50 cm below the surface, bits of a Styrofoam cup and a Honey Bun wrapper with a January 2003 expiration date emerged, indicating recent work, presumably on the nearby electrical cables. In Area 1 the buried stump and roots of a long-dead tulip tree, which some maintenance personnel remembered growing on that spot until its death in the mid-1990s, also disturbed the stratigraphy.

Figure 3. Nearly vertical nail (TC 1124) uncovered in Area 3 indicating the deposition of the layer in one event. Photo by the author.

The sequence of anthropogenic events on this spot, therefore, begins with the construction of the Tin City units in the summer of 1946 (Evansville Crescent 1946a:1). In 1960 the university constructed a dormitory north of Tin City (Evansville Crescent 1960a: 2), evidence of which survived in the archaeological record as several pieces of white bricks turned up, identical to those used in the façade of the dormitory, particularly in Area 1. The Tin City units met their fate in 1962 as the auditorium arose (Evansville Crescent 1961:1). While workers removed most of the large pieces of the Tin City buildings, small bits of the architecture as well as artifacts lost in the units over time remained in and on the ground. The rounded edges and small average size of a sampling of brick (5 g), concrete (25 g), and wall plaster (7 g) from the Tin City units suggest the passage of trucks, heavy equipment, and workers' boots ground them down. Broken bits of cinder block, bricks, and roofing tar from the auditorium project remained upon its completion in Area 2. One hardened puddle of tar even retained the impression of a burlap sack on which it must have fallen while in a liquid state. Upon completion of the auditorium, workers must have leveled the site and left it to landscapers to plant trees and sod. No indication survived, suggesting the landscapers brought in a layer of dirt before commencing their work and, since the site is quite flat, there is no reason to believe any dirt brought in in 1962 could have eroded away. All the artifacts, therefore, appear original to the site, without contamination from elsewhere, and datable artifacts fit either the Tin City period and construction period of the nearby buildings or the later period when the students used the area for leisurely pursuits.

ARCHITECTURAL EVIDENCE

The documentary evidence offers minimal information about the architecture of the Tin City units. Unfortunately, no one deposited any of the letters or contracts involved in the project in the university archives. Aside from two nearly identical photographs (Figure 1), the university administration preserved no record of Tin City. What is clear from the archival evidence is that college president Lincoln Hale intended the Tin City apartments to be only temporary additions to campus. Hale preferred temporary buildings, presumably because he expected that once the veterans completed college, enrollment would return to pre-war levels. He obtained other unused war buildings to augment classroom and office space. In a document in the university archives dated to 1948 he wrote enthusiastically, using underlining and capitalization for emphasis, about the number of structures on campus: "From Three buildings in 1945 to Ten in 1948 but only Two are Permanent. Temporary buildings enable us to do the job for the present" (Hale 1948). Since 13 Tin City apartments stood on campus at the time he wrote, more than the total number of temporary buildings Hale mentions, he appears to have forgotten about or dismissed them.

The Evansville College administration worked with the Federal Housing Authority in 1946 to transfer the prefabricated materials, which the U.S. government had purchased for the war effort, from storage in Baton Rouge, Louisiana, to Evansville (Evansville Crescent 1946a:1). According to a map of the area, the Tin City units were frame buildings clad in metal (Sanborn 1910:246, updated May 1951). A series of three photos taken in July and August of

1946 show the buildings under construction (Donahue 2010:19). In two of the photos, piles of prefabricated wooden frames lie in the grass awaiting assembly while in the third, men hammer at the skeletal frames of two structures as three more buildings appear more complete, sheathed in corrugated steel. Some people interviewed referred to the units as "Quonset huts," probably because both types of structures shared the corrugated galvanized steel shell. True Quonset huts, however, have a half-cylinder shape, while in all photos, the Tin City buildings clearly have vertical walls and gable roofs, indicating they were not Quonset huts. The university rented the apartments furnished, and each unit consisted of four rooms, a dining-living room with a galley kitchen along with two bedrooms, and a bathroom reached by a hallway (Evansville Crescent 1946b:1).

The archaeological evidence indicates the haste or inexperience of the workers erecting the buildings, no doubt a result of the insatiable demand for new construction in post-war Evansville. Architectural material survived, especially a large number of concrete fragments (Table 1). Many of the concrete pieces that retained a flat surface preserved traces of grey paint (Gley 1 5/1) (Figure 4). Upon seeing these pieces, all of the former Tin City residents recognized them as the flooring; the buildings had been erected on concrete pads painted grey. Some of these concrete pieces appeared poorly mixed, some even crumbled when removed from the ground having pockets with too much sand. The archaeological evidence proves not only a shortage of competent workers or time to properly mix the cement but also a scarcity of material, which is suggested by the variety of stoneware ceramic drainpipe. In one of the photos of the buildings under construction mentioned above, one can see two segments of ceramic pipe laying on a dirt pile, probably from the excavation of the trench for the sewer lines under the concrete pads. Few excavated pieces of drainpipe match the color, glaze, or fabric of one another. Construction suppliers seem to have been scrambling to find enough resources for builders, getting whatever they could from manufacturers as fast as those manufacturers could produce it. Any single drainage line at Tin City consisted of standard-sized pipes provided by a variety of factories.

Table 1. Summary of Architectural Artifacts.

Artifact Fragment Type	Count
Concrete	412
Flat Glass (window)	25
Nail	215
Stoneware drainage tile	71
Iron pipe	1
Floor tiles	80
Red / orange brick	1,553
Wall plaster	581

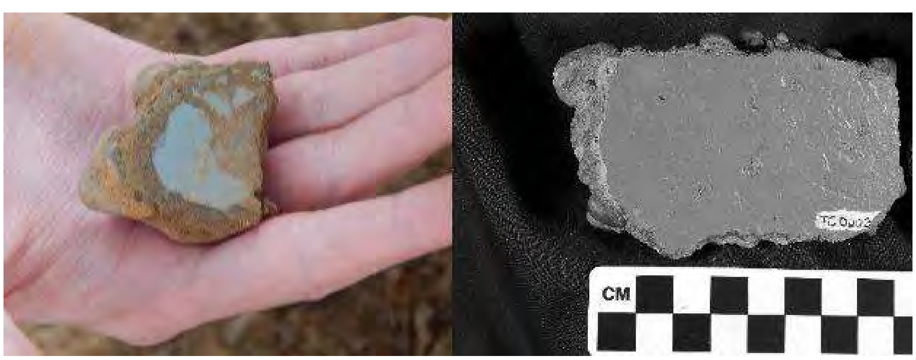

Figure 4. Examples of Tin City flooring with grey paint. Left TC1023 from Area 3, right TC0003 from Area 1. Photos by the author.

While all former residents interviewed had fond memories of living at Tin City, the archaeological evidence and interviews both make it clear how uncomfortable the units were. The grey concrete floors would have been freezing to the touch in the winter, which may explain what appears to be a throw rug in a Christmas photograph one informant, Eugene Bachman, shared. Fragments of floor tile (Table 1) and some unpainted pieces of concrete had remnants of an adhesive on them. Tile would have helped moderate the temperature of the floor. The tile appears in the kitchen-dining room in a photograph of a Tin City family eating dinner (LinC 1947:91) and several of the former Tin City residents remembered tile in the units. In both photographs, the only two identified to date of the interior of the apartments, the walls appear white-washed and without decoration. One informant, Emily Yeiser, recalled being unable to hang pictures on the walls, although she was unclear as to why. The large amount of wall plaster fragments excavated provides an explanation. A coarse plaster filled the wooden frames on the interior of the corrugated steel siding, finished with a layer of finer plaster for the wall surface. It is difficult to pound a picture nail into this kind of plaster without chipping or cracking it. Since they were rental units, residents must have had little desire to risk damaging the walls. Like the concrete floors, the steel and plaster walls must have retained the cold in winter. Multiple Tin City residents stated one heating unit fueled by a propane tank provided warmth in the winter. The units must have felt cold and drafty. The one consolation would have been that the floors must have felt refreshingly cool as heat filled the apartments in the summer with the sun baking the steel walls and roofs and no air conditioning unit to cool them. Nancy Glackman related her alarm at finding a pregnant neighbor lying on the floor of her apartment during the summer of 1953. The prostrate woman explained that she had not fallen, but instead was following her doctor's orders to rest and, presumably, cool down when she felt tired or overheated.

The purpose of the red and orange brick fragments is difficult to determine. None of the buildings constructed on or near the site contain red or orange bricks today, indicating they predate these buildings and so must be associated with Tin City. The small size and rounded edges of most of the pieces also suggest they were present during the destruction of the Tin City units and construction of the new buildings, becoming ground down in the process. One informant, Margaret Kilgour, remembered seeing someone construct a makeshift book shelf with old bricks. Considering the ubiquity of brick fragments across our site, for this to be true, nearly every unit we have excavated must have had such shelves, which residents abandoned upon moving out for the last time in 1962. While plausible, this seems unlikely, so the quest for an interpretation of all the brick fragments continues.

PERSONAL ARTIFACTS

Having completed the project's initial goals of identifying the location of the Tin City units, evaluating their potential for archaeological research, and studying their architecture, the unexpected number of personal artifacts discovered, summarized in Table 2, is opening a new line of research for the project and allowing us to establish hypotheses testable through future excavation. First, however, we must consider two limitations on the material culture evidence. None of the surviving documents mention how Tin City residents disposed of other refuse, but because of its urban location, it seems safe to assume all had access to regular garbage pickup provided either by the university or the city of Evansville. That means any non-architectural personal artifacts must have been lost at some point, slipping behind or underneath furniture or throw rugs. To create access for water pipes, the builders must have cut holes through the cement pads, creating locations where a lost artifact would likely never be found. In one photo Karen Lobeck Brass shared with us that her father took while visiting friends in Oakland City who lived in units identical to the Tin City units, one can see beside the pipe under the sink a garbage can and a number of empty bottles. It is easy to imagine items destined for the trash missing their mark and slipping down the hole the pipe passed through in the cement. The fact that very few glass fragments and no ceramic fragments have joins confirms that what we found are probably errant artifacts that residents failed to dispose of properly or lost by accident.

The other consideration in studying the personal artifacts from Tin City is the challenge of identifying to whom specific artifacts belonged. By 1953, the vast majority who would utilize the GI Bill had completed their education (Altschuler and Blumin 2009:105). At Evansville College, married student vets continued to occupy Tin City units during the latter half of the units' use-life, according to the residents who lived there at the time, although the number dwindled after the mid-1950s. Married faculty who were not veterans replaced the vets, as well as students, both married and single. In the final years of Tin City, several student-athletes took up residence in the units. A few personal artifacts provide tight enough dating evidence to allow us to assign their use either to the veteran or post-veteran population, but most do not. The discussion below attempts to utilize dateable artifacts from the veteran population as much as possible, although there is always the possibility that some artifacts belonged to the post-veteran residents.

Table 2. Categories of Personal Artifacts.

Artifact Class	Artifact Type	Count
Ceramics	Porcelain	3
	White Ware	10
Vessel Glass	Coca-Cola bottle, identification certain / identification probable	35 / 10
	Liquor or beer bottle, identification certain / identification probable	22 / 24
	Milk bottle?	1
	Unidentified machine-made	186
	Liquor decanter	2
Other Personal Artifacts	Toys	3
	Jewelry	4
	Tricycle pedal	1
	Comb parts	12
	Infant-sized barrette	1
	Plastic pump for bottle of window cleaning fluid	1

Despite these significant caveats, it is still possible to explore life among GI Bill vets and their families at Tin City and define two hypotheses for which definitive results must still be determined. The famed photographer Margaret Burke-White laid out two assertions in an article for *Life* magazine published in April of 1947 documenting life in a veterans' trailer park called "Hawkeye" on the University of Iowa campus that was not so different from Tin City. In her article Burke-White claims:

> At Hawkeye, where there are no secrets, no differences, and no Joneses to keep up with, veterans have made cooperation work…Husbands sit with baby when the wives go out to shop or to classes. They hang up wash, take turns at changing baby. With no spare money, veterans' families entertain little. At their infrequent parties they drink coffee rather than liquor. But none of them has much time for parties. Many have outside jobs [1947:109].

In this quote, Burke-White succinctly summarizes two themes that came to dominate popular perceptions of on-campus veteran communities, first that residents sought to suppress differences in gender roles, and second that they downplayed class status, themes that characterized press coverage at the time and still dominate historical discussions of places like Tin City (e.g., Altschuler and Blumin 2009:96-7; Forester 1946:140; Olson 1974:77). Kilgour showed that these perceptions still structured her memories of her time at Tin City, stating, ". . . everyone had so much in common, you know, and no money *(laughs)*." Jene Duvall concurred: "But the thing is, is that like anything else when everyone is very much alike, you're not conscious of being crowded or whatever, it worked out fine. . . ." Other former Tin City residents expressed similar sentiments.

To take gender first, the visibility of each gender differs based on whether one considers the historical or archaeological data. Historians have focused on the impact of the GI Bill on veterans but have paid scant attention to their wives. While men were the primary beneficiaries of the GI Bill, less than 3% of those who participated in the program were women (Olson 1974:43). At Tin City, men seem to have been the exclusive recipients because no source, written or oral, mentions a woman utilizing the bill. In fact, the documentary sources preserve the name of only one female spouse of a Tin City vet, a woman named Loretta Peterson (Evansville Crescent 1946c:1). Women are nearly invisible in the written record.

The archaeological evidence could not be more different from the historical. The Tin City stratigraphic layer produced a piece of a post-war era woman's brooch and a glass bead from a necklace, both discussed in detail below. In addition, two beads from types of women's jewelry further reveal the presence of women. Eleven brightly colored comb teeth belonging to at least three different combs indicate female-gendered toiletry items, according to advertisements from the Tin City period in popular contemporary magazines. A cat-eye frame from a pair of clear plastic sunglasses festively infused with green plastic speckles testifies to a female presence. A small plastic pump retained its patent information, "CALMAR CO. PAT. 2362080," making it possible to trace it to its use in cleaning product bottles made of glass, especially the window cleaner "Windex." Advertisements from the time for Windex in popular magazines show only women using the product. The only male-gendered artifact uncovered is part of a black comb, a color of comb associated with men in contemporary magazine ads. This dearth of male-gendered artifacts suggests the Tin City men spent a great deal of time outside the home in class, studying, and at work, leaving the housework and childrearing to their wives. Some of the Tin City residents, particularly spouses interviewed together, confirmed that women spent most of the time in the units while their husbands spent very little. At the only other excavation of campus housing reserved for veteran-students, that at Santa Clara University, excavators found a mixture of male and female-gendered artifacts, with the male artifacts predominating (Skowronek and Hylkema 2010:201-204), a very different pattern from Tin City. Future research may clarify whether practice on the two college campuses really differed, and the situation at Tin City differed from that described by Burke-White at Hawkeye, or whether the pattern at Tin City is simply a result of chance in the artifacts uncovered so far.

Answers to the question of whether Tin City residents suppressed class differences, as Burke-White and former residents suggested, cannot yet be conclusively answered, but some tantalizing clues offer a tentative answer and suggest further evidence remains in the ground. Despite the very common claims in the popular press and by Tin City residents that everyone was "poor," several fragments of porcelain as well as a delicate tea cup handle with gold paint suggest attempts to create a counter-narrative. Tin City residents understood that they could express class standing through dishes, something one of the people interviewed states in an oblique way. Robert Duvall, who lived at Tin City between 1947 and 1950 (Figure 5), discussed fears the government would draft vets back into service because of a looming war with the Soviet Union. Fortunately, neither the war nor the draft ever came to pass, but in mentioning these fears, Duvall explained that if he was going to return to the military, he wanted the elevated status of an officer, not that of an enlisted man, which he held during World War II. He explained these class differences using the analogy of dishes:

Duvall:	…I decided that I wanted to eat off of a plate and have silverware instead of that tray that I'd been eating on for three and a half years and I said the only way to do that's to go to college and get my degree and go on. And… [long pause]
Interviewer:	…be an officer.
Duvall:	mm-hmm, 'cause I was gonna eat off that plate. Now that's a stupid way to put it, but that's exactly my feelings.

Duvall clearly understood that putting out porcelain or a cup decorated with gold paint signaled an elevated status. Tin City residents mentioned frequently that their main source of entertainment was playing cards at each others' apartments. Placing refreshments out on these occasions in a porcelain dish or serving coffee in a fine cup were subtle statements of class aspiration. Beer and liquor bottle fragments make a similar suggestion. Assigning them to a specific population remains a problem, as all could date to any moment during the use-life of the units. Two pieces of liquor decanters are intriguing, however. The vets or their wives may have brought out the decanters during their card games, thus quietly but assertively demonstrating their intentions for a higher status.

Figure 5. Robert and Jene Duvall with their children Diana and Dennis standing in front of their Tin City apartment in 1947. Photo courtesy of Robert and Jene Duvall.

Two pieces of women's jewelry may provide other clues to status aspiration and deserve a more in-depth discussion. The Tin City stratigraphic layer produced a transparent, prong-set, red oval rhinestone at the end of a long, thin, gently curving, gold-plated tine (Figure 6). The rhinestone's long axis fits the jeweler's unit of measurement of SS50, being a little under 12 mm, and its cut is either known commonly as "fancy" or by its Swarovski cut number, 4210. A hinge on the back shows this was part of a brooch. Although quite fragmentary, this piece of costume jewelry provides a tight date. American-made gold and gold-plated brooches decorated with rhinestones imported from Czechoslovakia, Germany, Japan, or Austria experienced an enormous growth in popularity beginning in 1947, providing a *terminus post quem* for the Tin City piece (Carroll 2010:25). Rhinestones remained common in jewelry but by the mid- to late 1950s, jewelry manufacturers had abandoned attempts to make their jewelry look like real gold and gems and instead mixed colorful plastic with rhinestones to create large, loud works (Carroll 2007:30). The hinge on the Tin City example is soldered to the back, a practice that became less common during the mid-1950s as manufacturers found it cheaper to attach the clasp to a plate and rivet the plate to the jewelry (Carroll 2007:25). This piece, therefore, probably dates to between 1947 and the mid-1950s. One other clue suggests a date closer to 1947. Measuring 1.7 cm, the tine is unusually long. Its great length is what allowed it to catch on something and snap off. Such long tines are typical of the brooches sold in 1947. As jewelry manufacturing began to ramp back up after the war, rhinestones and gold were hard to come by. It was not until 1948 that gold became easier to obtain and foreign manufacturers could once again meet the American demand. To make the most of the limited number of rhinestones and gold for plating, in 1947 manufacturers had to adapt. The Coro company, for example, sold a series of "wire work" brooches that allowed them to stretch their limited resources. Their fanciful wire designs imitated the appearance of monkeys, birds, floral arrangements, and other natural designs. By placing single rhinestones at the end of a long tine, they were able to suggest the animal's head or the blossom of a flower at the end of a gently curving neck or stem (Carroll 2007:62). As rhinestones became more plentiful in 1948, jewelers encrusted their pieces with the imitation gems, using short tines or attaching them directly to the piece. The artifact in Figure 6 certainly dates to between 1947 and the mid-1950s with a date closer to 1947 likely. Perusing collectors' catalogs of post-war costume jewelry, it is clear they were large and hard to ignore. Fashion maven Georgie Henschel advised women in 1951, "it is always more effective to wear one good or striking piece of jewelry than to decorate oneself like a Christmas tree" (quoted in Cox 2010:118). Whichever Tin City woman wore this brooch, she clearly was not trying to fit in with the perceived collective poverty of her neighbors, she was making a tasteful statement about her desire for an elevated status.

Figure 6. Portion of a costume jewelry brooch, 1947-1950s (TC 0017). Photo by the author.

A tiny necklace bead provided a more subtle statement of class. Excavators working in Area 3 found the tiny white glass bead in the shape of a corncob (Figure 7). The shape is so unique that it proved easy to trace. Ethnic Germans made these beads in the Bohemian region of Czechoslovakia before World War II exclusively for export to New Orleans (Wilkie 2014:177). Mardi Gras Krewes, which at the time preferred Czech glass beads that looked like natural nuts, seeds, and corncobs, purchased these beads to string onto necklaces (Francis 1979:12). During Mardi Gras parades, Krewe members tossed the necklaces to women in the crowds. On either side of World War II, people in New Orleans would donate the beads they caught during parades to Catholic orphanages, where children would restring the beads and sell them back to Krewes as a fund-raising strategy (Wilkie 2014:75). While the Tin City bead must have been manufactured in or before 1938, it could have recirculated in several Mardi Gras parades for quite some time. An expert on the archaeology of Mardi Gras, Laurie Wilkie, documented the reuse of beads for up to 30 years. Wilkie also confirmed that the Tin City corncob bead was indeed a Czech-made Mardi Gras bead (Wilkie, personal communication). The finding of a Mardi Gras bead at Tin City indicates a woman resident went to New Orleans during Mardi Gras, no doubt accompanied by her husband. She must have returned with at least one necklace. If she chose to wear it in the presence of other Tin City residents, it must have appeared to be a cheap bauble except to anyone who understood its origins, in which case it represented the resources available to this couple to travel all the way to New Orleans to participate in the Mardi Gras celebration. A trip from Evansville to New Orleans during Mardi Gras was a luxury as is proved by a promotional contest held by local car dealerships in 1955, the prize for which was an all-expense paid Mardi Gras trip (Evansville Crescent 1955:6).

Figure 7. The corncob Mardi Gras bead (TC 0933) excavated in Area 3. Photo by the author.

One informant remembered noticing when someone, particularly a woman, violated the expectation of conformity and shared poverty. Jene Duvall (Figure 5) told the following story about fellow Tin City resident, Ann Daugherty, who was married to a French professor, Thomas William "Bill" Daugherty (Figure 8). The Daughertys had met while he was stationed in France, Ann's native country. Duvall said of her:

> ". . . she had an attitude that we thought was very different than most gals at that time. Whenever her husband bought something for himself, or did something for himself, she made sure that she did that same thing for herself and that was very, that was not in keeping with the way women in those days, or at least women in my group felt, we didn't do that, but it was a spoken thing that she did. And she made no bones about it. . . ."

Duvall explained Daugherty's failure to understand the subculture of Tin City and student-veterans by citing her French upbringing. This, however, did not stop Duvall and others from commenting on her behavior, as it became "a spoken thing."

Figure 8. Thomas William "Bill" and Ann Daugherty at Tin City in 1947 with children Danny and Christian. Photo courtesy of Robert and Jene Duvall.

We will continue excavation to attempt to test the hypotheses outlined above that gender roles differed between men and women at Tin City and that shared poverty was an ideal some women did not accept. Area 3 has proven rich in personal artifacts, which is why we will continue working there in the fall of 2021 with the goal of taking the existing trenches down to sterile soil. Once the work in Area 3 is complete, we will open a new area of excavation between the front doors of two units that faced one another. Residents told us this was a common space for socializing and for individual or collective childcare. We hope to discover whether a different pattern of artifact deposition dominates in this area, either challenging or confirming our hypotheses about gender roles and class distinctions. Since the area was one place children congregated, we also hope to find more artifacts associated with the younger age group, allowing us to expand our focus to include all of Tin City's residents. Comparing deposits from inside and outside the units was the intent of the excavation in Area 2 but, as explained above, it proved too disturbed by post-Tin City era activities to provide much useable evidence. Because of constraints on time imposed by the linking of the excavation to the teaching of a college course, it is expected that the goals outlined here, while modest, will require much more time than the typical excavation requires. It is our hope that once we have met these goals, we will publish a full, technical report that is accessible to non-experts. While including all the detailed data and the interview transcripts would be ideal, it might be more practical to seek a hybrid publication with much of the raw data presented online.

PEDAGOGICAL ROLE OF THE TIN CITY PROJECT AT THE UNIVERSITY OF EVANSVILLE

While the Tin City excavation is a research project, it serves other functions as well. Archaeology majors provide the labor on site. For many, this is their first experience working on an archaeological excavation. Those who go on to attend field schools are able to assume leadership roles thanks to their experience. Some students, however, would never be able to get field experience if it were not for the Tin City course because they lack the financial resources to attend a field school during the summer or have personal or family situations that do not permit them to be away from home for the requisite period of time. In addition, while about half of the university's archaeology majors continue in the field, others have gone on to use the skills and modes of thinking and analysis they learned as archaeology majors to launch successful careers as lawyers, entrepreneurs, CPAs, editors, publishers, librarians, and other professionals. One alumnus is even an emergency room nurse, a profession for which he felt well-prepared with his archaeological education. For many of these people, their participation in the Tin City project will be the only first-hand experience they get in the field. Nonetheless, it tends to foster a life-long interest in their study of the material culture of the past and a commitment to supporting archaeological causes.

The Tin City project has also proven an excellent medium for reaching out to non-archaeology students on campus and the general public in Evansville and for building community. Every season student-excavators lead tours of the site for those living both on and off campus (Figure 9). Hundreds have attended these events over the years. Project participants have also worked with local schools, a variety of scout troops, and the on-campus chapter of College Mentors for Kids to teach people in Evansville about archaeology and the surprising, to them at least, evidence for the past hidden directly under their feet. With the advent of COVID-19, outreach efforts have shifted to Zoom presentations, with 150 attending such events during the Fall 2020 semester. Thanks to these efforts, the ethic of conserving archaeological resources has slowly seeped into campus culture. In 2017, when plans for the construction of a meditative labyrinth and drive, which would result in the destruction of the archaeological site, became public, a Change.org petition drive netted 1,000 signatures in just 48 hours, leading to a hold being placed on the plans. For the first time ever, in the spring of 2019, representatives from the University of Evansville Student Government Association contacted the department to discuss the best location for a planned construction project, posts for a "hammock village." They specifically mentioned the Tin City educational campaigns and wanted to avoid any potential archaeological remains and the destruction of the university's heritage. In addition, so many non-archaeology majors have attended the tours or heard about Tin City from friends and classmates that it has become part of the campus identity. In the fall of 2019, someone stole an educational banner displayed on the fence surrounding the excavation. After an appeal for its return, the search for the purloined banner became a main topic of conversation on campus. Many expressed indignation that someone would disrespect institutional history and undermine the work of their fellow students in this way. When the banner reappeared in the grass near the scene of the crime, congratulatory notes and emails from students, faculty, staff, and administrators flooded the department. Even the university president sent a handwritten notecard. The episode made such an indelible impression on the students that during the following semester when student groups competed in an annual Greek-life charity event presenting skits and musical numbers, one team won over the audience of fellow students with a spoof of the old Saturday morning cartoon series *Scooby-Doo*, in which Scooby, Shaggy and the gang searched for the missing Tin City banner. The project has become much more than just an excavation and is offering a platform to educate the university and Evansville communities about the value and techniques of archaeologists. It is also bringing to light aspects of our collective past not contained in the written record. In doing so, the Tin City project has added to the collective university history and identity.

Figure 9. University of Evansville archaeology majors Wajd Alzakwani (left) and Suad Alharrasi (right) demonstrate screening to Tin City site visitors (left to right) Susan, Rachel, and Rick Neupert during Homecoming Weekend, 2019. Photo by the author.

CONCLUSION

The University of Evansville's Tin City project is unlike any other excavation in the country because of its combination of an under-studied subject matter, its focus on pedagogy and community-building, and its longevity. To date the project has been able to locate the original positions of the Tin City units on the University of Evansville campus and determine that despite work crews systematically demolishing the buildings and removing their component parts, much evidence remains. The largest number of artifacts relate to the architecture of the buildings. The shoddy construction technique of some parts of the cement pads testifies to the speed with which workmen constructed the units and, perhaps, their inexperience, either or both a consequence of the post-war building boom. Mismatched ceramic drain pipes also suggest a lack of materials provided by any one company, no doubt because of the enormous demand for building materials. The discovery of cement pads at Tin City helps us imagine the haptic way people interacted with the architecture, welcoming the cool feel in the summer months and shunning it in the winter with throw rugs. Personal artifacts offer a peek into the subculture of student-vets and their families at Tin City. Based on the limited number of artifacts related to gender, we may hypothesize that women played a key role in raising the children and keeping the home while men spent a great deal of time away, a pattern that counters popular perceptions about the equity of gender roles in student-vet housing. Likewise, while many student-vets and their wives suppressed expressions of class difference, a few ostentatious artifacts indicate not all shared this ideal. Conclusions about attitudes toward gender roles and class distinctions are only preliminary; however, with the hope that future discoveries at the site will offer either confirmation or challenges to them. While for normal projects, accomplishing these goals could be done in a field season or two, for the reasons of pedagogy and the university schedule, this will be a multi-year project.

Both the pedagogical goal of the project and the goal of raising community awareness of both the university's past and the role of archaeology in uncovering that past have been successful, and we intend to continue these activities. Because of the intense interest in the project from non-professionals, it would be nice to publish a full technical report in book form, written in a style that would allow novice archaeologists and those interested in the university's history to understand methodology and results. Although the project is unfolding at slower than normal pace, it continues to yield results. Despite the passing of the generation who lived in Tin City, their story is now being rediscovered, preserved, and made a permanent part of the history of the city and the University Evansville.

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OF MARSHES, MORAINES, AND SAND DUNES: NEW PERSPECTIVES INTO HISTORIC AND PRECONTACT SETTLEMENT PATTERNS FOR BENTON, JASPER, AND NEWTON COUNTIES, INDIANA

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[NOTE- At the time this article was written, all authors were with Ball State University.]

ABSTRACT

Since 2014, the Applied Anthropology Laboratories of Ball State University has conducted archaeological reconnaissance survey of over 5,300 acres in Benton, Jasper, and Newton counties, Indiana, as part of a series of Historic Preservation Fund Grants administered through the Division of Historic Preservation and Archaeology. Although individual grant results are reported in separate technical reports and *Indiana Archaeology* articles, this study combined project results and incorporated previously known data from these counties to explore potential patterns in the distribution of historic and precontact resources across a portion of northwestern Indiana's glacial landscape. Combined analysis demonstrated that certain landforms, especially moraines and outwash/till plains, were favored settings for occupation/utilization. Moraines also appear to have been especially attractive to Paleoindian groups. Sand sheets, which formed as a result of complex aeolian–or wind-blown–sedimentation throughout the Holocene, are under-represented in the archaeological database. Although this under-representation may reflect avoidance of sand sheet landforms by groups, this study suggests that a more plausible explanation is that post-depositional processes are hiding a portion of the archaeological record.

INTRODUCTION

Over the past three years, archaeologists at the Applied Anthropology Laboratories (AAL) at Ball State University have conducted ~2170 hectares (~5360 acres) of pedestrian survey in Benton, Jasper, and Newton counties, Indiana (Figure 1). Survey was conducted in support of six Historic Preservation Fund (HPF) grants awarded to AAL by the Division of Historic Preservation and Archaeology (DHPA). Awarded grants included two for Benton County (FY2015, Grant #18-15FFY-03; FY2016, Grant # 18-16-FFY-03) (Balough et al. 2016; Balough et al. 2017; Nolan et al. 2019), one for Jasper County (FY2014, Grant #18-14-FFY-02) (Macleod et al. 2015; Macleod et al. 2017), and three for Newton County (FY2014, Grant #18-14-FFY-03; FY2015, Grant #18-15-FFY-05; FY2016, Grant #18-16-FFY-04) (Clark et al. 2017; Clark et al. 2018; Leeuwrik et al. 2015, Leeuwrik et al. 2016, 2018; Leeuwrik et al. 2017). Combined, surveys recovered 1,102 precontact/protohistoric and 10,008 historic artifacts from 587 archaeological sites.

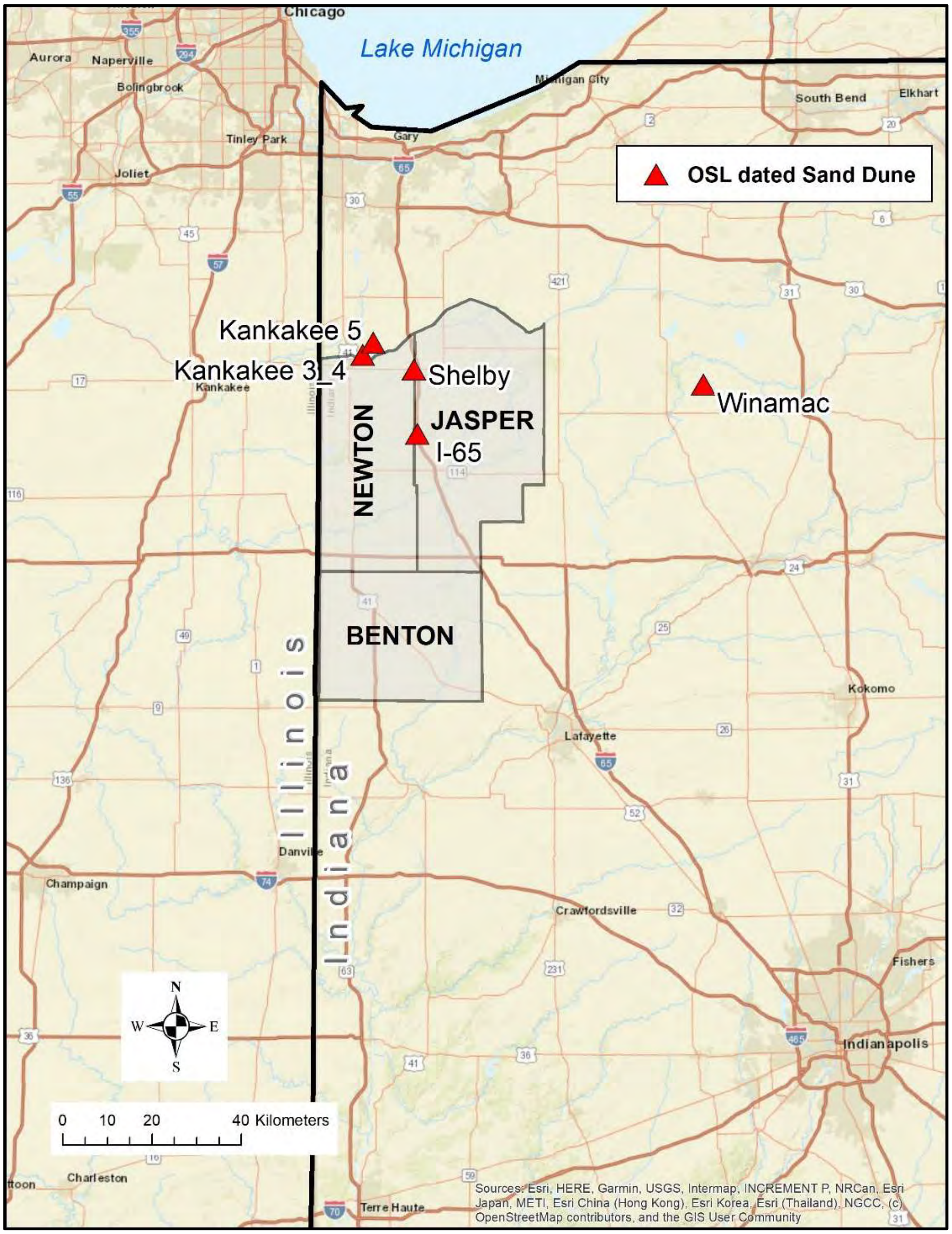

Figure 1. Location of Project Area (Benton, Jasper, and Newton counties) in northwestern Indiana. Red triangles mark locations of Optically Stimulated Luminescence (OSL) dated sand dunes discussed in the text that show Holocene movement (Kilibarda and Blockland 2011).

The primary goal of the AAL's HPF grants is to increase our knowledge of precontact and early historic life in northwestern Indiana, especially in counties of limited or poorly disseminated archaeological data. These surveys have increased the inventory of archaeological sites in the SHAARD database, resolved some SHAARD inconsistencies, and provided a general refinement of local cultural chronologies. Although various AAL technical reports and journal articles already highlight individual HPF grant results (see list above), low site densities and lack of recovered diagnostic artifacts restrict attempts at broad, distributional site analysis in northwestern counties. The purpose of this article is to incorporate previously known archaeological sites recorded in SHAARD with newly recorded sites identified during grant-sponsored AAL surveys to conduct a comprehensive spatial analysis of the distribution of precontact and historic sites in Benton, Jasper, and Newton counties. Considering a combined archaeological database increases the potential of identifying, and interpreting, regional cultural patterns in site distributions across northwestern Indiana. Specifically, all documented archaeological sites are mapped against the backdrop of glacial landforms based in part on a map compiled by Henry Gray and Chris Walls (Gray and Walls 2002). In addition to the spatial analysis, this article provides a cautionary note concerning issues of archaeological site visibility in regions characterized by aeolian (i.e., windblown) sedimentation such as northwestern Indiana. Recent geomorphological studies (e.g., Kilibarda and Blockand 2011) in the eastern U.S. suggest that such landscapes may have buried archaeological resources in settings minimally investigated by archaeologists. This article presents new geochronology data on aeolian landforms in northwestern Indiana that also may cover archaeological materials.

BACKGROUND

To conserve space, omitted from this article are various background data regarding cultural setting, archaeological survey and laboratory methods, artifact descriptions, and individual site discussions. Published elsewhere, this information is in the various technical reports and journal articles listed previously. Instead, this section focuses on how the modern landscape formed over the last 20,000 years, or during the late Quaternary geological period. An understanding of Quaternary geology provides an ethno-ecological context in which precontact (and historic) occupants operated and made decisions. In addition, Quaternary geology has important archaeological implications concerning post-abandonment site visibility and preservation issues.

The combination of underlying bedrock and unconsolidated glacial deposits (primarily those of the last 20,000 years) shaped the landscape that was home to early historic and precontact groups. The project area occupies a major drainage divide with surface water draining toward either Lake Michigan to the north or the Ohio River to the south (Gutshick 1966:10-17; Schneider 1966:54). Precontact populations undoubtedly recognized this unique geographic position as it would have facilitated travel in various directions along river corridors.

Extensive deposits (up to ~450 feet) of unconsolidated glacial drift overlie bedrock in the project area (Gutshick 1966:5; Indiana Geological Survey 2015). Northwestern Indiana glacial drift represents material from two glacial sheets that merged, including the northerly Lake Michigan Lobe and northeasterly Huron-Erie Lobe (Fullerton 1986:26) and include the Atherton, Largo, Martinsville, and Trafalgar Formations (Wayne 1966:26). Significantly, surficial deposits in northwestern Indiana contain a variety of source materials, including glacial (non-local) cherts used by Native Americans to manufacture tools. Several Mississippian and Silurian bedrock chert sources also would have been available to local groups immediately south of the project area, including Attica, Liston Creek, and Kenneth (Cantin 2008).

Northwestern Indiana is part of Till Plain physiographic section, a glaciated region characterized by relatively level topographic relief and dissected river valleys (Fenneman and Johnson 1946). Further division of Indiana into meaningful spatial subunits based on natural features (e.g., landforms, depositional environment, soils, biotic zones, glacial geology, etc.) are available and provide varied results, some that overlap and are confusing (Gray 2000; Homoya et al. 1985; Malott 1922; Schneider 1966; etc.). For mapping archaeological sites, the maps of Gray (2000) and Gray and Walls (2002) are most relevant concerning glacial landform types, including moraines, eskers, outwash plains and drainages, and aeolian landforms (i.e., sand dunes). Gray (2000) maps the project area as within the Kankakee Drainageways to the north and the Iroquois Till Plains to the south. In general, these landforms consist of broad belts of coarse outwash and lake plains, low-lying wetlands and marshes, and aeolian (windblown) dune fields. Dune fields align roughly east to west and generally are low with none higher than 1.5 m (Wayne and Zumberge 1983). Dunes, colloquially referred to as “sand hills” by local residents, often are associated with seasonal wetland/marsh areas and were the focus of intensive precontact occupation (e.g., Surface-Evans 2015). Over the last 12,000 years prevailing westerly winds transported, or molded, the upper-most portions of these sand hills (Schneider 1966:52; see also Kilibarda and Blockland 2011). As discussed below, Holocene movement of these windblown sediments has serious implications for archaeological interpretation of site patterns in northwestern Indiana.

METHODS

Prior to the start of HPF grant work in 2014, AAL compiled a list of previously identified archaeological sites in Benton, Jasper, and Newton counties as recorded in the SHAARD database. From this original compilation, a modified database was created for this study that includes sites with adequate temporal and spatial information to allow for plotting, and analysis of potential distributional patterns in ArcMap 10.4.1. Since many sites contain evidence of multiple temporal occupations, the archaeological record was analyzed within the context of 'components,' or individual occupations that span a distinct period. For example, for site 12Bn93, which records Late Archaic, Late Woodland, and historic artifacts in the SHAARD database, this study creates three separate records with each representing the individual temporal component. This approach facilitates mapping (and discussion) of individual components apart from sites and has been successfully employed previously (e.g., Nolan 2014).

Next, this study creates a detailed glacial landform map by overlying a 1:24,000 topographic contour, or isoline, map over Gray and Walls' (2002) geologic glacial map. This approach allows for the refinement of the Gray and Walls (2002) map to best define glacial landform elements present in the study area. In northern Jasper and Newton counties, for example, review of topographic contour lines clearly shows broad bands of east-west trending parabolic sand dune fields (see also Kilibarda and Blockland 2011). Gray and Walls' (2002) 'sand dune' map unit for this area also shows these features; however, their map under-represents the full spatial extent of these landforms. Since raised sand dunes have been suggested to have attracted precontact and historic populations in northwest Indiana (e.g., Surface-Evans 2015), accurate mapping of these landforms and their respective archaeological components is necessary to assess interpretations of past settlement patterns. Table 1 defines the final landform categories employed for this study.

Table 1. Landform Types used in this Study (based on Gray and Walls 2002).

Landform (% coverage in project area)	Original Gray and Walls 2002 Map Unit, *symbol*	Depositional Setting	Landforms	Possible Benefits
Sand dune (4)	dune sand, *s*	Aeolian	Moderate-relief, dunes (most parabolic in shape)	Well drained, dry locations, broad viewshed
Sand sheet (22)	Blanket sand, *bs*	Aeolian	Low-relief, inter-dunal sand sheets	Level topography, well drained
Moraine (18)	loam till, *tb/m*	Outwash	Moderate- to high-relief, ridge-like landforms	Well drained, dry locations, broad viewshed
Outwash/till plain (48)	clay-loam to silt-loam, *tw*; clay-loam to silt-loam till, *mw*; ice-contact stratified drift, *g*; outwash-fan deposits, *of*; undifferentiated outwash, *o*; mixed drift, *tg*	Drift	Various low-relief landforms, all generally featureless	Level topography, abundant raw materials for tool production
Wetland (1)	muck, *m*	-	Wetlands or marshes	Wetland ecosystem and associated resources
Lacustrine sand (7)	lake sand, *ls*	Lacustrine	Sand deposits associated with ancient lakes	Level topography, well drained

Archaeological components possessing enough data to assign both a temporal affiliation (e.g., Late Archaic) and geographic position via Universal Transverse Mercator (i.e., UTM) coordinates were plotted on a combined glacial-topographic contour map to determine what type of landform each component was located upon. Following landform classification, a map was created that compared the current HPF-generated data with previously recorded component information. Next, the combined component database was used to compare general historic versus precontact component spatial distributions. Finally, precontact components with detailed temporal information (e.g., Archaic) was mapped and analyzed to determine any temporally specific trends.

RESULTS

For this study, the combined pre-2014 SHAARD database for Benton, Jasper, and Newton counties yielded only 95 previously recorded archaeological components with adequate temporal and spatial information to allow for plotting and analysis in ArcMap 10.4.1 (Figure 2; Table 2). AAL-managed HPF surveys increased this component total to 642, which represents a ~574% increase over initial SHAARD frequencies. With the exception of the wetland landform type, AAL's HPF surveys substantially increased the number of components in all landform types for the project area (Table 2).

Table 2. Frequency of Previously Recorded Archaeological Components and Newly Identified HPF Components in Benton-Jasper-Newton Project Area by Glacial Landform Type.

Landform (% coverage in project area)	Previously Recorded Components (%)	HPF Components (%)	All Components (%)
Sand dune (4)	1 (1)	22 (4)	23 (4)
Sand sheet (22)	2 (2)	17 (3)	19 (3)
Moraine (18)	35 (37)	115 (21)	150 (23)
Outwash/till plain (48)	45 (47)	374 (68)	419 (65)
Wetland (1)	1 (1)	-	1 (<1)
Lacustrine sand (7)	11 (12)	19 (4)	30 (5)
Component Total	95	547	642

When proportions of previously recorded and HPF archaeological components are compared directly (see Table 2), some variation between the two is evident. First, the relative proportion of HPF components on outwash/till plain landforms is higher than previously identified components. This increase likely reflects increased sampling of agricultural fields within outwash/till plain settings by AAL personnel. Conversely, the relative proportion of HPF components on moraines (21%) shows a marked decrease over previous recorded patterns (37%). Again, this decrease may reflect survey bias, as prominent elevated moraines likely were collected/surveyed more intensively by avocationals and professionals than adjacent, lower flat landforms. Similarily, there is a slight decrease in the relative proportion of archaeological components found on lacustrine (i.e., lake plain) sand landforms during AAL's HPF surveys. Finally, component proportions for sand dunes, sand sheets, and wetlands show no obvious patterns between previously recorded and HPF archaeological components.

The distribution of archaeological components by glacial landform (Figure 2) shows that many components spatially 'cluster' on certain landscape positions. Although clustering undoutedly is strongly biased by the shape, size, and distribution of AAL's HPF survey areas, these surveys clearly were successful in increasing the overall number of components for nearly all landform types. Such an increase in component frequencies allows for a more detailed analysis of potential cultural patterns.

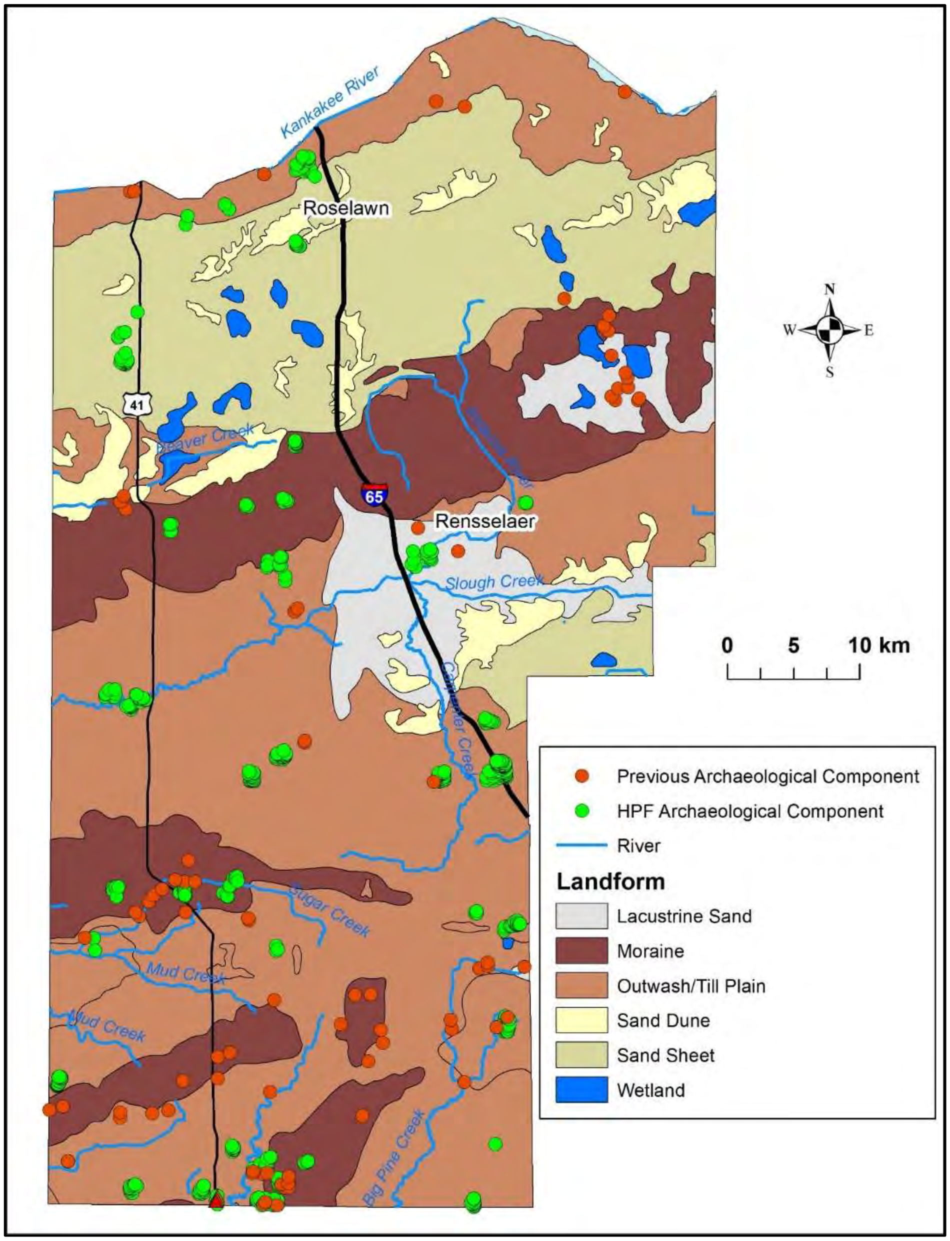

Figure 2. Distribution of previously recorded archaeological components and newly identified HPF components within the Benton-Jasper-Newton project area. Landform types based on Gray and Walls (2002) as modified through inspection of 1:24,000 scale topographic map.

Table 3 and Figure 3 provide the combined archaeological component database by broad temporal period (historic versus precontact) and by landform type. Again, with the addition of newly identified HPF components, the combined Benton-Jasper-Newton SHAARD database demonstrates a broad coverage of all glacial landform types. Interestingly, relative proportions of historic and precontact components by landform type are nearly identical in distribution, although slight variations do occur such as within the sand sheet unit where historic components are slightly better represented than precontact components. This parallel owes to the fact that a large percentage of identified HPF archaeological sites were multi-component, containing evidence of precontact and historic occupation or utilization.

Table 3. Combined Frequency of Archaeological Components in Benton-Jasper-Newton Project Area by Temporal Period and Glacial Landform Type.

Landform (% coverage in project area)	Historic Components (%)	Precontact Components (%)	All Components (%)
Sand dune (4)	12 (4)	11 (4)	23 (4)
Sand sheet (22)	15 (4)	4 (1)	19 (3)
Moraine (18)	80 (23)	70 (23)	150 (23)
Outwash/till plain (48)	225 (66)	194 (65)	419 (65)
Wetland (1)	-	1 (<1)	1 (<1)
Lacustrine sand (7)	10 (3)	20 (7)	30 (5)
Component Total	342	300	642

Before AAL's HPF surveys, Benton, Jasper, and Newton counties had only 25 precontact components in the SHAARD database with adequate temporal data to identify a specific occupation period. This included 6 Paleoindian, 5 Early Archaic, 4 Middle Archaic, 1 Late Archaic, 3 Early Woodland, 2 Middle Woodland, 2 Late Woodland, and 2 general 'Woodland' components. The HPF surveys added an additional 20 components to this inventory, including 4 Early Archaic, 2 Middle Archaic, 8 Late Archaic, 3 Late Woodland, and 3 Late Precontact/Mississippian. The distribution of the combined database (45 components) by broad temporal period is provided in Figure 4. The small number of documented diagnostic artifacts in these data, even with the addition of HPF survey information, makes it difficult to recognize meaningful patterns within individual temporal periods. Simply put, archaeological interpretations of the spatial distribution of precontact components continues to be hampered by a restricted number of components with good temporal control. It is important to note that documentation of local avocational artifact collections as part of AAL's HPF work demonstrates that substantial numbers of diagnostic artifacts exist regionally (e.g., Macleod et al. 2015). Unfortunately, private collections often do not make it into the official archaeological record, constituting a lost opportunity to gather critical information about the history of the region. Worse, over time, details on the location of origin for particular collection or artifacts gets lost due to the limits of memory or with the passing of the collector or the dispersal of a family collection. There is ample opportunity for productive collaboration between collectors and archaeologists to fill these gaps in our comprehensive understanding of the history of occupation and land use in the region.

DISCUSSION

The results of AAL's HPF surveys have substantially increased the number of archaeological components/sites for Benton, Jasper, and Newton counties. This increase provides an opportunity to inspect the spatial distribution of components to potentially detect cultural patterns in the archaeological record of northwestern Indiana. Accurate interpretation of spatial distributions among components is difficult, however, given the incomplete nature of the archaeological record. For example, a lack of archaeological components recorded for a landform type could result from:

1. A deliberate cultural choice to avoid disadvantageous landforms;
2. An absence of surveys in the region of the landform type, thus components may be present but not yet discovered;
3. The removal of diagnostic artifacts by collectors who fail to record their findings with the Division of Historic Preservation and Archaeology;

4. Post-depositional processes that bury archaeological material at such depth (e.g., >50 cm) as to avoid detection during typical reconnaissance survey techniques (surface inspection, shovel testing). Thus, depending on the type of survey technique selected for a project, components may remain 'hidden' even after fieldwork.

Additional archaeological testing on sites with limited temporal affiliation is required to fully evaluate which above-listed interpretation best accounts for an observed pattern. This study interprets spatial patterns in the current database as largely reflecting deliberate cultural decisions by precontact and historic populations based, at least in part, on various landscape characteristics. In this respect, the concurrence in landform choice between historic and precontact components is intriguing. Often there are different factors that guide the selection of a place to settle and conduct activities between Native and European communities, especially where the PLSS (Townships, Ranges, Sections, and ¼ Sections) demarcates ownership in historic times. Land grants of ¼ sections often placed Historic period occupations in more diverse settings than the pre-colonial Native locations selected for habitation and activity areas. That early historic settlement in the study area is more aligned with the nature of the landscape, and Native preferences reveal a lot about the nature of early settlement in the area before the establishment of railroads (ca. 1850–1870) and widespread artificial drainage operations. While some of this concordance is explicable by the multi-component nature of many sites found by AAL surveys, examination of Figure 3 shows that many historic sites are found independent of precontact materials but in geologically similar settings. The nature, timing, and extent of this concurrence warrants further investigation.

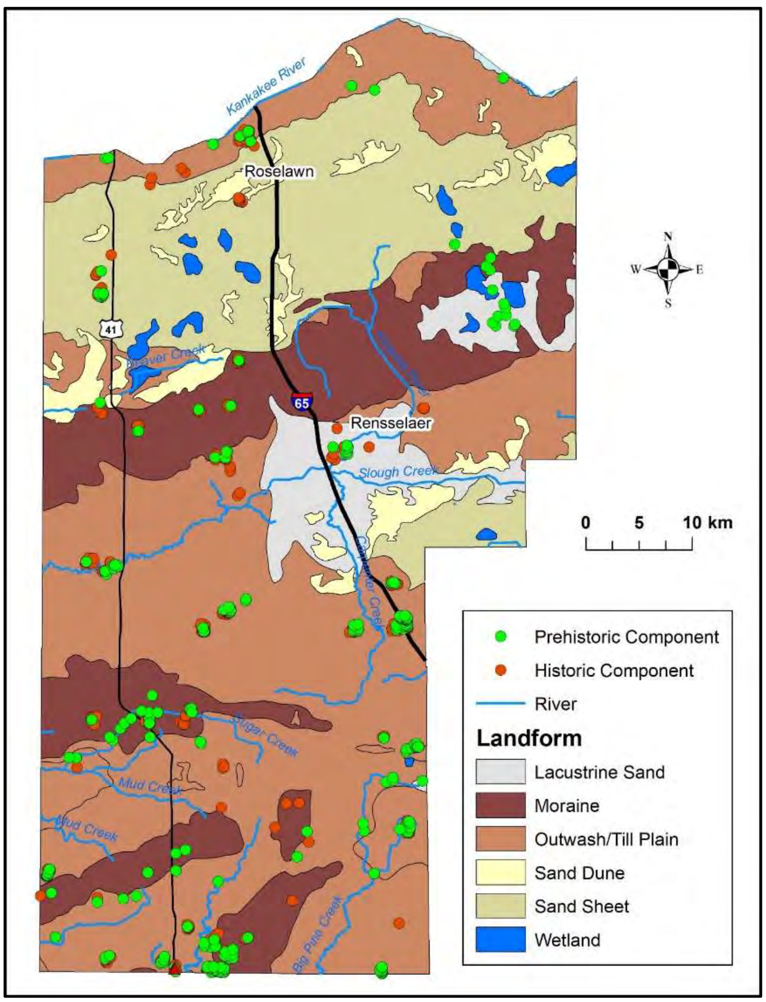

Figure 3. Distribution of archaeological components in Benton-Jasper-Newton project area by temporal period and glacial landform type. Landform types based on Gray and Walls (2002) as modified through inspection of 1:24,000 scale topographic map.

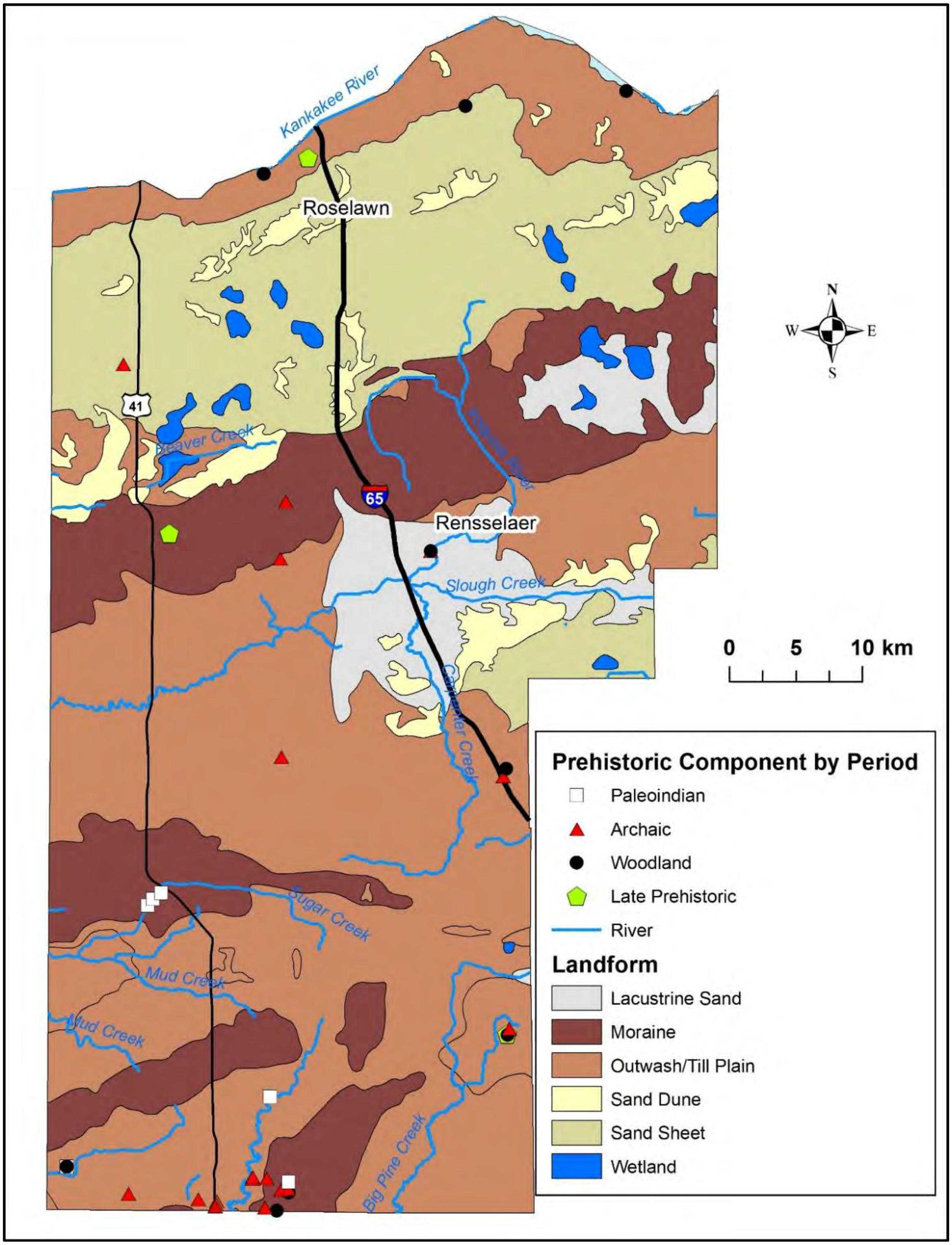

Figure 4. Distribution of precontact components by major temporal period within the Benton-Jasper-Newton project area. Landform types based on Gray and Walls (2002) as modified through inspection of 1:24,000 scale topographic map.

One method to determine if the spatial distribution of components reflects cultural choice or random factors is through comparison of relative component frequencies and relative proportions of landform types within the Benton-Jasper-Newton project area. If human settlement behavior was entirely random in northwestern Indiana, and component burial through post-depositional processes minimal, one would expect that the relative proportion of landform types should roughly equal the relative proportion of archaeological components. For example, outwash/till plain landforms account for 48% of the entire project area. If human settlement was entirely random and irrespective to landform characteristics, then the number of archaeological components on outwash/till plains also should be close to 48%. In instances where relative proportions are substantially lower or higher, then such disparity may reflect deliberate cultural choices such as occupation of favored landscapes or avoidance of disadvantageous landforms.

From data presented above, several general patterns are considered below. Outwash/till plains, which account for 48% of the project area, are over-represented in both precontact and historic archaeological components (65% and 66%, respectively). This trend is noted by others in Jasper County (Smith and Sanchez 2014:272) and may suggest more intensive utilization of this landform type than adjacent landforms. Outwash/till plains are relatively level and contain several well-defined river valleys that provided fertile soils, facilitated travel, and provided various aquatic resources. Another source that may have been prized by precontact groups on outwash and till plain landforms is stone material, especially glacially derived chert used to manufacture tools. Chert cobbles also would have been available on moraines (e.g., Wayne 1956:62), but less so on sand dunes, sand sheets, lacustrine sands, and wetland landscapes.

Moraines, which account for 18% of the project area, are slightly over-represented by precontact and historic components (both at 23%). Moraines represent broad, elevated landforms ideal for both short-term and long-term occupation. Due to their size, good drainage, and high elevation, they likely housed relatively substantial, diverse oak-hickory forest ecosystems (Petty and Jackson 1966), at least during later portions of the Holocene. White (2007:52-53) suggested that moraines in northwestern Indiana contain large (but shallow) sites with low densities of fire-cracked rock and generally larger lithic artifacts. Although the number of Paleoindian components is small (n = 6) for the Benton-Jasper-Newton project area, five components are found on prominent moraines (see Figure 4), which may suggest deliberate occupation as suggested in previous studies (e.g., Smith and Sanchez 2014).

Finally, sand sheets, an aeolian landform especially prevalent in northern Jasper and Newton counties where they account for 22% of the project area, are substantially under-represented in both historic and precontact archaeological components (4% and 1%, respectively) (see Table 3). Previous research on sand dunes and sand sheets in northwestern Indiana indicates often intensive historic and precontact occupations of these sandy landforms, especially in the Kankakee marsh region of Lake County, Indiana (e.g., Bellis et al. 1979; Faulkner 1972; Kullen and Greby 2003; Surface-Evans 2015; White 2007). Collectively, previous research documents that sand dunes and sheets, typically represented as low rises among perennially or seasonally inundated lowlands, often were heavily used by precontact groups, especially during later temporal periods (Late Woodland and Late Precontact/Mississippian). Excavation by Surface-Evans at several sites revealed dense concentrations of features, lithics, fire-cracked rocks, ceramic, and floral-faunal assemblages (Surface-Evans 2015; see also Faulkner 1972). Human burials also are reported from sand dune locations (Bellis et al. 1979:31).

Although it may be tempting to interpret the under-representation of archaeological components for sand sheets in Jasper and Newton counties as reflecting deliberate avoidance of this setting, recent geomorphological research on aeolian landscapes suggests that these landforms potentially blanket and preserve currently undocumented archaeological resources. If true, the under-representation of sites may be due to sampling bias and not human avoidance. In the eastern U.S., these now relict and vegetated aeolian dunes were long thought to have stabilized soon after the Last Glacial Maximum (~19,000 BC) (Muhs and Bettis 2000), and principally before the arrival of Native Americans into North America (Holliday 2004:131). As such, archaeologists traditionally viewed these landscapes as "passive" and with limited potential for containing deeply buried cultural material.

Recent geomorphological analysis in the Green (Illinois) and Kankakee (Indiana) river drainages, however, establish a refined timeline, or geochronology, of aeolian landforms in formerly glaciated areas (Kilibarda and Blockland 2011; Kilibarda et al. 2008; Miao et al. 2010). These studies rely mainly on optically stimulated luminescence (OSL) dating to determine the age at which individual sand grains of quartz or feldspar were last exposed to sunlight. This dating technique allows geomorphologists to determine the age of formation for sand dune landforms.

In addition to these sources, an unpublished geomorphological study in 2017 by the senior author obtained three additional Holocene OSL dates from two aeolian dune complexes in the Kankakee watershed, just north of Newton County in Lake County (profiles Kankakee 3_4 and Kankakee 5; see Figure 1). Kankakee 3_4 derives from a parabolic dune complex located on a low terrace of the Kankakee River at an elevation of 198 m amsl (16T 4558219.5 m N; 465162.7 m E). This dune complex was subject to archaeological survey by James Bellis in the late 1970s that identified the now-destroyed Harper Site (12La202) (Bellis et al. 1979:31). Kankakee 5 also represents overlapping parabolic dunes within a broad outwash paleochannel just north of the current Kankakee drainage at an elevation of 197 m amsl (16T 4561019.04 m N; 467504.39 m E). A brief discussion of OSL ages and stratigraphic descriptions is provided here for the benefit of the archaeological and geomorphological communities (Figure 5 and Table 4). Details on laboratory procedures are found in Purtill et al. (2019) for OSL and particle-size analysis and Nolan and Redmond (2015) for Frequency Dependent Susceptibility ($\chi^{fd\%}$).

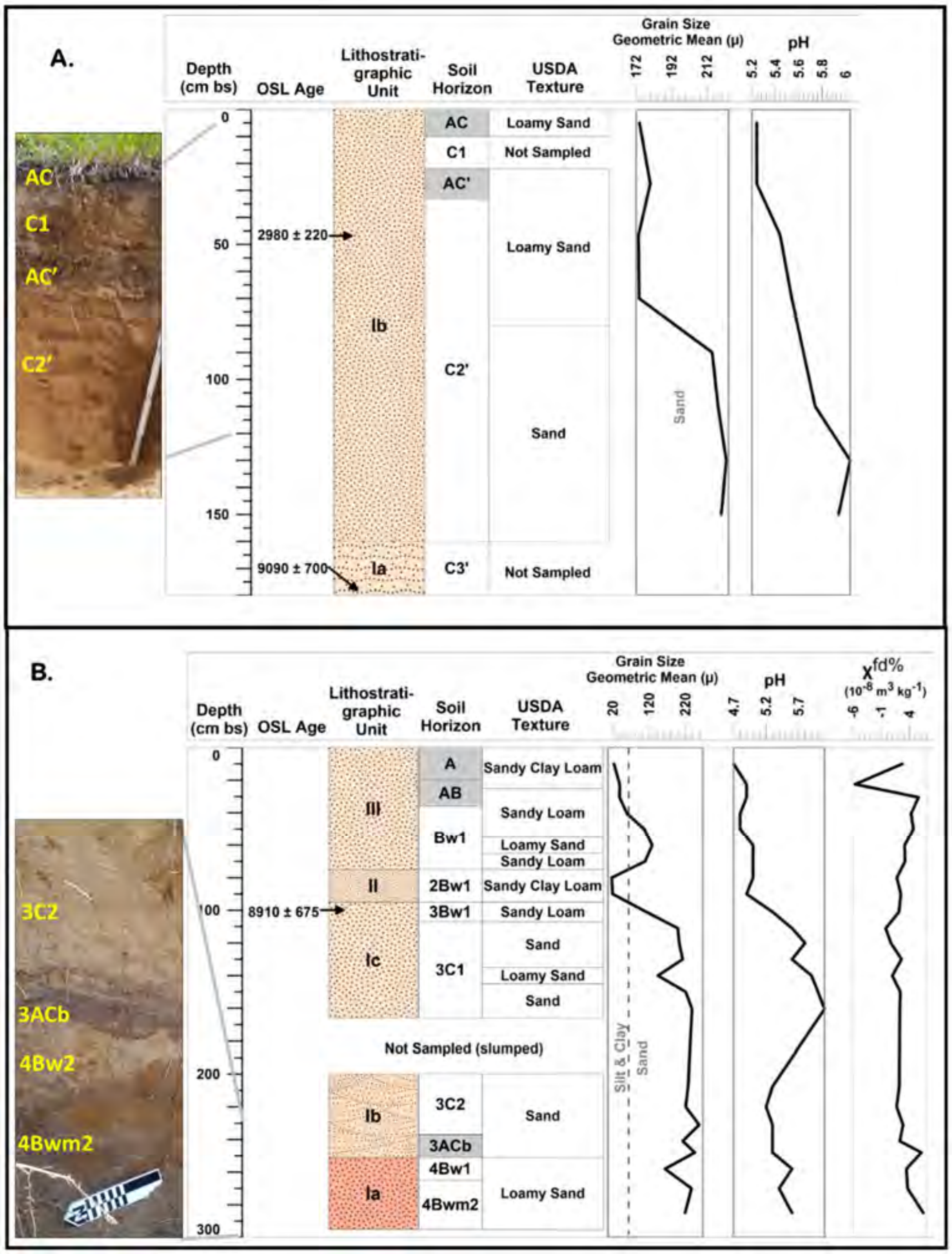

Figure 5. A. Combined stratigraphic column for profiles Kankakee 3_4. B. Stratigraphic column for profile Kankakee 5.

Table 4. Grain and Sedimentary Characteristics of Two Dune Landforms Studied in Kankakee Drainage.

Profile ID	Lithostratigraphic Unit	Grain size median (µm)	Grain size mean (µm)	Dominant texture class	Grain size sorting	Sorting class	Sedimentary structures and comments
Kankakee 5	III	205.36	87.27	very fine sand	8.57	very poorly sorted	massive
	II	158.24	39.95	coarse silt	13.10	very poorly sorted	massive
	Ic	273.49	191.28	fine sand	4.04	very poorly sorted	massive
	Ib	257.23	228.98	fine sand	2.26	poorly sorted	High-angle, planar crossbeds
	Ia	299.20	205.70	fine sand	3.19	poorly sorted	Massive with strongly cemented grains at depth
Kankakee 3_4	Ib	298.53	197.08	fine sand	4.21	very poorly sorted	massive
	Ia	Not sampled					faint lamellae banding

Study of Kankakee 3_4 reveals that the upper 180 cm of sediment in this parabolic dune reflects grain deposition over the last ~9000 years. A rate of deposition calculates to 2.25 cm per 100 years between the depths of 45 and 180 cm, a period that roughly equates to the middle Holocene. Since ~3000 years ago, or throughout the late Holocene, deposition of the uppermost 45 cm of sediment slowed (1.5 cm per 100 years) and a weak, now buried, A horizon developed (AC' horizon), suggesting a short period of surface stability. OSL ages and a buried A horizon indicates that the dune may possess buried archaeological material dating back at least to the Archaic Period.

The profile at Kankakee 5 is more variable than Kankakee 3_4 with multiple lithostratigraphic units (distinctly textured sediment units), suggesting a more complex aeolian depositional history. A single OSL age demonstrates that at least the upper 100 cm of sediment is Holocene with an approximate deposition rate of 1.1 cm per 100 years. To help detect potential buried surfaces within this dune, this study employs low frequency (LF: 470 Hz) and high frequency (HF: 4700 Hz) magnetic susceptibility (MS) (see Figure 5B). The difference between LF and HF is termed Frequency Dependent Susceptibility ($\chi^{fd\%}$) and detects superparamagnetic ferrimagnetic minerals produced predominately by biochemical soil formation processes (Dearing 1999). In other words, $\chi^{fd\%}$ detects minerals that form only during topsoil formation, thus variable 'peaks' in $\chi^{fd\%}$ in Figure 5B potentially reflect episodes of soil formation. A strong peak in $\chi^{fd\%}$ aligns with the modern topsoil (A/AB horizons) and a second peak at 2.45 m bs, coupled with a decrease in texture size and a slight increase in soil pH, is interpreted as a weakly developed buried soil surface (3ACb horizon) that remains undated. Although more restricted than Kankakee 3_4, the upper 100 cm of aeolian sediment at Kankakee 5 is old enough to potentially bury archaeological deposits dating back to at least the Archaic Period.

Significantly, OSL dating of aeolian landforms in northwestern Indiana now demonstrates that many have not remained stable but instead underwent multiple remobilization and migration events during the past 14,000 years. Remobilizations would have been especially active during past periods of prolonged drought (e.g., Booth et al. 2005) where the anchoring effect of vegetation diminished and increased wind velocities (>5 m s^{-1}) mobilized and transported exposed sediments. For instance, the Shelby and I-65 dunes along the border of Jasper and Newton counties (see Figure 1) mobilized at the end of the Pleistocene (~10,000 BC) and again during the middle Holocene (~2500 BC) (Kilibarda and Blockland 2011:316). The Kankakee 3_4 and Kankakee 5 parabolic dunes also show multiple depositional events throughout the Holocene. The realization that mobilization and migration events were common during the Holocene increases the potential that some aeolian landforms such as sand sheets and dunes formed during the Holocene and may cover undocumented archaeological remains.

CONCLUSIONS

Combined results from six AAL-managed HPF grants in Benton, Jasper, and Newton counties have significantly increased our understanding of early historic and precontact land-use behavior for northwestern Indiana. Dominated by glacially derived landforms, some of which were actively modified during periods of the late Pleistocene and Holocene, this region provided multiple, spatially dispersed biomes and resources. Although much of this landscape appears featureless and homogenous to today's casual observer, the results of this study (and others) demonstrate that past historic and precontact populations selected specific landform types to occupy or use. Although the results of AAL's HPF surveys increase the archaeological database for these counties, the number of diagnostic precontact artifacts recovered from well-provenienced locations remains low and difficult to analyze. This is true despite the fact that local avocational archaeology collections document various diagnostic artifact types from all major temporal periods. Future work should focus on increasing the number of dateable components across the landscape so more detailed patterns of past behavior can be better determined.

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THE ORIGIN AND DEMISE OF YANKEETOWN IN SOUTHWESTERN INDIANA

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EVANSVILLE, IN

While working at Angel Mounds in 1938, archaeologist Glenn Black was informed of a previously unreported site adjacent to the Ohio River in Warrick County, Indiana, south-southwest of the small settlement of Yankeetown. The informant, Smith Hazen, noted large quantities of shell tempered pottery on the surface, as well as other materials that were rapidly eroding out of the riverbank. Upon investigation, Black identified the presence of multiple buried components at the site, including a previously unrecognized type of well-made, distinctive grog tempered pottery that was stratigraphically separated from the Mississippian materials lying above (Black 1940:34; Blasingham 1965:1). These early investigations led to the first formal description of Yankeetown ceramics, which was undertaken by Emily Blasingham (1953) and published as her master's thesis at Indiana University.

It has been over 80 years since Black first visited the Yankeetown site (12W1), and though much has been learned since then, there is still a great deal we do not know about the latter portion of the Late Woodland period (ca. AD 700–1100) in southwestern Indiana. The following article is designed as a summary of our current understanding of Yankeetown, with some thoughts on where it came from, what happened to it, and its place in the broader region-wide picture.

HISTORY OF YANKEETOWN INVESTIGATIONS

With few exceptions (e.g., Adams 1949:66-67), early research focused exclusively on the Yankeetown site itself. Between 1938 and 1951, a number of surface collections were conducted at 12W1 by the Indiana Historical Society and interested amateurs, resulting in a collection of over 6,000 Yankeetown sherds. Later, in 1950 and 1951, Glenn Black revisited the Yankeetown site with others and excavated a feature eroding out of the riverbank and a small test pit, both of which produced almost exclusively Yankeetown pottery (Blasingham 1965:3; Curry 1954:12-14).

It was not until the late 1960s, however, that larger-scale investigations were undertaken. Beginning in 1965, the National Park Service funded a series of salvage excavations at 12W1, as the site had been, for many years, eroding into the Ohio River. The damage was to be accelerated by the construction of the Newburgh Lock and Dam, six miles downstream, which was to raise the pool stage by about 12 feet (Blasingham 1965). Four excavation seasons were undertaken, which resulted in the identification of numerous flat-bottomed and bell-shaped pits, hearths, and postmolds (all approximately 0.6-1.0 m below the surface), along with large quantities of Yankeetown artifacts (Blasingham 1965; Dorwin 1967, 1968; Vickery 1970). No discernible structures, however, were identified. Salvage excavations were focused on those areas near the riverbank, with very few data collected on other areas of the site.

Since the 1960s, excavations have been periodically conducted at a number of sites other than the type site, significantly increasing the range of our knowledge. Excavated Yankeetown sites in Indiana include Kuester (12Vg71) (Apfelstadt 1973; Strezewski 2014), Dead Man's Curve (12Po3), Squirrel Hunter (12Po5) (Alt 2010; Alt et al. 2011), and 12Sp29 (Schock 1984). Research on the Kentucky side of the Ohio River has been limited to investigations at the Stull (15Un95) (Ottesen 1981) and Foster sites (15Da68/69) (Sussenbach 1991, 1992). In 1990, Brian Redmond published the most detailed synthesis of the Yankeetown data to date, incorporating information on chronology, subsistence, settlement, and material culture. His work remains the most definitive treatment of Yankeetown culture, though it has been 30 years since the data were compiled.

More recently, Indiana State Museum (ISM) personnel have conducted geophysical investigations and test excavations at the Yankeetown type site, the first in many years, providing us with new data collected with modern recovery methods (Garniewicz et al. 2009; Greenan and Garniewicz 2010). The ISM work at 12W1 resulted in the partial excavation of a burned structural basin, the first Yankeetown structure identified. No posts or wall trenches were identified, though the outline of the basin indicates that it was either square or rectangular in shape. Additional features identified during the ISM work included a shallow cooking pit and a small feature filled with charred corn cobs (Garniewicz et al. 2009).

WHAT IS YANKEETOWN?

In general, Yankeetown bears some resemblance to other Terminal Late Woodland cultures in the Southeast, including Hamilton, McKelvey, and Flint River, in the Tennessee River valley, and West Jefferson in the Black Warrior River valley (Redmond 1990:255), with recognized commonalities in terms of general material culture and subsistence/settlement practices. At its northern extent, Yankeetown sites have been documented from the confluence of the Embarras and Wabash rivers, running as far south as the Ohio/Tradewater river confluence in Kentucky. Yankeetown sites run eastward along the Ohio River to central Perry County, east of the Anderson River confluence (Applegate 2008; Pollack and Henderson 2000; Redmond 1990; Winters 1967). In Indiana, the vast majority of Yankeetown sites have been identified from Posey, Spencer, Vanderburgh, Warrick, and Gibson counties, while those in Kentucky are mostly confined to Union, Daviess, and Henderson counties. Substantial Yankeetown sites do not generally occur east of the alluviated valley portion of the lower Ohio River valley, at which point the Ohio River runs through a gorge-like valley with narrow floodplains (Ray 1974). Approximately 150 Yankeetown components are currently recognized in the three-state area in which they occur.

Settlement data indicate a preference for floodplain ridges, terrace remnants, and natural levees, invariably within one kilometer of stream drainages. Such spots would have been less flood prone and therefore suitable for longer-term sedentary occupation and would have offered ready access to good arable soils and other necessary resources. Variability in site size has been interpreted as evidence for village-, hamlet-, and homestead-sized settlements, though excavated data are generally lacking. Based on ethnohistoric data, Redmond (1990:242-252) suggests that floodplain villages would have likely been occupied from late spring through late fall, with dispersal to terrace and upland hunting camps during the winter. Unfortunately, most of the data regarding the seasonality of any given occupation originate from the type site only, and our information on this question is therefore severely limited.

Similarly, subsistence data are also sparse, mostly due to the fact that many of the larger-scale excavations at 12W1 were conducted during the pre-flotation era. Current research indicates that, before AD 900, residents of the middle Ohio River valley and American Bottom participated in intensive cultivation of Eastern Agricultural Complex (EAC) plants such as goosefoot (*Chenopodium berlandieri*), maygrass (*Phalaris caroliniana*), sumpweed (*Iva annua*) and little barley (*Hordeum pusillum*), and use of wild plant resources, such as nuts. Maize, while sometimes present, does not emerge as a subsistence crop until after AD 900 (Greenlee 2006:217-221; Reber 2006:239). In both instances, the transition seems rather abrupt, at least by archaeological standards.

The presence of maize cultivation has been demonstrated at a number of Yankeetown sites, varying in age from the ninth through the twelfth centuries (e.g., Garniewicz et al. 2009:109; Pollack and Henderson 2000:621; Redmond 1990:191; Sussenbach 1992:114). Unfortunately, there are few data available as to the initial timing and degree of maize utilization at various points during the Yankeetown sequence. The earliest reliable dates for maize use in Yankeetown contexts originate from a small pit feature from the Yankeetown site (Redmond 1990:192). These dates (1220±110 and 1160±120 rcybp) suggest an intensification of maize use as early at the ninth century; however, the large standard deviations for both dates preclude a more precise chronological placement. Overall, it seems most likely that Yankeetown culture predates the intensification of maize agriculture.

Information on Yankeetown EAC plant use has been obtained from 12W1, in a feature radiocarbon dated to the ninth century. Knotweed, goosefoot (both wild and cultivated), and maygrass were recovered from the feature, along with maize remains. EAC plants were, however, four times as frequent, possibly indicating that maize was a small part of the overall diet at this point (Redmond 1990:192). Sussenbach (1992:114) reports the presence of goosefoot, maygrass, and little barley from the Foster site, with both wild and domesticated varieties of goosefoot present in the sample. The Foster site, which dates to ca. AD 1150–1250, suggests a relatively late use of EAC cultigens by Yankeetown peoples. Large quantities of charred nutshell at the Yankeetown site, often in association with fire-cracked rock and oxidized soil, suggest the use of roasting pits as well (Redmond 1990:191). Interestingly, the switch to intensive maize use does not seem to have a profound impact on Yankeetown peoples, at least in terms of material culture. In particular, early Yankeetown ceramics, as far as we know, seem to be very similar to later forms, though admittedly, there are few solid data at this time.

The Yankeetown culture is perhaps best known for its distinctive ceramics, which clearly distinguish this archaeological phenomenon from its neighbors. This distinctiveness has been interpreted as evidence for high levels of intra-regional integration, coupled with considerable inter-regional social distance (Ruby 1997:81). The vast majority of Yankeetown ceramics are grog tempered, with the occasional, possible incidental inclusion of sand and/or grit. By far, most Yankeetown pottery is plain in surface treatment with a high percentage of vessels decorated in some manner. As other authors (e.g., Blasingham 1953; Garniewicz et al. 2009; Redmond 1990) have offered detailed descriptions of the Yankeetown ceramic assemblage, a summary of the data will be presented here.

In short, Yankeetown pottery can be divided into two basic forms: jars and bowls, which can be further subdivided into seven categories: 1) large jars, 2) small jars, 3) straight-sided "shoulderless" jars, 4) miniature jars, 5) rounded bowls, 6) shallow wok-like bowls or pans, and 7) miniature bowls (Garniewicz et al. 2009:77; Redmond 1990:113). There is some suggestion that effigy vessels may have also been manufactured, though their forms are not well known (Dorwin 1968; personal observation). The relative percentage of bowls varies widely by site, with as few as 10% and as many as 62% reported in previous studies. However, as can be seen in Table 1, relative vessel frequency calculations differ quite a bit, even within the same site. This variability may have something to do with the size of the sherds examined, as some calculations were made from surface collected materials, while others were from excavated contexts. Overall, it seems prudent to withhold judgment regarding the significance of any patterns in vessel form frequencies until more consistent information emerges.

Table 1. Data on the Percentage of Bowls and Jars at Various Yankeetown sites.

Site	Number of rims	Percent Bowls	Percent Jars	Reference
Yankeetown	200	49.0	51.0	Redmond 1990
Yankeetown	192	62.4	37.7	Garniewicz et al. 2009:81
Duffy	90	57.8	42.2	Redmond 1990
Duffy	77	32.5	67.5	Current study (USI collections)
12-Po-50	50	10.9	89.1	Redmond 1990
Foster	31	51.1	48.8	Sussenbach 1991:116

Most notable about the ceramic assemblage is the wide variety of decorative techniques employed and the high frequency of their use. These decorative techniques include:

- Fillet – Fillet decoration was executed by applying one or more thin strips of clay to the neck and/or rim of the vessel (Figure 1). The strips were then nicked with perpendicular notch or tick marks along their length. In some instances, the fillet strips appear to have been made by molding the wet surface of the vessel into thin strips. Fillet strips are known from both bowls and jars. Simple fillet designs consist of single horizontal bands. Significantly more complicated examples are known as well (see e.g., Redmond 1990: Figure 3-24).

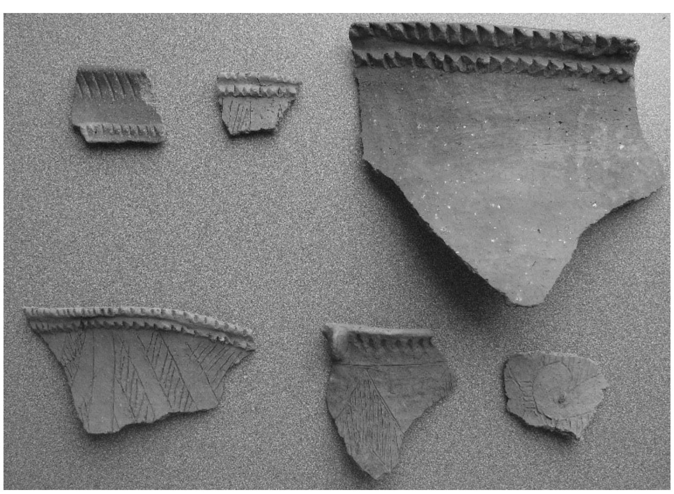

Figure 1. Examples of fillet (top row) and incising (bottom row) on Yankeetown sherds from the Duffy site.

• Incising – Incised designs are typically found on the neck/shoulder of Yankeetown vessels (Figure 1). The designs were created by cutting with a thin tool, possibly a chert flake, into semi-wet clay. Typical designs consist of a ladder-like motif consisting of "two parallel lines filled with oblique incisions" and inverted, line-filled triangles with incurvate sides (Redmond 1990:57). Other less common motifs are known as well. One variety of incised design, consisting of a single line notched by short, perpendicular incisions, has been termed "pseudo fillet," as it appears to be an imitation of the fillet motif (see Figure 2, top row, center). Incised designs are confined to jars only.

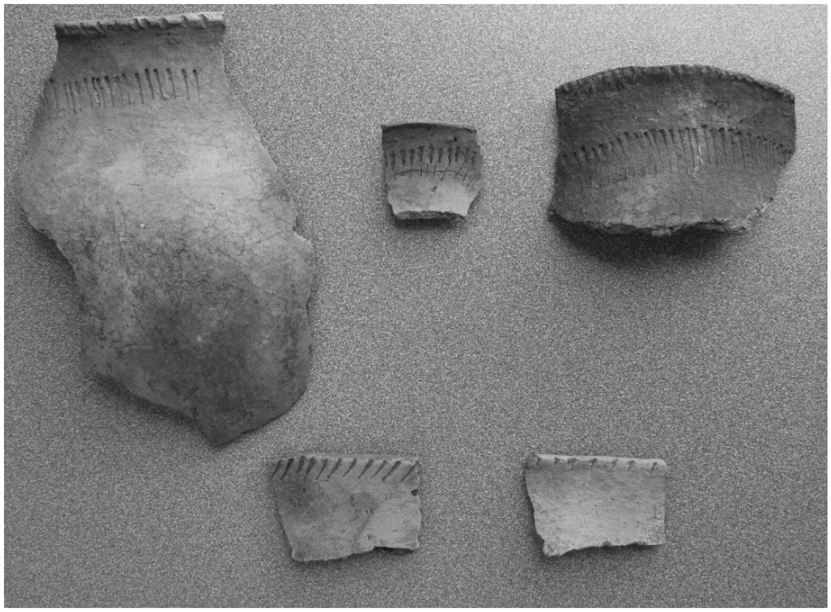

Figure 2. Examples of bar stamping (top row) and lip notching (bottom row) on Yankeetown sherds from the Duffy site. Note pseudo-fillet design on top row, center sherd.

• Bar stamping – Yankeetown vessels, both jars and bowls, were often decorated with bar stamping. The design was typically applied by impressing a series of vertically oriented punctations, creating a horizontal band (Figure 2). The tool used was often straight, creating linear bar shaped punctations, though crescent and irregularly shaped tools were used as well. Bar stamping is most often noted around the exterior rims and necks of vessels, though it was also applied to the interior rims of some bowls.

• Lip notching – Similar to fillet in some respects, lip notching consists of a series of notch or tick marks along the exterior lip of the vessel (Figure 2). It differs from fillet though, as there is an absence of a built up clay strip. In practice, it is clear that the two decorative techniques graded into one another, and many sherds are difficult to place in one category or the other.

• Nodes / Lugs – Less common are variously shaped small nodes and lugs (Figure 3 top row; Figure 1, bottom row center). Some examples consist of vertically oriented ear-like appendages placed below the rim edge, while others are small, cone-like lugs placed in rows around decorated areas of the vessel.

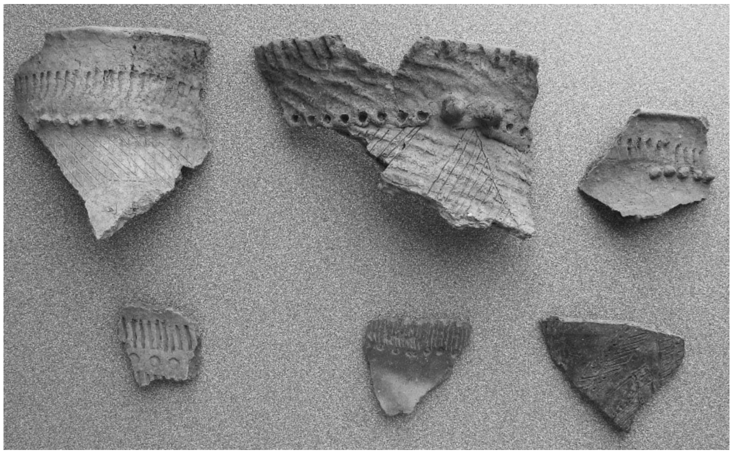

Figure 3. Examples of nodes (top row) and punctates (bottom row) on Yankeetown sherds from the Duffy site. Note check stamping on rim, top row, center sherd.

• Punctate – A final notable decorative technique is the use of punctates, most often applied in rows around the edges of incised and/or bar stamped areas (Figure 3). The tools used in this technique vary widely; some are triangular in shape, whereas others are hollow and circular, possibly representing reed impressions. One sherd recovered from the Duffy site (11Ga9) was impressed with the circular end of a fossil crinoid stem fragment (Figure 3, bottom row, left).

Though attempts have been made to designate assigned type/variety names to Yankeetown ceramics (e.g., Blasingham 1953; Dorwin 1968), these efforts have been largely unsuccessful in creating a typology that adequately captures the variety and combinations of decorative techniques present in the assemblages. Simply stated, the wide variety of decorative techniques, the use of multiple decorative techniques on a single vessel, and the presence of multiple surface treatments on a single vessel makes pigeonholing the ceramics into types very difficult (Sussenbach 1992:105). Though certain combinations of decorative motifs seem to occur with regularity (Redmond 1990:139), descriptive studies, such as that used by Redmond (1990) seem to be the most fruitful way of capturing the essence of Yankeetown pottery.

Despite Yankeetown's over 400-year span, we know very little about how decorative motifs and vessel forms/frequencies may have changed through time. Some of this is likely attributable to the fact that most Yankeetown excavations have taken place at the type site - which may have been occupied or reoccupied over a long period of time, judging from the radiocarbon evidence. Sussenbach (1992:115) has suggested that later Yankeetown can be characterized by an increase in the percentage of bowls and pans over jars, a decrease in cordmarking, and a decrease in the presence of collar-like folded-over rims. However, these suggestions have not been tested on other assemblages, and chronological issues remain murky. In particular, Sussenbach's suggestion that the percentage of bowls increases through time does not seem to hold up to closer scrutiny, as discussed above.

Other items of material culture include ceramic beads, female figurines, and pottery trowels. Ceramic discs, possibly gaming pieces, were manufactured from grog tempered body sherds, and are relatively common. The vast majority are unperforated, though drilled examples are known from a single site (Sussenbach 1992:112). Diagnostic lithics consist of serrated and unserrated triangular arrow points, humpbacked knives, and Mill Creek hoe flakes. Cherts used for toolmaking seem to be mostly local, with pebble cherts used in most cases (Redmond 1990:10). Most of the identified extra-local chert sources lie to the east and northeast of the Yankeetown core area (Cantin 2008; Garniewicz et al. 2009). Other items associated with the Yankeetown culture include stone discoidals, celts, abraders, cannel coal discs and pendants, and a variety of bone tools (Applegate 2008:398; Dorwin 1968; Redmond 1990:10-11; Sussenbach 1992).

THE ORIGINS OF YANKEETOWN . . .

Nearly 30 years ago, when Brian Redmond (1990) drew up his synthesis of Yankeetown culture, there were relatively few radiocarbon dates available, and all had standard deviations of one hundred-plus years. This made it quite difficult to place Yankeetown within a fine-grained regional chronology. Based on these few dates, Redmond suggested that Yankeetown culture spanned the period AD 700 to 1100. Today, however, the number of dates has nearly tripled (Figure 4; Table 2) and, with the advent of more precise AMS radiocarbon dating, we are much better equipped to address these chronological questions and, perhaps more importantly, review Yankeetown's relationships with those cultures that came before and after it.

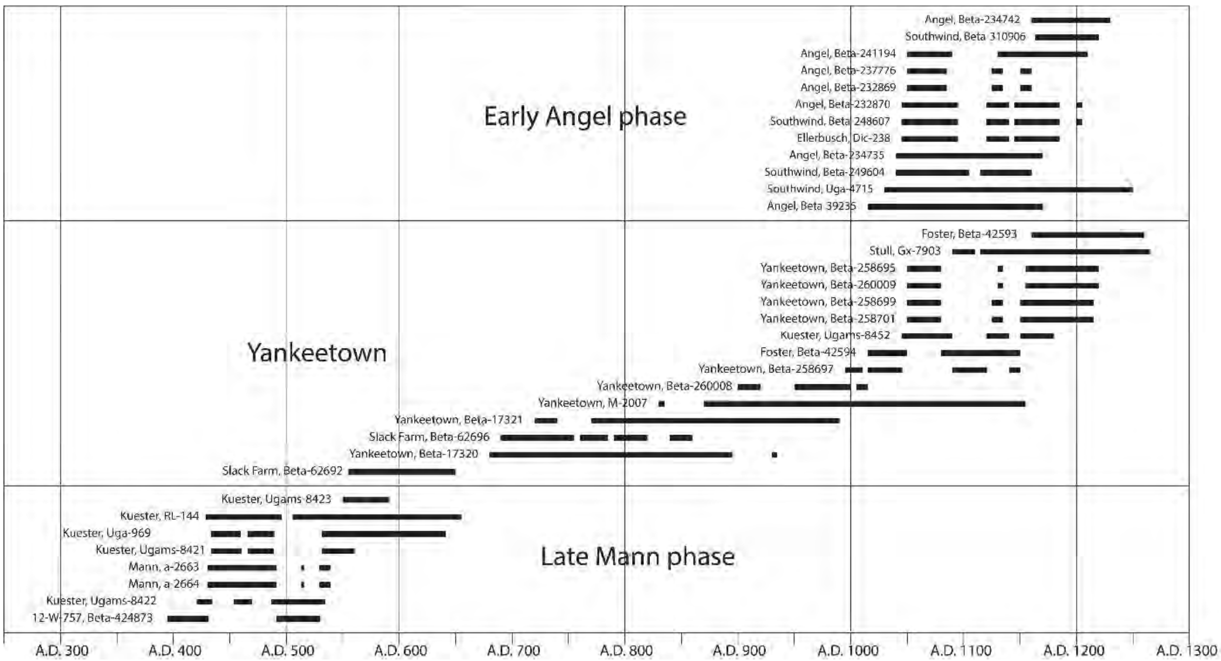

Figure 4. Calibrated Yankeetown radiocarbon dates, compared to selected late Mann phase and early Angel phase dates. All are calibrated at 1-sigma (Reimer et al. 2009).

Table 2. Radiocarbon Dates from Yankeetown Contexts.

Site	Site Number	Uncalibrated Date (rcybp)	Lab Number	Provenience and Material Dated (if known)	Reference
Yankeetown	12W1	1050±130	M-2007	Feature 11	Dorwin 1968:33
Yankeetown	12W1	1220±110	Beta-17320	Wood charcoal, small pit fea	Redmond 1990:11-12, 192
Yankeetown	12W1	1160±120	Beta-17321	Wood charcoal, small pit fea	Redmond 1990:11-12, 192
Yankeetown	12W1	870±40	Beta-258695	Riverbank Fea 23	Greenan, pers comm 2013
Yankeetown	12W1	990±40	Beta-258697	Riverbank Fea 8	Garniewicz et al. 2009:113
Yankeetown	12W1	880±40	Beta-258699	Corn kernel from Fea 20, Unit D	Garniewicz et al. 2009:50
Yankeetown	12W1	880±40	Beta-258701	Yankeetown midden, Unit O	Garniewicz et al. 2009:113
Yankeetown	12W1	1080±40	Beta-260008	Fea 21, Unit D	Garniewicz et al. 2009:52
Yankeetown	12W1	870±40	Beta-260009	Fea 22, Unit D	Garniewicz et al. 2009:53
Foster	15Da68/69	980±50	Beta-42594	Hickory nutshell from bell-shaped pit	Sussenbach 1992:105
Foster	15Da68/69	840±50	Beta-42593	Hickory nutshell from bell-shaped pit	Sussenbach 1992:105
Kuester	12Vg71	900±25	UGAMS-8452	Nutshell from Fea 72-4 (wall trench)	Strezewski 2014:Table 7.1
Slack Farm	15Un28	1460±60	Beta-62692	Yankeetown feature	Pollack and Henderson 2000:615
Slack Farm	15Un28	1240±50	Beta-62696	Yankeetown feature	Pollack and Henderson 2000:615
Stull	15Un95	860±130	GX-7903	Pit feature	Ottesen 1981:145

Questions regarding the origins of Yankeetown have not occupied the minds of most archaeologists. Rather, research has focused on the opposite end of the Yankeetown culture, regarding the relationship between the Yankeetown and Angel phases. Most of the early Yankeetown dates place its origin around AD 700 or slightly later. There is one date from a Yankeetown feature at Slack Farm (15Un28) that is considerably earlier (ca. AD 600), but we should likely withhold judgment on pushing Yankeetown this far back in time until additional data are obtained.

One of the main issues in addressing the "birth" of Yankeetown is its relationship to the Mann phase (ca. AD 200-600), the late Middle Woodland manifestation in southwestern Indiana. Both cultures occupied roughly the same geographical space, with Mann phase sites apparently occupying a slightly more restricted area (Figure 5). At the present time, there appears to be a chronological gap between the latest Mann phase dates and the earliest Yankeetown dates. Dates from Kuester (12Vg71) in particular, suggest that sites with a recognizable relationship to the Mann phase may extend as late as AD 600, which leaves an apparent 100- to 150-year hiatus between the two cultures. Though Redmond recognized this gap in 1990 (Redmond 1990:263), its width has shrunk considerably in the past 25 years. Nonetheless, it does seem to be real. Was the area abandoned during this short hiatus? We simply have no data at this point, and no early Late Woodland culture has yet been identified in the area that might fill this gap. It is possible that some Mann phase ceramic attributes may have survived into the gap and have therefore not yet been recognized as Late Woodland in surface collected material, etc. (Redmond 1990:263). What is certain is that the very late Mann phase ceramics and lithics at sites like Kuester (dating to ca. AD 450–600) are virtually identical to materials from the Mann site proper. Ruby's (1997:193-197), study of Mann site ceramics found only minor variation through time and no apparent trending toward an increasingly Yankeetown-like or Late Woodland-like profile.

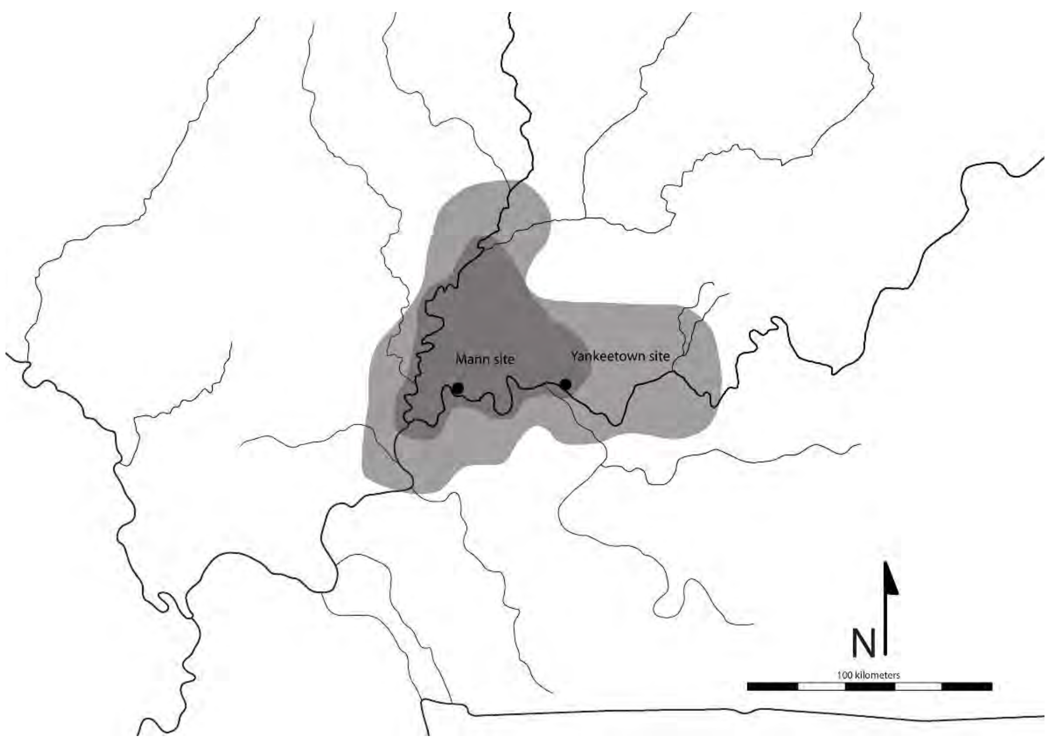

Figure 5. Distribution of Yankeetown (light gray) and Mann phase (dark gray) sites (based on Redmond 1990:256 and Ruby 1997:302).

Overall, there are few commonalities between Mann phase and Yankeetown material culture that would serve to establish an unambiguous ancestor-descendant relationship between the two (Ruby 1997). The two traditions both tempered their ceramics with grog, made bowls and jars, and manufactured small figurines. The latter were fairly unusual, especially in Late Woodland contexts. The differences between the two though, are otherwise profound. Bret Ruby (1997:84), in fact, has characterized the Mann/Yankeetown transition as one of "rapid and sweeping cultural change."

Examination of a large collection of Yankeetown materials from the Duffy site in Illinois (11Ga9) suggests a possible Middle Woodland/early Yankeetown link[1], not previously recognized. Of the 77 large rim sherds from Duffy, five exhibit check stamping underlying classic Yankeetown decorative motifs (e.g., bar stamping, nodes, and/or incising). This surface treatment has not yet been reported for Yankeetown pottery, which is otherwise overwhelmingly plain. Check stamping is known, however, from the La Motte culture, in the form of grit tempered Embarrass Check Stamped pottery. La Motte sites, which date to the late Middle and early Late Woodland periods (ca. AD 150–800) are found farther up the Wabash River drainage, between Vincennes and Terre Haute (Redmond and McCullough 2000; Winters 1967:53). Though La Motte ceramics indicate that check stamping has a Middle and early Late Woodland pedigree in the region, it is very rare in Mann phase Middle Woodland assemblages of southwestern Indiana, a fact that argues against an unambiguous Mann-to-Yankeetown transition. Furthermore, three of the five check stamped rims from Duffy have turned over rim collars, an otherwise rare attribute in the Yankeetown assemblage. Though the evidence is not unequivocal, both attributes may be indicative of early Yankeetown ceramics.

It must be pointed out, however, that check stamping is also known from shell tempered Mississippian period ceramics in south-central and east-central Kentucky (Hanson 1970:42; Lewis 1996:140). Though these sites are somewhat distant from the Yankeetown homeland, we must consider the possibility that the check stamping at Duffy may not be as chronologically diagnostic as we might wish. Though Sussenbach (1992:115) has suggested that the Duffy site materials may be late Yankeetown, at this point it seems too early to tell. Unfortunately, there have been no responsible excavations at Duffy, and no radiocarbon dates are yet available.

. . . AND ITS DEMISE

At the opposite end of the Yankeetown chronology, the main question to be addressed is: What is the relationship, if any, between Yankeetown and Angel phase Mississippian? Also, did Yankeetown peoples, in whole or in part, directly contribute to the Angel phenomenon, and was there any temporal overlap between the two? At one time, the Yankeetown-to-Angel question was largely considered an either/or proposition–either Yankeetown peoples became Mississippian, or they were displaced by them. In more recent years, however, the answers to questions like these have become more nuanced. As we increasingly appreciate the historical particularities of each region, we have become aware of the complexities that underlie the Mississippianization process, that is, the creation of what we recognize as "Mississippian culture" from its "non-Mississippian" constituents (Pauketat 2003). It is clear that though the ultimate endpoint of this process was region wide sharing of cultural attributes, different unique events certainly transpired in each area.

Over the years, those interested in Yankeetown and/or Angel have expressed varied opinions as to the relationship between the two. Redmond (1990), in the first major summary of the Yankeetown data, made an argument for Yankeetown-to-Angel continuity based on an overall similarity in a number of cultural attributes, including the shared presence of multiple, similar vessel forms, a riverine ecological adaptation, similarity in settlement location and type, and a subsistence system based on maize cultivation. The distribution of Angel phase sites overlaps considerably with Yankeetown as well (Figure 6). In fact, Redmond noted that more than 80% of Yankeetown sites also contained an Angel phase component, which was interpreted as further evidence for continuity. In both cultures, substantial sites do not occur east of the mouth of the Anderson River, though this fact likely has more to do with a shared ecological adaptation and an absence of large floodplains above this point than anything else (Green and Munson 1978:304), though the two cultures do share a degree of correspondence in many respects, Redmond admitted that more direct evidence in the form of transitional artifacts was not yet forthcoming.

[1] The Duffy site materials were collected by avocational archaeologist Robert Henn and are curated at the University of Southern Indiana (Accession #304).

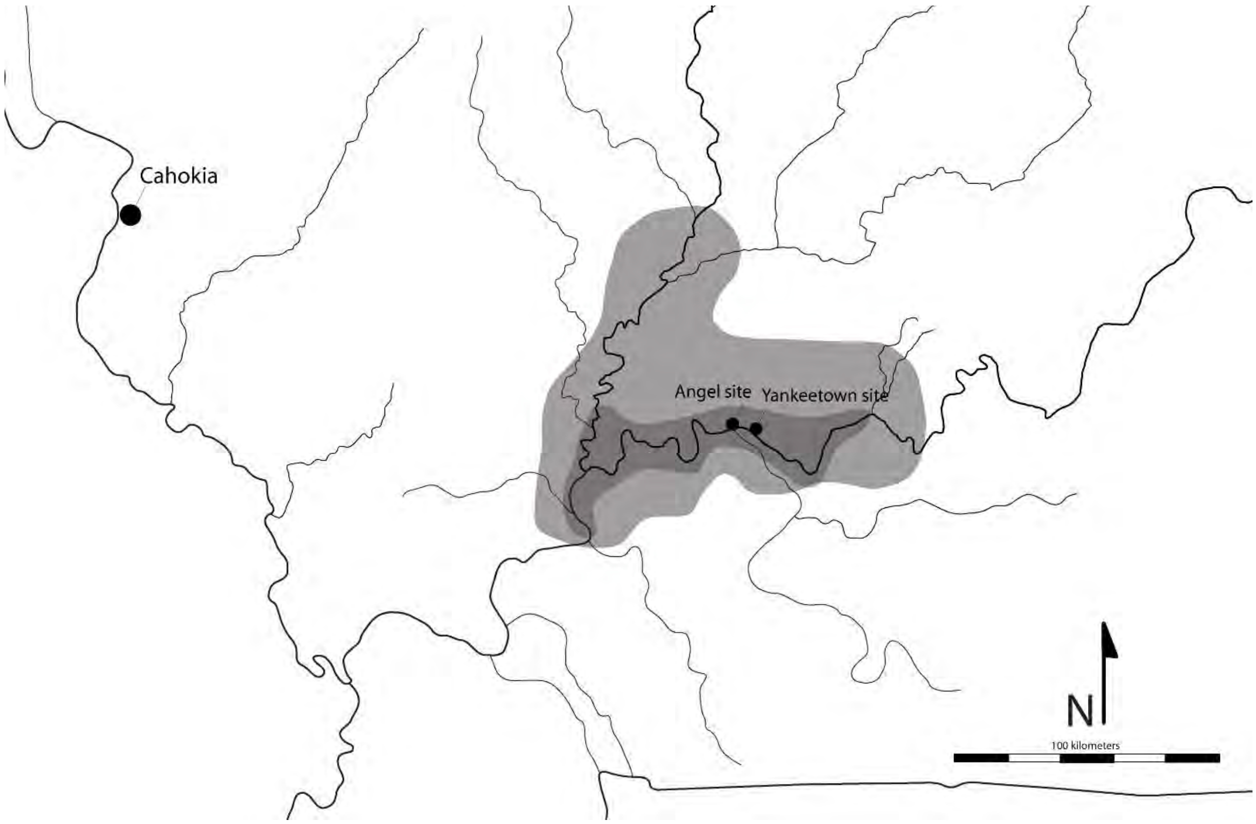

Figure 6. Distribution of Yankeetown (light gray) and Angel phase (dark gray) sites (based on Redmond 1990:256 and Peterson 2010:28).

In contrast, Hilgeman (2000:236) saw this lack of direct evidence for a transition as an indication of abrupt replacement, noting that it seemed "premature to posit a cultural ancestor-descendant relationship between Yankeetown and Angel." She also noted that the high percentage of sites with both Yankeetown and Mississippian components was not adequate evidence for transition. It was felt, rather, that the reoccupation of sites simply indicated that people, whether Archaic, Woodland, or otherwise, were simply looking for attractive places on the landscape, and these spots therefore tended to be used over and over again.

The most recent research at the Angel site proper seems to support Hilgeman's basic position. In recent years, personnel from Indiana University have performed extensive geophysical survey across the site, coupled with targeted excavations and coring (Monaghan and Peebles 2010; Peterson 2010). Consequently, we have a greatly enriched body of recently collected data and radiocarbon dates with which to make statements about the origins of Angel. Particularly useful in this regard has been Monaghan and Peebles' (2010) coring of Mound A and Monaghan et al.'s (2013) dates from Mound F. Dates from both contexts indicate that mound construction commenced at Angel as early as AD 1050. Furthermore, the similarity of dates from various depths in Mound A suggests that 1) large portions of the mound were apparently constructed in a short period of time, 2) the initial site population was large enough to undertake such a project, and 3) those constructing the Angel site had a definite site plan in mind when they arrived (Monaghan and Peebles 2010:948).

At this point, the data point to a situation in which the Angel phenomenon came about, at least in part, by the immigration of an unknown but not inconsequential number of culturally Mississippian peoples rather than by a wholesale, in situ transformation of Yankeetown (Monaghan and Peebles 2010:950). Outside of the Angel site proper, radiocarbon dates from the Southwind and Ellerbusch sites suggest that early Angel phase settlement may not have been confined to the Angel site alone (Hilgeman and Schurr 1987; Striker et al. 2009).

Returning to the question of the Yankeetown/Angel relationship, probably the most helpful data we have in answering this question is the numerous new radiocarbon dates for Yankeetown occupations. These dates have consistently indicated that the Yankeetown culture may have persisted into the AD 1200 range, 100 years later than proposed by Redmond (1990). A number of relevant observations can be made. First, these very late dates were obtained from a number of Yankeetown sites (i.e., the Yankeetown type site, Foster, and Stull), indicating a continued late presence of Yankeetown peoples over a wide area. At this point, we cannot detect a contraction of Yankeetown territory during its last days. Second, most of the Yankeetown dates occupy the final portion of the sequence. If the number of dates for a given time period is any indication of the intensity of region-wide presence, it would seem that Yankeetown occupations became more numerous toward the end of the sequence. One certainly does not get the impression that Yankeetown went out with a whimper. Finally, there is an almost complete overlap between the late Yankeetown radiocarbon dates and the earliest Angel phase dates. At this point we cannot see any temporal gap between the two, given the resolution available through radiocarbon dating. This leaves no time for Yankeetown to "transform" into Angel phase Mississippian solely through outside influence/emulation.

How then, do we resolve this chronological quandary? The temporal overlap between the two would seem to suggest a possible period of cohabitation by both Angel and Yankeetown peoples in southwestern Indiana. Following this scenario, Mississippian-related peoples may have moved into the Yankeetown core area, ca. AD 1050 and, while establishing a recognizably Mississippian town as their "capital," incorporated Yankeetown peoples into their early villages. Possibly, after a period of time, these Yankeetown individuals were assimilated into a Mississippian way of life, rapidly relinquishing their distinctive Yankeetown material culture. If so, we would expect to find evidence for Yankeetown/Mississippian cohabitation and possibly evidence of transitional artifacts, especially pottery.

Up to this point, this scenario has not been supported by the excavated data. Yankeetown and Angel ceramics and/or features have been identified at many sites in the region, possibly indicating the coincident presence of both cultures within a single settlement. However, these investigations have been unable to resolve whether the Angel and Yankeetown materials represent coeval or successive occupations (Alt 2010; Alt et al. 2011; Hilgeman and Schurr 1987:87; Strezewski 2014; Sussenbach 1992:103). At the Kuester site, for example, a wall-trench structure was excavated along with a handful of features containing Yankeetown and/or Angel phase ceramics (Apfelstadt 1973). Light densities of Yankeetown and Angel pottery were found over most of the area excavated, initially suggesting the possibility of a farmstead-like cohabitation by both Yankeetown and Angel individuals. Recent radiocarbon dates, however, have not supported this hypothesis. Rather, it appears that the site may represent an initial Yankeetown presence ca. AD 1100 (UGAMS-8452, 840±25 rcybp) followed by an Angel occupation in the fourteenth century (UGAMS-11576, 630±20 rcybp) (Strezewski 2014:92). It is certainly possible that some of the shell tempered ceramics at Kuester are associated with the earlier Yankeetown occupation but, as the two components are not stratigraphically discrete, there is no way to confidently argue the case.

Perhaps the most convincing evidence for the assimilation of Yankeetown people into a Mississippian-like way of life would be the presence of transitional artifacts, ceramics in particular. Overall, there is very little evidence for this within the Yankeetown core area (i.e., near the Angel and Yankeetown sites) (Hilgeman 2000:236). Blasingham (1965:20) identified a single grog tempered sherd with a loop handle from the Yankeetown site, suggesting a possible Mississippian-like transitional vessel. Furthermore, Redmond (1990:55) noted the presence of a small number of plain grog and shell tempered sherds from the Yankeetown site. However, the most recent excavations at 12W1, which resulted in the recovery of more than 7,000 sherds, have produced absolutely no examples of transitional ceramics, in terms of the tempers used and/or decorative motifs. This is especially noteworthy in light of the fact that nearly all the radiocarbon dates from these excavations completely overlap with the earliest Angel phase dates (Garniewicz et al. 2009). Current data indicate that anything that could be deemed "transitional" is extremely rare at the Yankeetown site.

Similarly, there are very few Yankeetown sherds from the Angel site, at least in those areas excavated up to this point. Although quite distinct when compared to Angel ceramics, Hilgeman (2000:121) identified only 24 Yankeetown sherds from the more than 20,000 she examined. In fact, Yankeetown ceramics are less frequent than many extra-local types identified at the Angel site. If Yankeetown villagers were cohabitating or even interacting with Angel Mississippian people, they left behind very little evidence of this activity.

Though transitional-looking pottery is rare to absent within the Yankeetown core area, more convincing evidence has been identified along the periphery. One instance is the Foster site (15Da68/69), which produced a number of shell tempered sherds with Yankeetown decorative motifs such as notched fillet, incising, and bar stamping.

Though grog tempered sherds dominated the assemblage at this site, shell tempered materials were also identified in all six features excavated (Sussenbach 1992:115). In addition, sherds tempered with both shell and grog have been found in southern Illinois (Butler et al. 1979) and the Stull site in Kentucky (15Un95) (Ottesen 1981). Notably, radiocarbon dates from Stull and Foster place them in the twelfth or early thirteenth centuries, within the acceptable timeframe in which a transition may have taken place. Finally, possible Yankeetown/Angel transitional sherds were also identified at the Andalex site (15Hk22) a Mississippian town site in Hopkins County, Kentucky, about 80 km south of the Evansville area. Though small in number, these consisted of cordmarked sherds tempered with both shell and grog, and shell tempered sherds with a Yankeetown pseudo-fillet design (Kreisa et al. 1991:80-81).

It should be pointed out that although the "smoking gun" of transitional ceramics has long been sought after as a means to document the timing and nature of Yankeetown/Angel contact, there is no preordained reason why culture contact must result in a mixing of ceramic traditions. Yes, material culture does figure into assertions of cultural identity in situations of culture contact (Stein 2002:905); however, whether or not the blending of ceramic traditions occurs undoubtedly has much to do with such things as the nature of the contact situation (e.g., antagonistic versus mutually agreed upon), the power relations between the two cultures, and the cultural meaning associated with a particular manner of making pottery. In some situations, participants may not have felt it essential to maintain one's ceramic traditions in the face of cultural contact and quickly dropped their old ways. Such rapid transitions may be nearly invisible archaeologically. Alternatively, peoples of two cohabitating cultures may have found it acceptable, even desirable, to maintain their separate ceramic traditions over multiple generations. For an example, one need look no farther than central Indiana. During the Late Precontact Oliver tradition (AD 1100–1450), peoples from both Fort Ancient and western Lake Erie ceramic traditions came together and maintained two separate pottery styles for many hundreds of years, with blending of the two occurring only at the very end of the Oliver sequence (Redmond and McCullough 1996, 2000:663-664).

Overall, the data indicate a probable temporal and spatial overlap between late Yankeetown and early Angel. However, despite the fact that the Yankeetown and Angel sites are only about 14 km apart, there is virtually no evidence for Mississippian cohabitation and/or interaction at the Yankeetown site and vice versa. Nor is there yet any compelling evidence for cohabitation of Yankeetown and Angel peoples at outlying sites. It is possible that the two cultures chose to "share" this stretch of the Ohio River valley for a time, possibly for mutually beneficial reasons, but the lack of evidence for interaction between the two seems suspicious. This conundrum begs for a satisfactory explanation that as of yet is not fully developed.

THE REGION-WIDE PICTURE

Though most data are provisional and/or equivocal, what seems to be certain is that the Terminal Late Woodland-to-Mississippian transition played out differently when we look at the situation on a case-by-case basis and at a region-wide level. Close examination of the historical particularities will undoubtedly provide a much more satisfactory understanding of this process than can be accomplished by overarching explanatory schemes. The fact, however, that this shift seems to have developed over a very broad area at roughly the same time (Pollack 2008:607) argues that we must also look beyond sub-regional particularities in order to explain why the Mississippian phenomenon occurred. Certainly, it would appear that the Terminal Late Woodland Ohio River valley was ripe for Mississippianization to take place. This is not to imply that it was voluntary or willingly accepted; many groups may have actively resisted new ideas, cultural practices, and people, while others willingly accepted new ways of "thinking and doing." In most cases, it was likely a complicated combination of both. Nonetheless, Mississippianization did happen. I will not speculate here as to the reasons for this widespread cultural transformation but rather briefly summarize how the events seem to have played out in areas adjacent to southwestern Indiana.

Overall, in most areas, there is fair to good evidence for events that can be characterized as an in-situ transition from a local Late Woodland antecedent. Whether this transition also involved immigration of Mississippian peoples, their ideas and/or material culture, it is often hard to say. Nevertheless, it would appear that the Mississippianization of many areas involved a cultural transformation of local peoples rather than their wholesale replacement. In the Wabash River drainage north of the Yankeetown homeland, for example, there seems to be a fairly clear transition from Albee to Vincennes phase Mississippian after AD 1050, possibly in response to contact with Cahokian styles and ideology. Some evidence also suggests immigration of a small number of Mississippian peoples to the region (Wells 2008:361). Notably, it seems that while Albee in the lower Wabash and Embarras drainages transitioned to a more recognizably Mississippian culture (albeit with a local, multicultural flavor), those in central Indiana continued to maintain Late Woodland adaptations and material culture (Wells 2008:85, 358).

Farther along the Ohio River, in the Kincaid and lower Tennessee/Cumberland river valleys, the Douglas phase (AD 850–1000) marks the transition from Terminal Late Woodland to Mississippian. Though excavated Douglas phase contexts are extremely limited, there is some indication for Mississippianization of local Terminal Late Woodland peoples in the form of grog tempered vessels manufactured according to Mississippian vessel forms (Muller 1986:161) and the admixture of grog tempered and grog/shell tempered sherds in association with the first mound stage at Kincaid's Mxº7 (Butler 1991:266). Overall, the appearance of Mississippian characteristics may be a bit earlier than that noted for southwestern Indiana.

Similarly, there appears to be fair evidence for Mississippianization of local residents in extreme western Kentucky (Lewis 1991:276-281; Wesler 2011:46). At the Marshall site (15Ce27), for example, superimposed structures built with wall trenches and individually set posts were identified, as well as hybrid forms of grog and shell tempered ceramics (Sussenbach and Lewis 1987). Radiocarbon dates place the Marshall site occupation sometime after AD 900. Similar materials have been identified at other sites in the Mississippi/Ohio confluence region (Lewis 1991:281).

In sum, it would appear that a case can be made for some form of in situ transition of Terminal Late Woodland populations in many areas adjacent to southwestern Indiana. In this light, the Yankeetown/Angel relationship is even more curious, as Yankeetown clearly seems to persist, seemingly unchanged, well past the initial occupation of the Angel site. There is likely an interesting cultural dynamic that played out in this stretch of the Ohio River valley.

One piece of the puzzle that is being explored is the possibility that some Yankeetown individuals may have migrated from southwestern Indiana to the American Bottom region after AD 1050 and became active participants in the Cahokian phenomenon (Alt 2006). The existence of Yankeetown ceramics in the American Bottom region has been noted for some time (Green and Munson 1978:306; Redmond 1990:178), though until recently, there has been little attempt to better understand their significance. Yankeetown materials have been identified at Cahokia proper and at a number of upland Richland Complex sites east of Cahokia, with most contexts pointing to a Lohmann through early Stirling phase occupation (i.e., ca. AD 1050 and 1150) (Alt 2002, 2006; Alt et al. 2011:13).

Alt (2002) and Pauketat (2003) see the Yankeetown presence as part of an influx of immigrants following the AD 1050 Cahokian "Big Bang." Evidence of seemingly rapid population growth, coupled with non-local ceramic and house types, strongly suggests immigration of extra-local groups into the region, creating cultural heterogeneity, such that after AD 1050 most "Cahokians" likely originated from outside the immediate area (Pauketat 2003:53). It is interesting to note that the movement of Yankeetown peoples into the Cahokian sphere occurred at or about the same time that Angel was founded. Whether this population movement occurred as a result of a Mississippian intrusion into southwestern Indiana, it is hard to say. It is notable, however, that the radiocarbon dates suggest a persistence of Yankeetown in Indiana after this migration took place. It would seem that not all Yankeetown peoples felt the Cahokian "pull" or the Angel "push," to whatever extent these may have occurred.

CONCLUSIONS

Undoubtedly, the answers to these questions are more complicated that we previously thought, both in terms of Yankeetown's genesis around AD 700 and its ultimate disappearance from the archaeological record ca. AD 1200. Yankeetown culture has been chronically understudied during the past 80 years, and there is still a great deal we do not know. A general problem is a lack of well-excavated baseline data. As a point of departure, basic questions for future Yankeetown research include:

1) When does more intensive maize adoption occur and to what degree? At the present time, we have sufficient evidence that Yankeetown peoples grew maize, presumably in fair quantities. Still, we know virtually nothing about when intensification occurred, the rapidity of this event, the eventual degree of dependency, and the timing when compared to adjacent groups.

2) Are there any differences in material culture between early and late Yankeetown? The Yankeetown phase, as currently understood may span more than 400 years, and it is highly likely that diagnostic artifacts, particularly ceramics, varied throughout that time. Apart from a few provisional suggestions, however, we know virtually nothing about this process. Data are especially sparse on early Yankeetown.

3) With the possible exception of the Mann site itself, there is very little evidence of larger settlements during the late Middle Woodland Mann phase (Ruby 2006:201); however, a number of Yankeetown phase sites have been identified

as probable larger-scale habitations, with at least five that are more than 1.0 hectare in size (Redmond 1990:181-186). We currently have no information on when these settlements first came about, their spatial layout, the degree of sedentism, and the intensity of the occupations.

4) What role does the Yankeetown type site play in the overall picture? Though one of the largest known Yankeetown sites, very little is yet known about the internal organization of 12W1, its extent, or the types of structures associated with the Yankeetown occupation (Garniewicz et al. 2009:2).

Though there are many other avenues for future research, one point to emphasize is that we should pay more attention to Yankeetown in its own right, rather than as the immediate predecessor of something "bigger," like Angel phase. It is clear that a number of important radical changes occurred during the Terminal Late Woodland period, and the Yankeetown people as innovators deserve all the credit due to them.

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EXPLORING MONROE COUNTY'S PAST: AN ARCHAEOLOGICAL SURVEY OF INDIANA UNIVERSITY AND SYCAMORE LAND TRUST NATURE PRESERVES

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[NOTE- At the time this article was written, the author was with the Glenn A. Black Laboratory of Archaeology, Indiana University, now part of the Indiana University Museum of Archaeology and Anthropology.]

ABSTRACT

The Glenn A. Black Laboratory of Archaeology (GBL) at Indiana University conducted an archaeological survey in Monroe County, Indiana for a FY2017 Historic Preservation Fund Grant (18-17-17FFY#-03). This project was funded in part by a grant from the U.S. Department of the Interior, National Park Service's Historic Preservation Fund (CFDA #15.904) administered by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology. This grant project explored the history and cultural resources of the Beanblossom Creek watershed in northern Monroe County. Approximately 511.5 acres (207 hectares) of nature preserves were surveyed as part of the project, resulting in the identification of 56 new archaeological sites and one new cemetery. A total of 833 artifacts (547 precontact and 286 historic) were recovered from nine different nature preserves. Cultural periods represented in the survey assemblage include unidentified precontact, Middle Woodland, and nineteenth-twentieth century historic components.

INTRODUCTION

The Glenn A. Black Laboratory of Archaeology at Indiana University (IU) was awarded a FY2017 Historic Preservation Fund Grant to survey nature preserves in northern Monroe County, Indiana. The project involved both shovel test and pedestrian survey of nearly 512 acres across different landforms and topography at nine nature preserves spanning the Beanblossom Creek watershed. The primary goal of the project was to enhance our understanding of the deeper history of settlement and occupation in Bloomington and wider Monroe County by identifying and documenting new archaeological sites in the Beanblossom Creek watershed.

More specific project goals included refining the local cultural chronology, improving our understanding of settlement patterns and mobility during the Early and Middle Archaic periods, increasing our knowledge of the regional historic pioneer settlement, and evaluating how changes and advances in survey methodology and State-mandated methodological standards affect the identification of sites. Previously, the Beanblossom Creek watershed had 274 archaeological sites recorded in the Indiana Division of Historic Preservation and Archaeology State Historic Architecture and Archaeological Research Database (SHAARD) (2017). This project added 56 new archaeological sites and one new cemetery to SHAARD.

BACKGROUND

NATURAL SETTING

Monroe County is located in south-central Indiana and covers a total area of 263,680 acres (Figure 1) (Thomas et al. 1981:1). The Beanblossom Creek drainage is the major waterway traversing northern Monroe County from its headwaters in Brown County to its confluence with the West Fork of the White River in the northwestern corner of Monroe County near Gosport, Indiana. The Beanblossom Creek has served as an important and primary water source for local residents from antiquity through the twenty-first century. The following is a brief review of the natural and cultural settings of the Beanblossom Creek drainage basin.

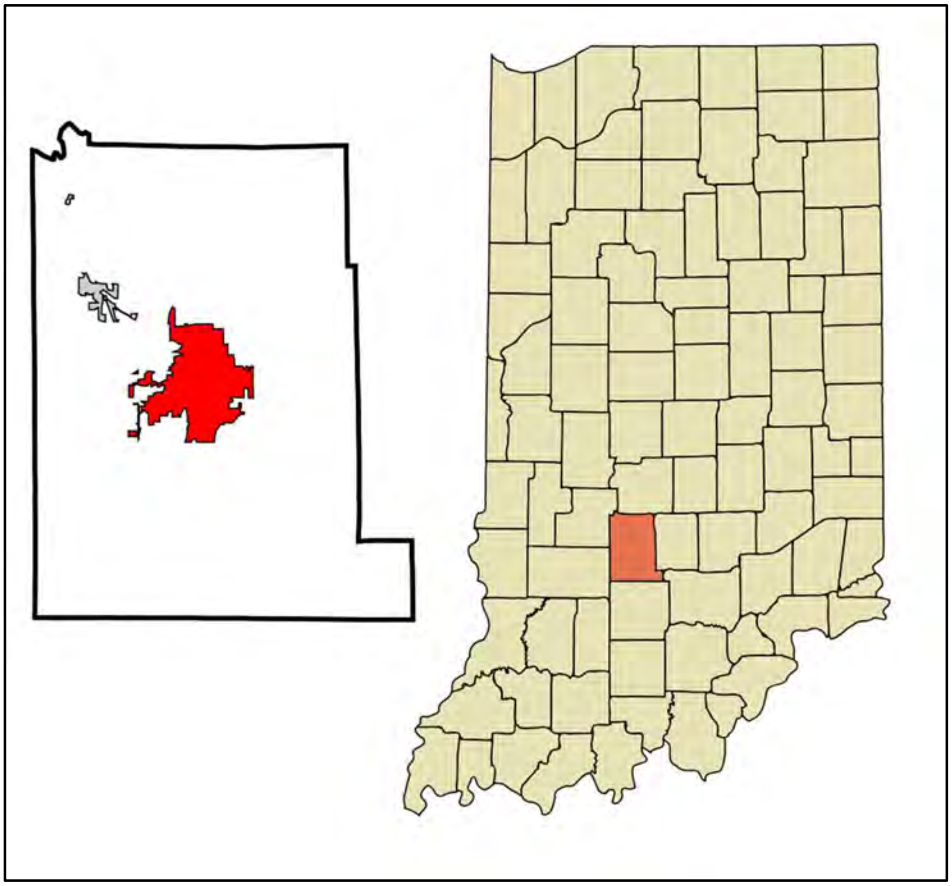

Figure 1. Location of Monroe County, Indiana. Inset displays incorporated Bloomington, Ellettsville, and Stinesville (CC-BY-SA-3.0 (http://creativecommons.org/licenses/by-sa/3.0/)).

Northern Monroe County was glaciated during the Illinoian glaciation (120,000 years); however, the local physiography was not altered to a large degree (Camp and Richardson 1999; Hartke and Gray 1989). The latest Wisconsin glaciation (20,000 years) did not extend as far south as Monroe County and the Beanblossom watershed; however, being located just south of the Wisconsin Glacial Boundary and in close proximity to glacial action did shape the physical landscape of Monroe County. During the Wisconsin period, glacial outwash inundated the Beanblossom Creek drainage, and loess soils were deposited, capping most of the county.

While Monroe County is comprised of three different physiographic zones, the Beanblossom watershed is situated primarily within the Norman Upland zone but does extend into the Mitchell Plain. The underlying bedrock geology is Mississippian in formation (250 million years); northern Monroe County consists of limestones from the middle Mississippian Sanders and Blue River groups and middle Mississippian siltstone and shales of the Borden Group, which were important economic resources for local industries historically (Thomas et al. 1981). The Norman Upland zone is a highly dissected plain characterized by steep-sided ridges and narrow valleys. The soils in this area are predominantly deep, moderately to well drained silt loams on the steep slopes of the uplands with deep, poorly drained silty clay loams present in alluvial floodplains (e.g., Berks, Gilpin, Tilsit, Weikert, and Wellston soils) (Hartke and Gray 1989:2; United States Department of Agriculture [USDA] Soil Survey 2009). The Mitchell Plain zone, adjacent-west to the Norman Uplands, is an area of lower relief, rolling plains pocked with sinkholes and narrow valleys along streams. The karst topography was formed through the erosion of the underlying limestone bedrock. The soils in this area are predominantly deep, moderately to well drained silt loams on the steep slopes of the uplands with deep, poorly drained silty clay loams present in alluvial floodplains (e.g., Bedford, Caneville, Caneyville Variant, Corydon Variant, Crider, and Hagerstown soils) (Hartke and Gray 1989:2; USDA Soil Survey 2009). Beanblossom

Creek and its tributaries are deeply entrenched valleys; this dissection is likely due to pre-Wisconsin meltwaters inundating the streambeds.

Chert resources are locally accessible via ubiquitous glacial till in streams as well as outcrops of Indian Creek, Stanford, Muldraugh, and Harrodsburg cherts available nearby in the central and southern portions of Monroe County (Justice 2006; Stafford and Cantin 2009).

Wider Monroe Country, Indiana, has a continental temperate climate with hot, humid summers and moderate to cold, damp winters. Winter high temperatures average 32° F, and summer high temperatures average 85° F, but temperatures can range from -20° F to well over 100° F (Hartke and Gray 1989). Average annual precipitation is approximately 44 inches and is evenly spread throughout the year; seasonal snowfall averages 8 inches annually.

The Beanblossom Creek watershed is primarily forested, with land cleared for agricultural and pastoral uses and expanding residential zones outside of Bloomington and Ellettsville (Schnapp 2008). Until the mid-1800s, Monroe County was primarily composed of woodland forest species, although by the end of the nineteenth century, the majority of timber-bearing forest was cleared for farmland, whose yield fell after initial depletion of nutrient-rich soils (Hartke and Gray 1989). Extensive clearing for agriculture in the lowlands and logging in the uplands altered the composition of remaining forest. Now, mixed-forest communities consist primarily of oak-hickory in the uplands and beech-maple and ash in the lowlands; the forest understory includes small trees (like dogwood, redbud, and blue beech) and shrubs (Hartke and Gray 1989; Petty and Jackson 1966; Schnapp 2008). However, the rolling hills and ravines that now characterize the landforms of northern Monroe County were components of a rich environment dominated by hardwood forests and temperate vegetation during the transition to the Holocene (Justice 2006; Petty and Jackson 1966).

The temperate climate in Monroe County provides a hospitable environment for a variety of fauna that have been used by local human residents for thousands of years. According to Rae Schnapp, common wildlife species in the Beanblossom Creek watershed include "whitetail deer, wild turkey, squirrels, fox, and coyote ... and fish and aquatic life, such as bluegill, crappie, largemouth and smallmouth bass, and catfish" (2008:19). Some animals were hunted to local extinction by Euroamerican settlers including bison, elk, river otter, bobcat, cougar, American black bear, and American wolverine, but would have been part of the rich ecosystem before European contact (Hahn 1909). Precipitation and runoff are the primary sources of water in Monroe County. Beanblossom Creek is a fifth order stream with a southwesterly flow that is a tributary to the West Fork of the White River (Figure 2). The waters of the White River drain into the Wabash, then the Ohio, then the Mississippi, and eventually into the Gulf of Mexico. Beanblossom Creek drains 334.34 square kilometers of land in Monroe County (Schnapp 2008). Due to the steep topography, the region is well-drained by the dendritic drainage system with rapid runoff and flows that experience large fluctuations throughout seasons. (Schnapp 2008; Schneider 1966:46). The underlying karst topography along the eastern portion of the Beanblossom Creek watershed formed natural springs; however, the occurrence of wetland environments (e.g., Beanblossom Bottoms Nature Preserve) are generally limited due to the severe dissection of topography.

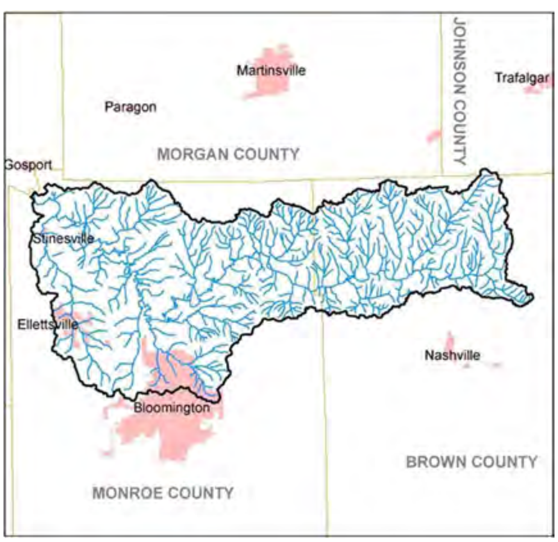

Figure 2. Map of the Beanblossom Creek watershed (Mapped by Tom Reeve, Office of Water Quality 2012).

CULTURAL SETTING

Due to the proximity to water, subsistence, and lithic resources, the entire Beanblossom Creek watershed has been an attractive location for habitation and has a high probability for archaeological sites spanning pre and post-contact periods. Indeed, archaeological evidence demonstrates that the Beanblossom Creek watershed has been inhabited from the Paleoindian Period (+12,000–8000 BC) through the present; however, the archaeology of Monroe County and wider south-central Indiana is poorly understood in comparison to other areas of the state. There have been transportation, cultural resource management, and research projects that have identified archaeological and cultural resources in the Beanblossom Creek area; prior to this project, there were 274 archaeological sites recorded in the entire Beanblossom Creek watershed (SHAARD) (Table 1). The vast majority of archaeological sites were not afforded a definitive cultural affiliation and are reported as unidentified precontact. The majority of sites assigned a cultural affiliation were multi-component (Table 1).

Table 1. Frequency of Sites with Cultural Affiliations in Beanblossom Creek Watershed, Monroe County, Indiana (SHAARD).

Period/Phase	Frequency of Sites by Component
Unidentified Precontact	205
Paleoindian	3
Early Archaic	28
Middle Archaic	12
Late Archaic	38
Late Archaic/Early Woodland	2
Early Woodland	3
Middle Woodland	4
Late Woodland	6
Late Woodland/Mississippian	2
Mississippian	2
Historic	28

Although the purpose of our survey was to identify new sites in unsurveyed areas, we were particularly interested in undocumented Early and Middle Archaic and underreported historic pioneer settlements in northern Monroe County. Here, we provide a brief background on the culture history of broader south-central Indiana, including precontact periods (Paleoindian, Archaic, Early Woodland, Middle Woodland, Late Woodland, Mississippian/Late Precontact) and post-contact historic periods (beginning with European exploration to present).

Paleoindian Period

While it is now known that the peopling of the New World likely predates 12,000 BC, Paleoindian Period sites are the earliest encountered to date in Indiana (Kellar 1973). Paleoindian populations were highly mobile hunter and gatherers (Tankersley 1990, 2004; Tankersley and Morrow 1994). Paleoindian archaeological sites are generally identified by the presence of distinctive fluted spear points, the earliest of which is the Clovis point. In addition to lanceolate spear points, tool kits also included: knives, scrapers, blades, awls, and hammers.

In Indiana, the Paleoindian Period (12,000–8000 BC) is limited to more ephemeral sites like isolated finds or small lithic scatters that lack supporting habitation and subsistence data. There have been three Paleoindian sites identified in the Beanblossom Creek watershed that are comprised of an isolated find and two small lithic scatters (SHAARD); however, 12Mo374 which was documented during the 1978 GBL survey of the Beanblossom Creek, may be a fourth Paleoindian site misidentified as dating to the Middle/Late Archaic.

Archaic Period

The Archaic Period (8000–1000 BC) is generally subdivided into three subperiods: Early (8000–6000 BC), Middle (6000–4000 BC), and Late (4000–1000 BC). Across the midcontinent, the late Wisconsin-early Holocene transition and middle-Holocene are poorly understood (Emerson and McElrath 2009). The Archaic Period is marked by an increase in population and shifting settlement patterns: Early Archaic groups are characterized as mobile and opportunistic hunter-gatherers becoming more sedentary near large waterways during the Middle and Late Archaic (Stafford and Cantin 2009). The purported increased sedentism of the Late Archaic coincided with introduction of new tool types and long-distance trade (Emerson and McElrath 2009). Along with semi-permanent villages, the construction of shell and burial mounds, mortuary rituals, and far-flung trade for copper from the Great Lakes and marine shell from the Gulf Coast point to increasing ceremonialism and complexity during the Late Archaic (Kellar 1973).

The Archaic Period in southern Indiana has been documented through survey and excavation and was divided into sub-phases based on radiocarbon assays. In Monroe County, there are numerous extraction, lithic scatter, camp, and habitation sites (SHAARD). Just over 20% of sites in the Beanblossom Creek watershed in Monroe County have at least one Archaic component; over half of these sites have either an Early and/or Late Archaic component (Table 1). Early and Late Archaic sites are typically isolated finds or small lithic scatters that represent temporary camps; however, reconnaissance at the Hidden Hill (12Mo677) and Pumpkin (12Mo676) sites and excavations at the Scherschel (12Mo152) and Oliver Vineyard (12Mo141) sites demonstrated that significant Middle and Late Archaic habitation sites with intact features exist in the Beanblossom Creek uplands (Brinker et al.1980; Munson 1980; Tomak 1997). The Late Archaic Scherschel Phase is local to northern Monroe County and was defined at the Scherschel site that is thought to have been occupied for a long period of time. Excavations revealed features and bone, nutshell, Karnak Unstemmed points, bifaces, drills, stemmed scrapers, grooved axes, pestles, hammerstones, and stone discs (Tomak 1983:72).

Woodland Period

Like the Archaic Period, the Woodland Period is partitioned into three distinct timeframes wherein mortuary and material practices are elaborated and there is increasing sedentism and social complexity (Anderson and Mainfort 2002). Although ceramic vessels are known to have been produced during the Late Archaic in the Southeast and some parts of the Eastern Woodlands, the appearance of ceramic containers distinguishes the Early Woodland from previous periods in Indiana (Kellar 1973). Marion Thick is the earliest ceramic variety in southern Indiana; vessels were generally coarse, thick-walled, flat-based, and grog, grit, and chert tempered. Subsistence practices differ little from the Late Archaic Period: hunting white-tailed deer and small animals and gardening and gathering seeds from weedy annuals remain the primary strategies. Projectile points generally decreased in size and increase in variety. Common types include: Adena, Black Creek, Cresap, Crooked Tree, Cypress, Dickinson, Gary contracting-stemmed, Kramer, Lone Tree, Meadowood, Morgan, Motley, Robbins, and Turkey-Tail (Justice 1987).

Mortuary ceremonialism, mound complexes, and intricate art and artifacts are the most well-known aspects of the Early Woodland Period, particularly as related to the mounds and complex earthworks associated with the Adena culture in Ohio and eastern Indiana. (Anderson and Mainfort 2002; Tomak 1983). Burial mounds were built around large log tombs that held interred and cremated remains and specialty artifacts and objects. Some consider Adena culture as the antecedent to later Hopewell cultures (see below). Tomak (1983) suggests that a Western Adena phase extends as far as south-central Indiana due to similarities in Early Woodland burial complexes in Greene County with Adena traditions. A small number of Adena artifacts (gorgets) have been found at some sites in Monroe County, but none in the Beanblossom Creek watershed. There are four Early Woodland sites in the project area composed of isolated finds and small lithic scatters.

In Indiana, the Middle Woodland Period (200 BC–AD 500) is synonymous with Hopewell culture. The Middle Woodland Period was a time of unparalleled ceremonialism and complexity that proliferated the wider Midwest (Anderson and Mainfort 2002; Kellar 1973; Ruby 1997; Ruby and Shriner 2005). Large mound centers in Ohio, Illinois, and southern Indiana with complex geometric earthworks that marked celestial events were centers of mortuary ceremonialism including the creation and interment of elaborate art objects in large burial mounds. The common occurrence of exotic artifacts made from obsidian, copper, and mica demonstrate the far-flung interaction networks centered in Illinois, known as Havana Hopewell, and Ohio, known as Ohio Hopewell.

The Middle Woodland Crab Orchard culture of central and southern Indiana most likely extends as far the project area, southern Illinois, and northern Kentucky (Ruby 1997). Crab Orchard may have its origins in the Early Woodland Period. Crab Orchard lacks most aspects of Hopewell ceremonialism like mounds and clay figurines but produced similar pottery styles and the prepared-core blade industry (Ruby 1997; Ruby and Shriner 2005). Subsistence strategies remained similar to previous time periods although with a growing reliance on the cultivation of weedy annuals and squash. Maize was introduced during this time but was not grown in significant quantities until the later Mississippian Period. Copena, Lowe, Saratoga, and Snyders projectile points were common, and blades were knapped from prepared cores (Justice 1987). Many different styles of ceramic decoration were developed, particularly stamped, incised, and punctate/dentate designs. There are three Middle Woodland sites in the Beanblossom Creek watershed that are more likely affiliated with the Crab Orchard culture as none produced Hopewellian objects.

The Late Woodland Period (AD 500–1200/1400) has been modeled as a devolution of the more complex Middle Woodland Period (McElrath et al. 2000:5). By AD 500, mound and earthwork construction had ceased and the far-flung movement of artifacts along interaction networks across the Eastern Woodlands had been discontinued (Abrams 2009). While Middle Woodland culture did decline and there was a pan-regional shift to less ostentatious Late Woodland lifeways, the characterization of the Late Woodland as backwards "good gray culture" (Williams 1963:297) is a misconception.

During the Late Woodland Period, people began to aggregate in large villages in the floodplains and adjacent terraces of major riverways (Emerson et al. 2000; McCord and Cochran 2008; Redmond and McCullough 2000). With increasing sedentism and larger villages, cemeteries were common near but spatially segregated from habitation areas; some cemeteries were located on adjacent bluff tops. In Indiana, mound building during this time was not unknown, but infrequent; however, in some areas of the Midwest, Late Woodland groups built monumental effigy mounds in complicated arrangements. A mixed subsistence strategy persisted, with increasing reliance on the cultivation of domesticates like weedy annuals, squash, and maize, and a slowly decreasing exploitation of nuts. During this time, there were technological advances in ceramic production as the vessels became larger and walls thinner. The bodies of vessels were generally cord-marked or plain, but necks and rims of vessels were often decorated in highly stylized ways with incised, impressed, and punctated designs, and the additions of castellations and collars.

Albee and Oliver phases are the most likely Late Woodland cultural manifestations in the project area as they were centered in in the Wabash Valley through the northern and central parts of Indiana (Redmond and McCullough 2000). Both extend past the typical end date of the Late Woodland Period at the onset of the Mississippian Period circa AD 1000. There are six Late Woodland sites in the project area and two sites designated as Late Woodland/Mississippian (SHAARD 2017). These sites were identified by the presence of small triangular points and were classified as isolated finds or small lithic scatters.

Mississippian Period, Late Precontact, and Contact (AD 1050–1700)

The Mississippian Period is characterized by the presence of large civic-ceremonial centers with pyramidal mounds and monumental architecture, maize-based agriculture subsistence, and highly complex sociopolitical and religious organizations (Pauketat 2004). Like populations of the preceding Late Woodland Period, Mississippian populations aggregated in floodplains and adjacent uplands of major riverways; in Indiana, Mississippian Period farmsteads, hamlets, villages, and mound centers are located along the Ohio and Wabash rivers in southern Indiana (Green and Munson 1978). Mississippians engaged in long distance trade throughout the Eastern Woodlands, as demonstrated through the common presence of nonlocal ceramics and exotic materials. Outside of mound building, large floodplain aggregations, and maize-based subsistence, the typical suite of Mississippian material practices and lifeways includes: wall trench architecture, shell-tempered globular vessels with increasingly thin walls and intricate decorative techniques, and small triangular arrow points. Regionally, the largest Mississippian civic-ceremonial center is the Angel Mounds site in Vanderburgh County (Black 1967).

By the 1400s, most of the large Mississippian villages along the Midwest were abandoned. An exception to the population dispersal were the large Caborn-Welborn villages in Posey County that continued for centuries after the dissolution of Angel Mounds (Munson 1995). There is significant overlap between the Angel and the Caborn-Welborn phase sites in southwestern Indiana, but relationships between Angel and Caborn-Welborn communities are not clearly understood. Similarly, up the Ohio River from Angel, Fort Ancient villages in southeastern Indiana were contemporaneous and had contact with Mississippian peoples at Angel (Cook and Schurr 2009; Pollack and Henderson 2000; Schurr 1992). Both Caborn-Welborn and Fort Ancient sites contain Euroamerican artifacts that point to contact and/or trade with the first European settlers in America (Pollack 2004; Pollack and Henderson 2000).

Late precontact sites are found in major drainages like the Ohio and Wabash, so there is little evidence of Mississippian occupation between the forks of the White River, and sites of this time period are unlikely in the Beanblossom watershed. There are only two sites in the project area designated as Late Woodland/Mississippian based on the presence of small triangular points in small lithic scatters (SHAARD 2017).

Post-Contact and Removal

During the post-contact and pre-removal era, multiple Native communities were living in what is now the state of Indiana, settling in and moving through the area now known as Monroe County (Kellar 1973). By the eighteenth century, Euroamericans had documented Algonquian language groups including different contingencies of the Miami (including the Piankashaw and Wea), Potawatomi, Kickapoo, Delaware, and Shawnee occupying the Wabash River Valley (Rafert 1996; Warren 2014). The Miami regard the upper Wabash River Valley as part of their ancestral homeland, and the Potawatomi, Kickapoo, and Delaware place their origins in more northerly or easterly contexts (Guernsey 1932). The Miami, Delaware, and other tribes, occupied Monroe County before Euroamerican contact and during initial Euroamerican settlement. At the 1795 Treaty of Greenville, Miami Chief Little Turtle claimed the entirety of the state of Indiana for the Miami, Potawatomi, and Wabash tribes (Wheeler-Voegelin et al. 1974). A series of later forced land cessions and removals by the United States Government forced Tribes from their ancestral homelands in the midcontinent to Indian Territory in what is now the state of Oklahoma (United States Government 1830).

Euroamerican Settlement

Monroe County was first occupied by Europeans in the late eighteenth and early nineteenth centuries as part of the rapid westward expansion by the French and British (Baker and Carmony 1975; Carmony 1963). Early settlers migrated north and west from Kentucky, Tennessee, the Carolinas, and Virginia to the new Ohio Valley frontier. Indiana was admitted to the union in 1816, and shortly thereafter, Monroe County was opened to land speculators and settlers. The first Euroamerican to have permanently settled in Monroe County is thought to have been hunter David McHolland in 1815 (Bowen 1914). When Monroe County and Bloomington were formally established in 1818, around 30 families had settled in Bloomington, and dozens of other individuals had acquired land. Early industry in the county included agriculture, limestone quarrying, salt mining, milling, and timber extraction. In 1820, Bloomington became the home of Indiana Seminary, which later became Indiana University (Bowen 1914). The first half of the nineteenth century marked a surge in settlement, population, industry, and development of infrastructure in and around Bloomington. The City of Bloomington was developed to the south of the Beanblossom Creek watershed. In order to use the rich water resource, portions of the Beanblossom Creek waterway were dammed: from 1911-1913 a tributary of Griffy Creek was dammed to create a water source for IU, in 1923 Griffy Creek was dammed, and in 1953, Beanblossom Creek was dammed to create Lake Lemon as a water source for residents of Bloomington. Only 28 Historic era archaeological sites have been recorded in the Beanblossom Creek drainage in Monroe County, ranging from nineteenth and twentieth century cabins, quarries, cemeteries, bridges, structures, farmsteads, and trash dumps (Table 1).

Beanblossom Creek may be named after a soldier in the 9th Indiana Volunteer Infantry Regiment who attempted to ford its floodwaters between 1810 and 1812; historical records indicate at least two residents of Monroe County in the early nineteenth century with versions of the surname Beanblossom (Schnapp 2008).

ARCHAEOLOGICAL SURVEY

METHODS

All data collection, processing, and analysis adhered to the standards and requirements contained in the *Secretary of the Interior's Standards and Guidelines for Identification Evaluation, and Archaeological Documentation* and the *Guidebook for Indiana Historic Sites and Structures Inventory—Archaeological Sites*.

It was anticipated that 50 new sites would be discovered by targeting and systematically surveying different types of landforms across the expanse of the Beanblossom Creek watershed in Monroe County. This project was conducted by GBL archaeologists and GBL student employees. The Principal Investigator (P.I.) was GBL Research Scientist Elizabeth Watts Malouchos. The field survey was conducted between June 15, 2017 and March 30, 2018.

Topography with steep ridges and ravines with over 20% slope was surveyed via walkover pedestrian survey at 30m intervals. Tilled floodplains with less than 20% slope and greater than 30% visibility were surveyed via walkover pedestrian survey at 5m intervals. Floodplains, low terraces, ridge tops, and areas with less than 30% visibility, and topography with less than 20% slope, were shovel tested at 15m intervals (30cm diameter shovel test pits, 50cm in depth or until undisturbed soil). Intervals were reduced to 5m to dig shovel test pit radials when artifacts were encountered.

Soils from the shovel tests were screened through 1/4 inch mesh. Shovel tests were documented, and soil profiles were mapped and classified according to soil color and texture. All shovel test pits were immediately back-filled upon completion. Artifacts, cultural features, positive shovel tests, and sites were documented, including marking locations using a handheld GPS. Find spots, rather than sites, were originally designated in the field, and reevaluated in the laboratory. New and discrete sites were delineated anytime there was a 50 meter break in artifact distribution. Field notes were maintained by the P.I.

All materials recovered from the project were washed, labeled, and cataloged in GBL laboratory facilities according to GBL laboratory procedures that conform to Indiana Code 312 IAC 21-3-5. Site forms of all identified sites were submitted to SHAARD. Artifacts, corresponding site assemblages, and all associated documents were assigned accession numbers and prepared for curation at the GBL repository following GBL curation procedures that conform to Indiana Code 312 IAC 21-3-7. Materials were classified by several attributes pertaining to type, function, raw material, heat alteration, surface treatment, and decoration.

SURVEY RESULTS

As stated in the environmental background discussion, the Beanblossom Creek watershed was and continues to be rich in resources and has a high probability for archaeological sites spanning the Paleoindian through Historic periods. Previously, the Beanblossom Creek watershed had 274 archaeological sites recorded in SHAARD. The survey areas total 511.5 acres in both floodplain and upland topographies at nine nature preserves located on the western, central, and eastern portions of the Beanblossom Creek watershed in Monroe County. Shovel test pit methods were used to survey 151.5 acres; 1,620 shovel test pits were excavated (1,408 negative and 212 positive). Three hundred sixty acres were surveyed via walkover pedestrian survey. While the project originally estimated the discovery of 50 new sites, the survey documented 56 new archaeological sites and one new cemetery, and revisited one previously identified site.

Artifacts

The survey recovered 833 artifacts (547 precontact and 286 historic). Cultural periods represented in the survey assemblage include unidentified precontact, Middle Woodland, and nineteenth-twentieth century historic components.

Sites

Of the 56 new and one revisited archaeological sites, 41 had unidentified precontact components (Table 2). Only one precontact diagnostic was discovered with a Middle Woodland affiliation site 12Mo1580, an isolated Steuben expanded-stem projectile point, Figure 3), 17 sites had historic components dating to the nineteenth-twentieth centuries (Table 2). Fourteen of the historic sites were composed of nineteenth-twentieth century artifacts (e.g., site 12Mo1582, Figure 4) while three sites demonstrated intact, and in the case of the University Dam, still-functioning features (see Figures 5 and 6 below). Of the 57 total sites, three demonstrated both unidentified precontact and historic components (e.g., site 12Mo1603, Figure 7).

Table 2. Frequency of Newly Discovered Sites by Cultural Affiliation.

Period/Phase	Frequency of Sites by Component
Unidentified Precontact	41
Middle Woodland	1
Historic	17

Site 12Mo035 on the Indiana University Teaching and Research Preserve was previously recorded as an unidentified precontact scatter with chips, points, and hammerstones on the surface. The site was revisited, and two Harrodsburg flakes were recovered in shovel tests, but did little to resolve the unidentified precontact component.

Site 12Mo1574 is a historic nineteenth-twentieth century farmstead/homestead with remains of several features: a large concrete-block building foundation, a cistern, a well, a small limestone storage/outbuilding, and some small concrete pads; no artifacts were found in association. Site 12Mo1617 is the remains of a historic railway bed carved out of the bedrock that cuts across the Indiana University Research and Teaching Preserve, initially constructed by the Southern Indiana Railway from 1903-1904 prior to abandonment (Indiana University Research and Teaching Preserve 2011) (Figure 5); no artifacts were collected in association. Site 12Mo1613 is a historic, early twentieth century dam that blocks a southern tributary of Griffy Creek and creates University Lake. The dam was built between 1911-1913 by IU to create University Lake as a water supply for the university in response to an urgent need for potable water on campus (IU GRTP Ten Year Report 2011). Although not used as a source of water any longer, the dam still functions to contain University Lake reservoir, which is now used for research and recreation (Figure 6).

We recorded the Restle Cemetery, which is a historic cemetery and is still in use by the Restle family. There are three primary headstones and four interments. The earliest interment is Robert Clark that dates to 1848 (Figure 8). The Restle family added a new headstone next to Clark's original headstone because of the rapid deterioration of the stone's facade. The other three interments are members of the Restle family dating from 1958-1980. The Restle family also added a bench for visitation.

Figure 3. Middle Woodland Steuben expanded stem/Lowe Cluster projectile point from 12Mo1580. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

Figure 4. 1954 Coca-Cola bottle manufactured in Bloomington, Indiana from 12Mo1582. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

Figure 5. Excavated and abandoned 1903 railbed depression from 12Mo1617. View to west. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

Figure 6. 1911 University Dam at University Lake from 12Mo1613 is a stepped arched dam made of concrete. View to south. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

Figure 7. Unidentified precontact artifacts (left) and historic artifacts (right) from multi-component site 12Mo1603. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

Figure 8. 1848 limestone headstone for Robert Clark at Restle Cemetery. View to north. Image courtesy of the Glenn A. Black Laboratory of Archaeology and the Trustees of Indiana University.

DISCUSSION AND CONCLUSIONS

RESEARCH QUESTIONS, GOALS, AND DISCUSSION

The general purpose of this survey was to identify archaeological and cultural resources in rapidly developing and data deficient Monroe County, evaluate the nature and affiliation of resources, and to assess their eligibility for the Indiana Register of Historic Sites and Structures and for the National Register of Historic Places (NRHP). The overarching research goals of this project were threefold:

1) Refine the local cultural chronology.

2) Enhance our understanding of pre and post-contact settlement patterns in the Beanblossom Creek drainage.

3) Assess how changes and advances in survey methodology and State-mandated methodological standards have affected the identification and preservation of sites.

Goal 1: Refine the cultural chronology for northern Monroe County.

The Beanblossom Creek watershed has been an attractive place for settlement from Indiana's early Indigenous inhabitant to the first Euroamerican settlers; however, relative to other areas of the state, Monroe County is underrepresented in archaeological research. This project aimed to produce unique and valuable archaeological data that would enrich understandings of the deeper history of the northern portion of the county and help build and refine local, regional, and statewide chronologies.

While we did discover 56 new archaeological sites, the majority were unidentified precontact isolates or small scatters, and the historic sites discovered very likely post-date the turn of the twentieth century (Table 3). Unfortunately, these site types do little to refine the local chronology. One isolated find was diagnostic to the Middle Woodland Period, bringing the total number of Middle Woodland sites in the county up to 11 (see further discussion below).

Table 3. Frequencies of Site Types.

Period	Isolated Finds	Scatters	Other
Middle Woodland Lithics	1	0	0
Unidentified Precontact Lithics	18	23	0
Historic Artifacts/Architecture	4	8	Refuse Dump: 2 Railbed: 1 Dam: 1 Farmstead:1

Goal 2: Enhance our understanding of how the Beanblossom Creek watershed has been settled in the past and how occupations change through time, particularly during the Archaic and nineteenth century Historic Periods.

Investigating the landscape of the Beanblossom Creek waterway has the high potential to provide new data for sites dating to the Archaic Period (see Table 1). Unfortunately, this project did not produce any diagnostic artifacts associated with any of the Archaic periods. The prevailing theory suggests that Early Archaic peoples in southern Indiana were mobile hunter-gatherers, utilizing all locations and landforms throughout watersheds (Stafford and Cantin 2009). By the Late Archaic, it has been argued that settlement patterns shifted to favor bottomland environments of higher order waterways to support an increasingly sedentary lifeway. According to the sites already identified in the Beanblossom Creek watershed (Table 4), there does appear to be a trend toward increasing habitation of bottomland areas, although this brief assessment is inconclusive for a variety of reasons (bias in areas surveyed, effects of site formations processes on site detection, etc.).

Table 4. Percent of Archaic Sites in the Beanblossom Creek Watershed located in Uplands Versus Bottomlands.

Period	Percent (%) Upland Sites	Percent (%) Bottomland Sites
Early Archaic	90.47	5.53
Middle Archaic	100	0
Late Archaic	65.22	34.78

Despite the lacuna in Archaic settlement data and pre-twentieth century historic sites, the project's one diagnostic precontact find, a late Middle Woodland Steuben projectile point, offers an interesting insight: Of the 11 Middle Woodland Period sites recorded in Monroe County (including this survey), nearly half are located in the Beanblossom Creek watershed (n = 5, 45.45%). This observation may suggest that the Beanblossom Creek bottomlands were more heavily occupied than the wider county, however, this observation is inconclusive for a variety of reasons (bias in areas surveyed, effects of site formations processes on site detection, etc.).

Although it is possible that some of the whiteware, stoneware, and glass found at some of the historic sites identified by this survey date prior to 1900, it is much more likely they are early to mid-twentieth century based on the proliferation of diagnostic glass containers found in association dating from 1930-1960. It is very unlikely any of the newly identified historic sites are Pioneer Period, and more likely, the historic scatters found are the result of rural refuse disposal practices during the mid-twentieth century.

Goal 3: Evaluate how changes and advances in survey methodology and State-mandated methodological standards have affected the identification and preservation of sites.

According to SHAARD and the State Site Files, the Glenn A. Black Laboratory of Archaeology (GBL) conducted a Phase I survey of the Beanblossom Creek in 1978, recording 23 previously undocumented sites dating to the Early and Late Archaic, Late Woodland, Late Woodland/Mississippian, and unidentified precontact periods. However, the survey heavily favored known site locations and areas that were freshly plowed agricultural fields. The 1978 survey was limited to the far western extent of the Beanblossom Creek watershed: the floodplain and adjacent-south bluffs of the West Fork of the White River just north and south of the currently defined limits of the Beanblossom Creek watershed (Schnapp 2008). The survey methodology employed was predominantly pedestrian survey, even, in many cases, when visibility was less than 30% (SHAARD 2017). When subsurface probing was implemented, it was neither systematic nor standardized for each area surveyed. This project provided a unique opportunity to compare the results of the proposed survey with the results of the previous 1978 Beanblossom Creek survey. How have changes in methods and standards affected the number of sites identified?

The 1978 survey did not record the extent of the areas they surveyed, but based on the clustered location of 21/23 sites recorded as part of the survey, the project estimated the survey acreage covered for two areas of the survey: 444 acres of tilled agricultural fields in the floodplain and 60 acres of forested ridge/hill tops. While this is just an estimate, it allows a more general comparison of densities of sites discovered per acre between the two surveys by landform (i.e., floodplain versus ridge/hill top) (Table 5).

The 1978 survey averaged one site discovery per 29.6 acres of floodplain landscape surveyed and one site discovery per 12 acres of upland landscape surveyed. The 2017 survey averaged one site per 3.77 acres of floodplain landscape surveyed and one site discovery per 4.48 acres of upland landscape surveyed (Table 5).

This brief analysis suggests that even when landforms and areas with high potential for cultural resources and known sites are "cherry-picked" with pedestrian survey, more sites are discovered using the contemporary systematic methods and State-mandated standards. In particular, this comparison demonstrates that shovel testing at 15 meter intervals and pedestrian survey at 5 meter intervals in floodplain landscapes significantly increases the discovery of sites.

Table 5. Density Estimates for Acres Surveyed per One Precontact Site Discovered during the 1978 and 2017 Surveys.

Survey	Floodplain Density (acres per site)	Upland Density (acres per site)
1978	29.6	12
2017	3.77	4.48

CONCLUSIONS

This project targeted the Beanblossom Creek drainage, including adjacent upland areas, in northern Monroe County, Indiana due to the identification of Monroe County as a data deficient county and the high potential for archaeological resources. The goals of the project were to increase the number of sites recorded in SHAARD, refine the cultural chronology for the county, and better understand settlement patterns and changing occupation of the landscape, particularly during the Archaic and early Historic periods.

This project surveyed 511.5 acres in both floodplain and upland topographies at nine nature preserves located on the western, central, and eastern portions of the Beanblossom Creek waterway in Monroe County. Shovel test pit methods were used to survey 151.5 acres; 1,620 shovel test pits were excavated (1,408 negative and 212 positive). Three hundred sixty acres were surveyed via walkover pedestrian survey.

Previously, the Beanblossom Creek watershed had 274 archaeological sites recorded in the SHAARD (2017). While we originally estimated the discovery of 50 new sites, the survey documented 56 new archaeological sites and one new cemetery, and revisited one previously identified site. The survey recovered 833 artifacts (547 precontact and 286 historic). Cultural periods represented in the survey assemblage include unidentified precontact, Middle Woodland, and nineteenth-twentieth century historic components. Only one site, 12Mo1613 University Dam, was deemed potentially eligible for evaluation for the Indiana Register of Historic Sites and Structures or the National Register of Historic Places. The Beanblossom Creek watershed and northern Monroe County more widely would benefit from further archaeological investigations, particularly those focusing on the recovery of diagnostic precontact artifacts.

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GLOSSARY OF TERMS

A-HORIZON SOIL
The upper layer of soil, nearest the surface.

ANTHROPOLOGY
The study of humankind, with particular emphasis on its cultural and biological adaptations.

ARCHAEOLOGY
The anthropological study of past lifeways, cultures, and cultural processes through the investigation of material remains left behind by humans.

ARTIFACT
Any portable object made, used, and/or modified by humans. Or, more generally, any evidence of human behavior. Common precontact artifacts found archaeologically include spear points, arrowheads, knives, chipped or broken stone debris, ground stone axes, grinding stones, mortars and pestles, awls, adzes, gouges, pottery, clothing and ornamental pins, decorative items and ornaments, scraping tools, hammerstones, bone fishhooks, stone perforators, and beads.

ASSOCIATIONS
The relationships of artifacts and features at a site, based on provenience and context.

ATLATL
A spearthrower.

AVOCATIONAL ARCHAEOLOGIST
A person who participates in archaeology but does not practice it as a profession. Avocational archaeologists may volunteer to work with qualified professional archaeologists, and many take courses and gain substantial experience in archaeological methods and techniques. Others may be involved in archaeology as a hobby. Generally, avocational archaeologists subscribe to a preservation ethic to protect archaeological resources and to responsibly and legally preserve and study information from sites.

BP
Before present. By professional agreement present was established to be AD 1950 based on radiocarbon dating. For example, 1000 BP means 1,000 years before AD 1950, or AD 950.

CELT
An ungrooved axe. Celts may be made of pecked and ground stone, or hammered copper. It is thought that celts appeared in Late Archaic times, and they continue to occur through later prehistory.

CERAMICS
Pottery vessels or potsherds.

CHERT
Stone of microscopic or small quartz particles used for the making of stone tools. Some types of chert include flint, agate, and jasper.

CHIEFDOM
A non-egalitarian hierarchial social organization with a fixed and permanent role for a chief/leader.

COLLARED
A thickened area present below the rim and above the neck on a clay pottery vessel.

COMPLICATED STAMPED
Decorations of curvilinear or rectilinear design paddle stamped into a clay vessel.

CONTEXT
The position of an artifact or feature in its soil matrix, horizontal, and vertical location, and its relationship with other artifacts and features, related to the behavioral activities which placed it there.

CORD-IMPRESSED
Impression into a clay vessel surface before firing by a stick wrapped with cord, or cord on the edge of a paddle.

CORDMARKED
Cordage impressions on a pottery vessel as a result of stamping with a cord-wrapped paddle.

CORE
A stone which exhibits one or more flake scars, showing that it has been used as a raw material for flintknapping.

CRM
Cultural resource management. The protection, preservation, and recovery of information from archaeological sites, under federal and state laws. Universities and private archaeological companies often are hired to conduct CRM archaeology mandated under federal or state statutes.

CULTURE
A system of shared, learned, symbolic human behavior for adaptation to our natural and social environment. Culture may be thought of as a system composed of interrelated parts or subsystems, where a change in one part affects or influences the other parts. Subsystems interrelated with culture include technology, communication (and language), biological and physical characteristics, psychology, economics, social and political organization, beliefs and values, subsistence, settlement, environment, etc.

EXCAVATION
The systematic recovery of archaeological deposits through the removal and screening of soil. These can be either test excavations (termed Phase II in CRM investigations) or large-scale excavations (termed Phase III in CRM investigations).

FABRIC-IMPRESSED
Impressions of woven fabric in the surface of a pottery vessel.

FEATURE
Non-portable evidence of past human behavior, activity, and technology found on or in the ground. Precontact features commonly include fire pits and hearths, burned earth and clay, trash and garbage pits, post molds, evidence of house floors or basins, storage pits, clusters of artifacts (e.g., chipped and broken stones, caches of projectile points, ceramics or pottery sherds), human and animal burials, clusters of animal bone, earthworks (such as mounds and circular enclosures), petroglyphs and pictographs, and middens.

FLAKE
A by-product of flintknapping, toolmaking, use, or other human activities, resulting in a fragment of stone detached from a parent stone. Often, a flake has evidence of purposeful removal, including a bulb of percussion, ripple marks, a striking platform, etc.

GORGET
Decorative object worn on the chest.

GROG-TEMPERED
Ceramics tempered with fragments of crushed pottery.

LITHICS
Stones used or modified for human activities such as the manufacture of precontact tools, cooking, hunting, etc.

MICROTOOLS
Small tools, predominately of stone, manufactured and used to perform certain tasks.

MIDDEN
Cultural refuse or deposits built up at a site.

MULTICOMPONENT
An archaeological site with occupations from more than one culture or time period.

PETROGLYPHS
Naturalistic or symbolic representations or depictions carved into stone.

PICTOGRAPHS
Pictures or drawings painted on rocks, cave walls, stone outcrops, or rockshelters.

PRECONTACT
Human activities, events, and occupations before written records. In North America, this primarily includes Native American precontact cultures, but does not imply that these cultures did not have long, rich, and varied cultural and oral histories and traditions.

PROTOHISTORY
Protohistoric cultures can be defined as those precontact groups developing or continuing directly into early recorded history, some associated with early historic artifacts.

PROVENIENCE
The horizontal and vertical location of an artifact at a site.

RED OCHRE
Late Archaic-Early Woodland culture with burial practices, usually in mounds, involving the use or placement of red ochre (a red hematite pigment).

SHAARD
The Indiana State Historic Architectural and Archaeological Research Database (SHAARD) of the Division of Historic Preservation and Archaeology.

SHELL-TEMPERED
Ceramics (pottery) tempered with fragments of crushed shell.

SITE
The presence or occurrence of one or more artifacts or features indicates an archaeological site. An archaeological site is an instance of past human behavior or activity, where humans conducted some activity and left evidence of it behind, on or in the ground. Some common precontact site types include artifact caches, villages and camps, cemeteries, burials, workshops (e.g., stone debris from flintknapping activities), quarries, and earthworks (mounds, embankments, enclosures, fortifications, etc.).

STRATIGRAPHY
Horizons, strata, or layers of soil deposited at a location, where the deepest strata were deposited the earliest, and the more recent layers deposited higher in the stratigraphic sequence.

SURVEY
The systematic discovery, recovery, and recording of archaeological information such as site locations, artifacts, and features by visually inspecting the surface of the ground if the soil is visible. Or, the use of shovel probes, cores, and/or augers near the surface, if surface visibility is restricted or poor. Termed Phase I in CRM investigations.

TEST EXCAVATION
Systematic excavation of a representative portion or percentage of a site to evaluate and determine its nature and extent, what information is present, whether there are intact or in situ deposits present, and the degree of disturbance to the site, often to determine whether it is eligible for the National Register of Historic Places. Termed Phase II in CRM.

WYANDOTTE
A type of dark blue-gray chert found in southern Indiana.

For those with access to the internet, the following sites also provide opportunities to access definitions and additional information regarding archaeological terms and concepts:

http://www.archaeological.org/education/glossary
http://archaeology.about.com/od/rterms/g/radiocarbon.htm

PRECONTACT INDIANS OF INDIANA

PALEOINDIANS:

Paleoindians are the first known people who lived in the Americas, including Indiana. They lived here during the last stages of the last glacial advance, or ice age, and the early part of a changing environment and climate as the glaciers retreated. These people occupied the area now known as Indiana some 12,000 years ago, and lasted until about 10,000 years ago.

These early peoples probably lived in small groups of related individuals who moved around a lot, hunting large game animals, including some now extinct, such as the Mastodon, a large elephant-like creature. They also relied upon the gathering of wild plants to eat for their survival. Their population was very low.

The Paleoindians had very well-made stone tools, made out of a type of stone archaeologists call chert, which is a fine-grained rock that breaks a little like glass when hit by hard materials like another rock or a piece of deer antler. The tools they made by chipping, flintknapping, and flaking included long spearpoints, cutting and scraping implements, and engraving items. Some of their spear and piercing tools are called Clovis, Gainey, Barnes, Cumberland, Holcombe, Quad, Plainview, Hi-Lo, and Agate Basin points.

Evidence of these peoples is often found in Indiana on land near water sources like major rivers and springs, and where chert is found. Little is known about the Paleoindians since they moved around a lot and did not occupy any one place for a very long time. Therefore, they did not leave behind much evidence of their lives in any one place.

ARCHAIC PEOPLES:

American Indians known as the Archaic peoples lived here for a long time: some 6-7,000 years. Although these people did change over time, increasing in population and using new tool types and food preparation techniques, they did share certain general characteristics. These included new types of spear points and knives, with various types of notches and stems for hafting to wooden handles and shafts. Some of the projectile point types of the Archaic Period are called Kirk, Thebes, MacCorkle, LeCroy, Faulkner, Godar, Karnak, Matanzas, Brewerton, Riverton, and Terminal Archaic Barbed points.

They also used ground stone tools such as stone axes, woodworking tools, and grinding stones. The grinding stones were used to pound, crush, and grind wild nuts, berries, seeds, and other plant foods. They were hunters and gatherers of wild plants and animals, and moved around in their natural environments by season, often scheduling their movements to coincide with the appearance of foods like nuts, fish, deer, and wild seeds. Over time, they became very selective in what kind of resource they were pursuing.

During the Archaic Period, the spearthrower was used. This consisted of a shaft with a handle, weighted for balance with a ground and smoothed stone, and a hook on the end. A spear was fitted onto the hook, and was thrown with the spearthrower shaft.

Toward the end of the Archaic, more evidence of mortuary activities is found, including human burials with a red pigment coloring remains or grave goods. Burial mounds appear. During the Archaic, the cultures became more different from one another, and more types of artifacts were used. Their settlements became more permanent. One type of settlement was along large rivers, where they discarded large amounts of mussel shells. These sites are called shell middens or "mounds," although they are not really constructed, burial mounds. The general Archaic Period ended at about 1500 BC, although some Terminal Archaic peoples lived until 700 BC.

WOODLAND PEOPLES:

During the Woodland Period, a number of new cultural characteristics appeared. A notable event was the appearance and use of ceramics and pottery vessels. Another significant occurrence was the use and increase of horticulture. A remarkable feature of some Woodland sites is earthen mounds and earthworks, such as embankments. The Woodland peoples persisted for over 1,500 years in Indiana.

During the early portion of the Woodland Period, the pottery was thick and heavy. One early Woodland culture called the Adena people had elaborate mortuary rituals, including log tombs beneath earthen mounds. Projectile points during this time included Adena, Kramer, Dickson, and Gary Contracting Stemmed types.

A little later, in the Middle Woodland, there were elaborate burial rituals, but also long-range trade of exotic goods like mica, marine shells, copper, obsidian, copper axes, drilled wolf and bear teeth, and other goods from region to region throughout the Eastern Woodlands area of North America. Some of these groups were called Hopewell peoples. Their ceramics had all kinds of incised and stamped decorations. During this time, the Woodland Indians were likely organized into groups we might recognize as what we today call tribes. Projectile points from the Middle Woodland include Snyders, Lowe Flared Base, Steuben, Chesser, and Baker's Creek.

The latter part of the Woodland Period is called Late Woodland. In Late Woodland, two important events occur. One is the first appearance of agriculture; that is, intensive cultivation and modification of crops such as corn and squash. Another important occurrence is the appearance of the bow and arrow. Before this time, most of the chipped stone tools were either spearheads, knives, engraving tools, or scrapers. In Late Woodland, however, small, triangular points occurred that are true arrowheads. One type of these arrowheads is called Madison. Other point types are termed Jack's Reef Pentagonal and Raccoon Notched. Settlement during the Late Woodland time changed from the earlier more permanent and nucleated villages to a pattern of smaller sites dispersed more over the landscape. In some regions of the state, Woodland groups may have persisted almost until historic times, although in general, the Woodland Period ended at AD 1000.

MISSISSIPPIAN PERIOD:

The Mississippian peoples In Indiana lived in some cases almost until contact with early European explorers, missionaries, soldiers, and traders. They lived from about AD 1000 until possibly as late as AD 1650. A noticeable change during this period was the nucleation of some peoples into large settlements akin to "towns," such as at the Angel Mounds site near Evansville, Indiana. These towns had large public areas such as plazas and platform mounds—like truncated or flat-topped pyramids—where influential or important public individuals lived or conducted rituals. Thus, there was social stratification and ranking of individuals in Mississippian societies. There were probably chiefs and religious leaders. The towns were supported by the harvesting of large agricultural fields growing corn, beans, and squash. People living in sites such as these are termed Middle Mississippian.

Notable artifacts indicating Mississippian settlements include large, chipped stone hoes, and pottery bowls and jars tempered with crushed shell. Straps, loops, and handles for these containers characterize this time period as well. Stone tools include point types known as Madison, Nodena, and Cahokia, and other implements such as mortars, pestles, pendants, beads, anvils, abraders, and other items.

Another less elaborate type of Mississippian society called Upper Mississippian was present in the state, with people living in hamlets and villages. Many of these people lived in northern and southeastern Indiana. They also grew and harvested maize, beans, and squash. One group to the southeast was called Fort Ancient, and lots of shell-tempered vessels with straps are found at these sites. In northern Indiana, incised shell-tempered pottery fragments are found on Upper Mississippian sites that are often located near the beds or former beds of lakes.