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Note: 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 submissions included in this volume were also reviewed by the DHPA staff HPF archaeology grant liaisons.

INTRODUCTION

This volume of the journal highlights archaeological projects which took place at Chain O'Lakes State Park in Noble County as well as Loblolly Marsh Nature Preserve and Limberlost Swamp Conservation Area in Jay County. Both projects received federal financial assistance from the Historic Preservation Fund ("HPF") Program for the identification, protection, and/or rehabilitation of historic properties and cultural resources in the State of Indiana. Investigations such as these assist the Department of Natural Resources in identifying and managing cultural resources which are present, and also help with providing interpretation for the public regarding archaeology sites.

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 lay 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 on.in.gov/archaeo-pubs.

• We appreciate the peer reviews from archaeology colleagues.

—ALJ

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ARCHAEOLOGICAL SURVEY OF MULBERRY SCHOOLHOUSE AND PRESUMED AMERICAN INDIAN VILLAGE IN CHAIN O' LAKES STATE PARK, NOBLE COUNTY, INDIANA

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INTRODUCTION

Funded by a FY21 Historic Preservation Fund (HPF) grant and administered by the Indiana Division of Historic Preservation and Archaeology, a total of 65.32 acres (ac) (26.43 hectares [ha]) of Chain O' Lakes State Park (COLSP) was surveyed by the Applied Anthropology Laboratories (AAL) in 2021. The project goals were to 1) investigate the location of historic-era Mulberry School and a presumed contact-era American Indian village; and 2) increase the number of sites in the State Historic Architectural and Archaeological Research Database (SHAARD), and identify any SHAARD discrepancies. The project results provided a more thorough context for both the historic school and the precontact village, as well as provided data to the Indiana Department of Natural Resources (DNR) to use in additional cultural resource and property management planning. AAL archaeologically investigated two survey areas including 15.07 ac (6.10 ha) around the extant foundation of the Mulberry School, and 50.25 ac (20.34 ha) around the presumed contact-era American Indian village. The survey identified seven new archaeological sites (12NO319 through 12NO325) and reinvestigated two sites (12NO298 and 12NO310). These surveys yielded new documentation of both historic and precontact components. In total, 268 historic artifacts and 16 precontact artifacts were recovered. Ten features were documented.

COLSP is located in Green Township, Noble County, Indiana, and encompasses approximately 2,718 ac (1,100 ha) of lakes and forested recreational land. Below key survey results are highlighted from the reinvestigation of the historic schoolhouse (site 12NO310), and of the presumed American Indian village (12NO298). Results of this project provide new information on the knowledge gained from the previous investigations of these sites. Newly discovered sites also add insight into the history of the area and support evidence for the reported American Indian village.

HISTORY OF CHAIN O' LAKES STATE PARK

Within COLSP and Noble County, sites and site components indicate that American Indians inhabited the region as early as the Paleoindian period and through the Historic period. The land that is now COLSP was occupied from the Paleoindian period around 10,000 years ago through the Protohistoric period, which is marked by Euro-American expansion and displacement of American Indians. This area was the homeland of the Potawatomi and Myaamia (Miami) people. The Delaware, Shawnee, Wyandotte, and Ottawa also lived in, or near, what is now Noble County before removal (Kappler 1904; Olsen 2020:3; United States Government 1828). The land that is present day COLSP was ceded to the U.S. by the Potawatomi in the Treaty of St. Joseph in 1828. Nearby land was ceded to the U.S. by the Miami in the Treaty of Mississinewa in 1826 (University States Government 1826, 1828).

John Bristol and his family were the first Euro-American settlers of what is now Noble County in 1827 (Goodspeed and Blanchard 1882:24-27; Strange 2018:141). The first Euro-American settlement in what is now COLSP was established near one of the lakes in the 1830s, and historical records report the presence of an American Indian village concurrent with this settlement (Goodspeed and Blanchard 1882:268). Noble County was established in 1836 by an act of the Indiana General Assembly. In addition, multiple historic era schoolhouses once existed in the area that is now COLSP; the Stanley Schoolhouse is still standing today.

The idea to create a recreational park in Green Township started in the 1930s. A survey was conducted to determine the exact location of the park. The Indiana Legislature appropriated a starter fund to buy the land, and taxes from Allen, Whitley, and Noble counties were used to raise the remaining $250,000 needed. The Chain O' Lakes Joint Park Board purchased the first tracts of land in 1956. In 1959, another land purchase was made, and the park was dedicated on June 12, 1960. Today COLSP totals 2,718 acres (1099.94 ha) (Strange 2018:142-143).

THE HISTORIC SCHOOLHOUSES AND SITE 12NO310

The Indiana State Constitution of 1851 and the School Law of 1852 established the foundation for a public-school system in the state. Before these laws, most Indiana schools were locally organized and funded (Landon et al. 2006:6; Sharkey 2020). Despite these requirements, Indiana's school system was not strongly established until after the Civil War (Sharkey 2020). The majority of Noble County one-room rural schoolhouses were built between 1867 and 1887. Most were brick structures that replaced the early log schools built before the public-school system was organized. The updated brick schools were built strategically within townships so no child would have to walk more than two miles to school (Landon et al. 2006:6-7). A log schoolhouse was established on the site around 1845 (Goodspeed and Blanchard 1882:275). A "fine brick country school building" was built to replace the original Mulberry School by William Davis in 1873 (Goodspeed and Blanchard 1882:275), and the school is shown on Davis's property on an 1874 Illustrated Historical Atlas of Noble County (Figure 1) (Durant and Durant 1874:30). It operated as a school until 1930, closing due to the consolidation trend of many one-room schoolhouses that began in the 1920s. The Stanley School, also within COLSP, was the last of the schools to close in the township, in 1954 (Landon et al. 2006:20; Strange 2018:144).

Survey Area 1 (SA1) consisted of 15.07 ac (6.10 ha) surrounding the extant foundation of the Mulberry School, and was surveyed using shovel test probes (STPs) and geophysical methods. No new archaeological sites were discovered in SA1. The Mulberry School was reinvestigated, and SHAARD form 12NO310_R1 was submitted. The site is a 1.05-ac (0.42 ha) area with dense vegetation and secondary growth. This reinvestigation was the first systematic archeological investigation of the Mulberry School to map features and collect artifacts. The features and artifacts found are consistent with the interpretation of the site as a historic schoolhouse. This site consists of several relatively well-preserved features and associated artifacts from the Mulberry School.

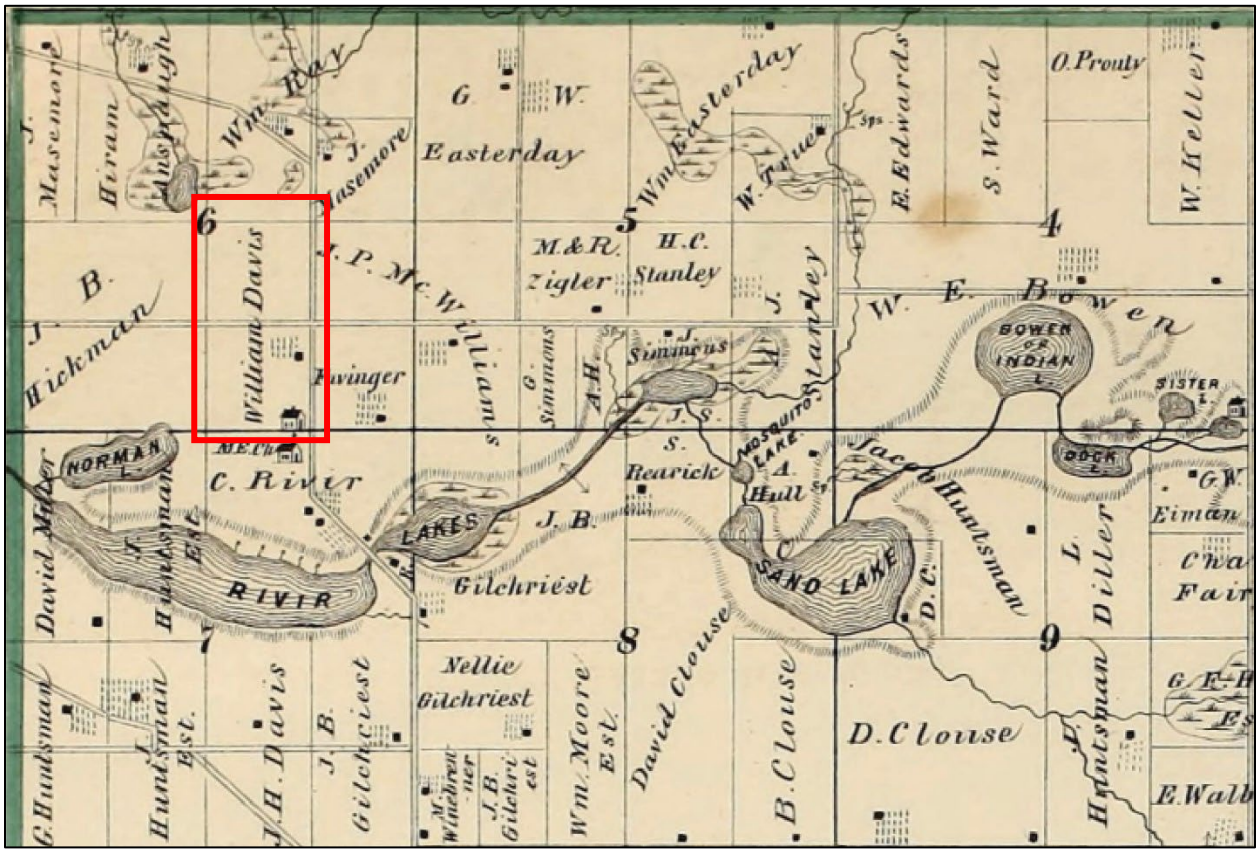

Figure 1. Excerpt from "An Illustrated Historical Atlas of Noble County" (Durant and Durant 1874:30) depicting the location of the Mulberry School in relation to William Davis's property (in red).

There were 236 historic artifacts recovered from the surface and in STPs within site 12NO310. No precontact artifacts were recovered. Artifacts included brick, charcoal, glass, ceramic, metal, slate, animal bone, and slag. The most diagnostic schoolhouse artifact was a decorative desk leg (Figure 2). The desk leg has a hole in the top where it was attached to the top part of the desk. The desk leg collected was likely from a “fashion” desk as it was decorated with metal filigree. “Fashion” desks were first designed and produced beginning in the 1880s. These desks were more decorative than previous school desks and consisted of cast iron legs, wooden desktops with an ink well, and an attached bench (Akanegbu 2012; Museum of Teaching and Learning 2021). This style of desk was produced until the 1920s (Akanegbu 2012).

Figure 2. Piece of decorative "fashion desk" found at site 12NO310 (photo by Zoe Lawton, Ball State University).

There were three features identified within site 12NO310, including the school foundation, a rock cluster within the foundation, and a possible privy. A geophysical survey of the existing foundation revealed more complete walls than are visible on the surface. In the amplitude slice centered at 58 cm below the ground surface (Figure 3, on the left), an internal feature can be seen in the northeast corner of the structure. This image also shows that the north and east sides of the foundation likely had some architectural features such as a porch or stairs. However, since these features are not visible in the 1910 photograph of the school (Figure 4), it could be that these are: 1) not related to the intentional architecture but are debris fall; 2) possibly earlier footprints of a previous structure or structures; or 3) features related to the construction process of the current existing foundation.

The possible privy is located around 6 m south of the school. A series of depressions were observed on the surface within a roughly rectangular area. Three ground penetrating radar (GPR) profiles were collected across the possible feature (Nolan 2022:Figures 27-28). In the profiles, you can see the slump of the surface beginning around 1 m across the profile, returning to the surface around 4.5 m (Figure 5). There are potentially two somewhat distinct fill episodes at between 2.5 and 4.5 m along the profile at 1.5 m and 1.75 m below surface, respectively (red lines in Figure 5). Multiple animal burrows disturb the top of the privy, but this is likely related to the ease of excavating the already loose feature fill compared to the surrounding soils.

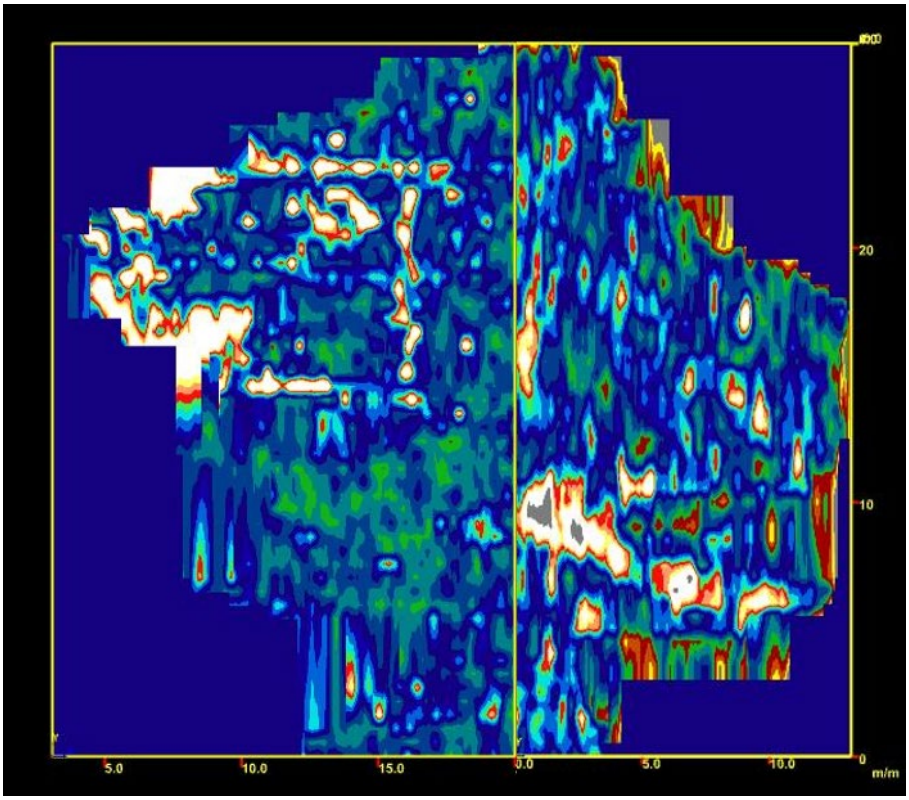

Figure 3. Amplitude slices, 58 cm below ground surface x 25 cm thick on the left; and 59 cm below ground surface x 30 cm thick on the right, from the GPR of site 12NO310 revealing the detailed remnant foundation and several auxiliary features.

This site is recorded as a Historic School. Not only were these schoolhouses a location for children to learn, they also served as community gathering spaces. According to historical records, the Mulberry School was one of the earlier constructed schools in the area during the educational reform era. This site has the potential to further expand our knowledge of rural life in Noble County, and additional fieldwork is recommended. The geophysical survey indicates the presence of a privy and other intact features that were not explored during this survey. The data generated by such investigations could inform future cultural and natural resource management plans for COLSP and potentially be useful in further understanding the history of the community and its engagement with early education. Additionally, data gained from further investigation could be used to develop local history interpretations for the public. Therefore, site 12NO310 is recommended potentially eligible for the National Register of Historic Places (NRHP) under Criteria A and D (36 CFR § 60.4[a, d]). The site is also recommended to be potentially eligible for inclusion to the Indiana Register of Historic Sites and Structures (IRHSS).

Figure 4. 1910 photo of Mulberry School (Landon et al. 2006).

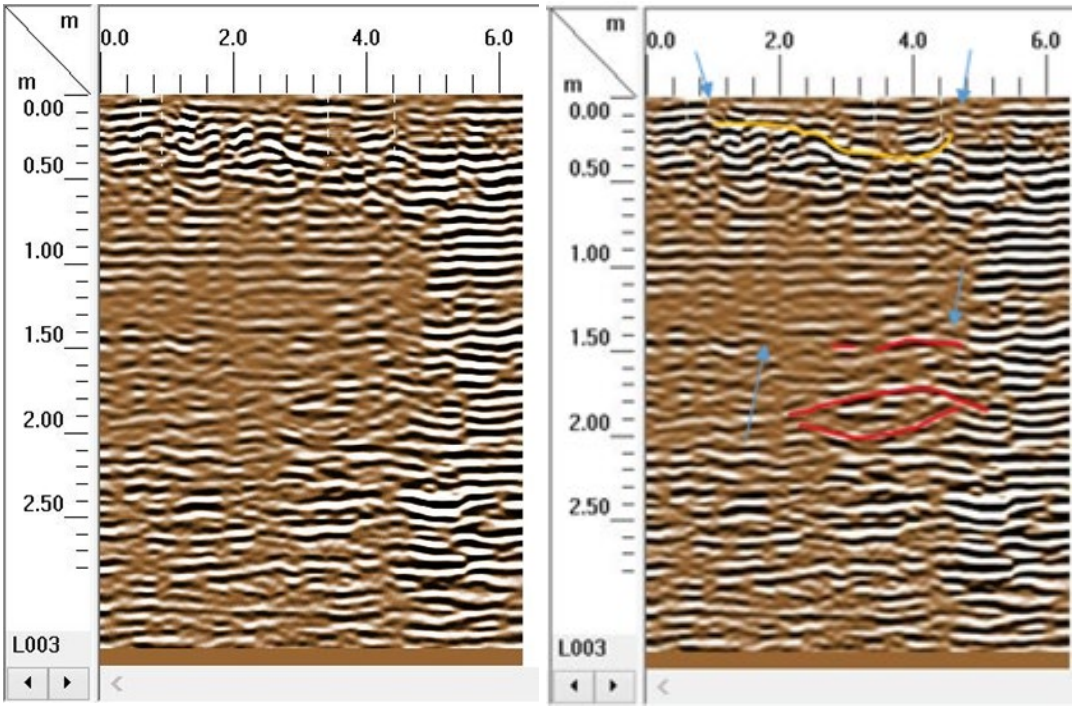

Figure 5. GPR profile of possible privy feature (left), and interpreted features (right). Blue arrows: incisions through background layers/horizons; Red lines: fill deposits within feature; Orange line: slumping upper surface within feature. Copied from Nolan (2022:Figure 28; see also Ryker et al. 2022:Figure 63).

THE PRESUMED AMERICAN INDIAN VILLAGE

Survey Area (SA2) is located on a terrace landform. This type of landform would have been attractive to precontact and contact-era peoples and historic reports support the presence of a contact-era American Indian village (Goodspeed and Blanchard 1882:24-27). The abandonment of this village likely represents the forced removal of American Indians, as the timing of Euro-American settlement of the area coincides with forced Potawatomi (1838) and Miami (1846) removals in Indiana (Citizen Potawatomi Nation Cultural Heritage Center 2022; Hunter 2021; Miami Tribe of Oklahoma 2011:3). Currently, there is little information available about the contact-era American Indian groups of COLSP and the surrounding area despite historical records indicating that they were present (Goodspeed and Blanchard 1882:24-27; Royce 1899).

SA2 consisted of 65.32 ac (26.43 ha) investigated with STPs. Eight sites were discovered within SA2, including a reinvestigation of 12NO298 and new sites 12NO319 through 12NO325. Site 12NO298 was originally identified by an extant concrete foundation, and was investigated by a Indiana University-Purdue Fort Wayne Archaeological Survey (Arnold and Graham 2013:122-124). This 2013 research focused on the reported contact-era American Indian village and a historic homestead. Based on historical documents and other sources, Arnold and Graham determined the reported village was likely home to a group of Miami people. This initial investigation classified the site as an Unidentifiable Prehistoric Lithic Scatter as well as a Historic Agricultural Settlement and Farmstead (Arnold 2013). The artifacts recovered included animal bone, brick, copper/brass, fire cracked rock, glass, historic ceramic, iron/steel, precontact ceramic, and shell (Arnold 2013; Arnold and Graham 2013:117,120).

AAL's reinvestigation of 12NO298 was conducted with the goal of locating evidence of the American Indian village and increasing our understanding of the daily life of the Miami during the contact era. Our reinvestigation results expanded site boundaries, now measuring 6.39 ac (2.59 ha), which is much larger than the original site size. During this reinvestigation, site form 12NO298_R1 identifies the site as a Prehistoric Lithic Scatter and Historic Scatter. There were 34 historic and 11 precontact artifacts recovered from surface collection and STPs.

The historic artifacts found during our resurvey support Arnold and Graham's conclusion that site 12NO298 was an historic farmstead. A total of 11 ceramic artifacts were recovered including one whiteware and ten terracotta sherds. Five glass and nine metal artifacts were recovered within the site. Seven of the artifacts were diagnostic, including an enamelware bowl of blue and white speckled ware (Figure 6) dating between 1889 and the 1930s. Enamelware began to lose popularity in the 1930s as cheaper alternatives like Pyrex were developed (Old and

Interesting 2012). The other diagnostic historic artifacts collected from site 12NO298 included whiteware (1820 to present); amber glass (1860 to present), aqua glass (1800s to 1910s), clear glass (1875 to present), and square cut nails (1830s to present) (IMACS 1992:470(5),472(18-19); ODOT 1991:177; Trussel 2010:3, 13).

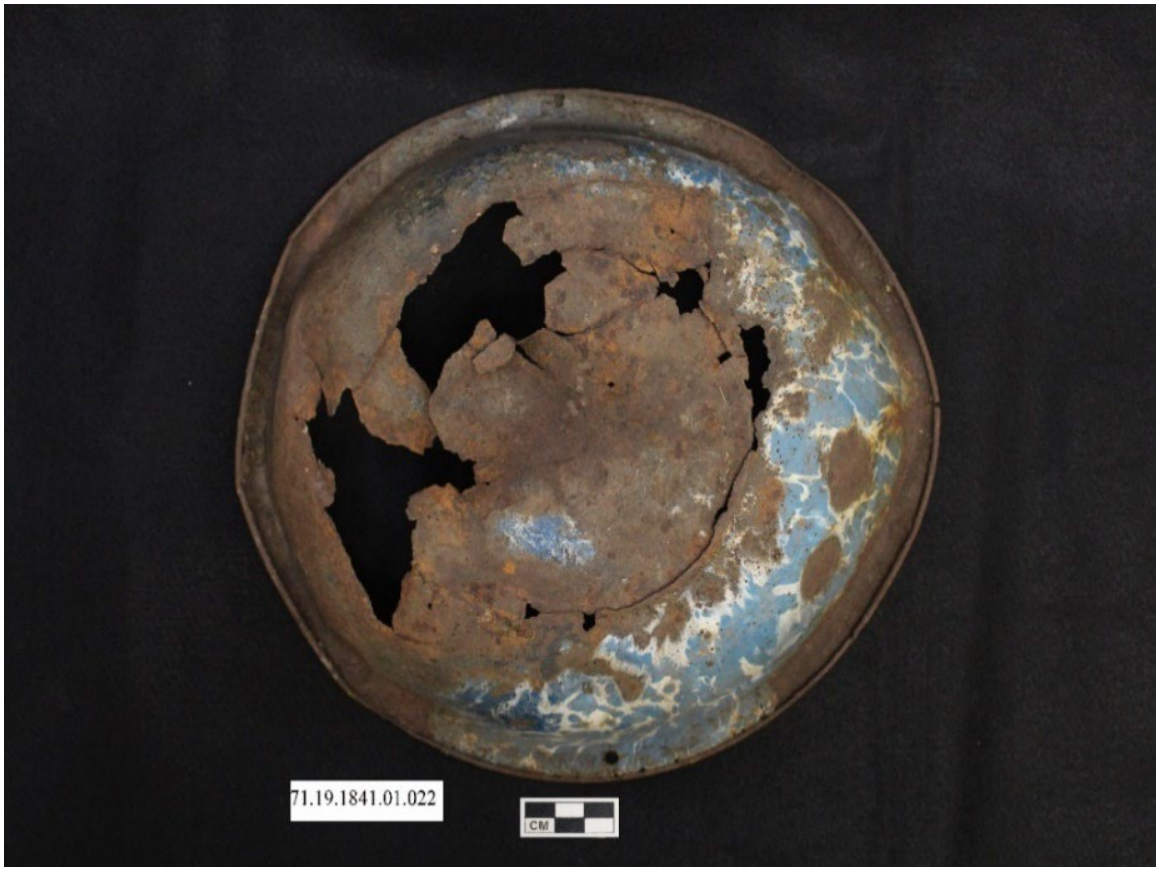

Figure 6. An enamelware bowl dating between 1889 and the 1930s found at site 12NO298 (Photo by Zoe Lawton, Ball State University).

Two features were identified within site 12NO298. Feature T3-F1 was a series of three concrete foundation fragments with large cobble inclusions that had been moved to a secondary location. Additionally, feature T6-F1 was a partially buried steel beam about 30 m north of T3-F1. Both features are located in an area with a concentration of STPs that yielded historic artifacts surrounding the area that was previously surveyed by Arnold and Graham (2013).

Although we did not find explicit evidence of the village, our findings from 12NO298 and five other smaller sites within SA2 support the presence of American Indian groups on the upland landform. These artifacts include an unhafted biface made of Silurian chert, a utilized medial flake made of unidentified chert (Figure 7), a distal flake made of a Silurian chert consistent with Liston Creek chert, two hammerstones (Figure 8), and a complete flake made of a Silurian chert consistent with Kenneth chert. None of these artifacts are diagnostic of a particular time period but are relevant in establishing the presence of American Indian groups on the landscape.

Figure 7. Utilized medial flake made from an unidentified chert found in site 12NO320 (Photo by Zoe Lawton, Ball State University).

Archaeological investigation at 12NO298 has the potential to contribute valuable new information about the American Indians of the area, early settlers, and their interactions, and additional fieldwork is recommended. The data generated by such investigations could inform future cultural and natural resource management plans for COLSP and potentially be useful in developing locally grounded historical interpretation for the general public. Therefore, we concur with prior recommendations (Arnold and Graham 2013) that site 12NO298 is potentially eligible for the NRHP under Criteria A and D (36 CFR § 60.4[a, d]). Site 12NO298 is also recommended to be potentially eligible for inclusion to the IRHSS.

In addition to site 12NO298, seven other sites were encountered in SA2. Because of the small number of artifacts found within site 12NO323 and the lack of temporally diagnostic artifacts, further investigation is needed to determine whether or not site 12NO323 is considered potentially eligible for inclusion to the NRHP and the IRHSS. The remaining sites (12NO319, 12NO320, 12NO321, 12NO322, 12NO324, and 12NO325) are not considered eligible for inclusion on the NRHP (36 CFR § 60.4[a-d]) or the IRHSS. No further work is recommended for these sites.

Figure 8. Hammerstone discovered at site 12NO323 (Photo by Zoe Lawton, Ball State University).

DISCUSSION AND CONCLUSION

The investigation of Mulberry Schoolhouse and the presumed contact-era American Indian village, along with the addition of new and reinvestigated sites to SHAARD, fulfill our projects goals. The two reinvestigated sites (12NO310 and 12NO298) have additional research potential and are recommended for additional study. Project results included further documentation of the historic and contact-era cultural resources within COLSP, filling in gaps left by previous research, and data for COLSP to use in future interpretation and resource management planning. In addition, seven new sites and two reinvestigated sites were recorded in SHAARD.

Results from the reinvestigation of site 12NO310 revealed history about the Mulberry Schoolhouse and historic schools in the area in general. The three features discovered were parts of the school foundation and structure as well as a possible privy. The geophysical survey successfully provided evidence of the buried structures and a rough shape of the outline of what was once the Mulberry Schoolhouse. A total of 236 artifacts recovered from the site were consistent with interpretations of the site as a school, including the decorative school desk leg. Other artifacts such as ceramics, glass, and square cut nails were also relevant to the time period and the use of the site.

The reinvestigation of site 12NO298 did not lead to any definitive evidence of the American Indian village, although the artifacts recovered from this site as well as other smaller sites support Indigenous presence. Because none of the precontact artifacts were diagnostic to a particular time period, it is difficult to tell if these were used by precontact or contact-era peoples. Evidence of Euro-American occupation and use of the land during the nineteenth and twentieth centuries was also found at the sites in SA2. However, it is also possible that some of the artifacts labeled as historic with an assumed Euro-American context could have been used by the Native inhabitants of the village as these items were also used by American Indians (Panich and Schneider 2019; see also Schneider and Panich (eds) 2022 chapters and references therein).

It is increasingly being recognized that the standards for description of sites and artifacts in traditional archaeological recording results in a “Categorical Denial” of the presence of American Indians after the initiation of colonization (Panich and Schneider 2019). Arnold and Graham (2013) conclude that finding nineteenth century artifacts and stone tools represent “Prehistoric” Indigenous activity followed by later “Historic” Euro-American activity. The fact is, there was substantial overlap between the material culture of Indigenous and settler populations during the eighteenth and nineteenth century. In fact, Goodspeed and Blanchard (1882:267-268) relate a story of Mr. Bowen missing a chance to have a fresh turkey for breakfast one morning after an Indian snuck in and shot the turkey with a rifle, prolonging Mr. Bowen’s search for breakfast. While a somewhat amusing story of unknown validity, it places Natives and settlers in the same time and space with overlapping material culture.

The diagnostic date ranges of the historic artifacts recovered from 12NO298 span a broad range. While it cannot be definitively concluded that these artifacts were used by Indigenous inhabitants, their date ranges overlap the village's occupation dates, making it possible that they were incorporated into daily Native life. Yet, in Arnold and Graham’s report, every instance of glass, whiteware, metal, etc. not modified into a secondary “native” style object is identified as being of European ethnic affiliation. The confusion over whether or not the American Indian village could be in the reported location with the combination of materials found is a prime example of the titular “Indigenous Erasure” of Panich and Schneider’s influential 2019 paper. Simply, there is no contradiction between the presence of stone manufactured artifacts coexisting with nineteenth century materials of European manufacture. The location of manufacture does not limit the identity of the owner of the material. It is very clear that there was Indigenous presence on the terrace and slopes within SA2, and that there are nineteenth century artifacts present. The presence of stone artifacts does not conclusively demonstrate that this is a Myaamia village site, nor does the presence of European derived materials exclude Indigenous presence. However, due to the wide-ranging dates and the complexities of artifact attribution, we are unable to determine whether the historic artifacts recovered from 12NO298 were actively utilized by American Indian occupants. Acknowledging this artificial disjuncture introduced by the archaeological systematics employed, and bringing together the historical records with the combined results of our survey and the previous, we can say that SA2 may in fact be the location of a nineteenth century American Indian village. Additional investigation, in collaboration with the likely descendant communities is required to reveal the full history of the Indigenous use of this landform, before, during, and after invasion by Euro-American settlers.

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ARCHAEOLOGICAL SURVEY OF LOBLOLLY MARSH NATURE PRESERVE AND LIMBERLOST SWAMP CONSERVATION AREA, JAY COUNTY, INDIANA

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INTRODUCTION

Funded by a FY21 Historic Preservation Fund (HPF) grant administered by the Indiana Division of Historic Preservation and Archaeology (DHPA), a total of 91.58 acres (ac) (37.15 hectares [ha]) of Loblolly Marsh Nature Preserve (LMNP) and Limberlost Swamp Conservation Area (LSCA) in Jay County, Indiana, was surveyed by the Applied Anthropology Laboratories (AAL) in 2021 and 2022. The survey methods included Phase Ia shovel test probes and pedestrian survey. Our primary research objective was to understand the use of Pleistocene marshland by precontact Indigenous populations. The project goals were to identify new archaeological evidence for the historic town of White Oak, refine the cultural chronology for Jay County, and provide the results to the Indiana Department of Natural Resources (IDNR), Division of Nature Preserves (DNP) to support future resource management planning. Our results add to our understanding of the use of Pleistocene marshland by precontact Indigenous populations and archaeological evidence White Oak within LMNP and LSCA, and provide the DNP with information to facilitate management planning and historical interpretation. Our four survey areas included 41.07 ac (16.62 ha) around the White Oak Cemetery (WOC) within LSCA and 50.51 ac (20.44 ha) within LMNP. We defined 16 new archaeological sites (12JA709 through 12JA724), yielding new documentation of both Euro-American and Indigenous components. In total, we recovered 866 historic artifacts and 19 precontact artifacts and documented 12 features. Here we highlight key survey results regarding historic town of White Oak (12JA711, 12JA724, and 12JA712) and Indigenous use of Pleistocene marshland (12JA716) within LMNP and LSCA.

HISTORY OF LOBLOLLY MARSH NATURE PRESERVE AND LIMBERLOST SWAMP CONSERVATION AREA

Modern Indiana was formed by repeated glacial and inter-glacial stages, starting some 2.6 million years ago at the beginning of the Pleistocene (Fullerton 1986; Shurig 1970). These glacial events transported tons of glacial drift that in turn shaped the surface of Indiana. The most recent glaciation, the Wisconsin Stage, began encroaching from the northeast into Indiana approximately 90,0000 years ago (Wayne 1966). All survey areas are within the Wisconsin glaciation. As glaciers began receding, they left behind ground and ridge moraines. Both the Mississinewa and Salamonie Moraines are located in Jay County (Chaturvedi 1991:24). The Wabash and Fort Wayne Moraines are located in nearby Adams County (Chaturvedi 1989:25). Aside from these moraines, the topography of the region is dominantly nearly flat to rolling till plain of low relief (Schneider 1966:49-50). As the glaciers retreated from Jay and Adams counties 12,000 to 15,000 years ago, glacial melt water deposited the parent material of most of the soil within the counties. This material was then reworked and redeposited by wind and water. While most of the parent material is comprised of glacial material, their properties vary based on how they were deposited (Farmer and Ziegler 1986:53; Kluess 1986:53). A majority of the soil surrounding the survey areas formed in depressions on lake, till, outwash, and flood plains. The soil is predominantly clay-rich and fine textured (Kluess 1986:53; USDA/NRCS 2015). This, in conjunction with the nearly level topography, resulted in much of the area being poorly drained (Homoya et al. 1985:225). This lack of drainage, topographic lows, and abundant precipitation facilitated the formation of extensive wetlands in precontact Jay and Adams counties. These geological factors slowed precipitation runoff, and concentrated surface water into wetlands. Regional and local groundwater flow helped maintain these wetlands (Fretwell et al. 1996:187).

The land that is part of present-day LMNP and LSCA was in the homelands of the Myaamia (Miami) people. The Delaware, Potawatomi, Shawnee, Wyandotte, and Ottawa also lived near what is now Adams and Jay counties before removal. This land was ceded to the U.S. as part of the Treaty of St. Mary's in 1818 (Kappler 1904; Olson 2020:3; United States Government 1818). The first permanent Euro-American settlers arrived in what was to become

Jay County in 1821 (Henning 1985:xv). The county was established by the Indiana General Assembly in 1825, with Jackson Township, the location of LMNP and WOC, established in 1838 (Jay 1922:107). The dense forests and wetlands and lack of roads impeded the county's early growth. In 1876, the discovery of the Trenton Field in nearby Delaware County began the east-central Indiana natural gas and oil boom (Rupp 2021). The construction of a railroad in 1879 and discovery of natural gas in Jay County in 1886 led to population growth (Henning 1985:xvi). At one point, Jackson Township "was counted one of the best gas producing townships in the State" (Blatchley 1902:149). The resultant thousands of gas wells depleted resources, ending the boom in the early 1900s (Rupp 2021). Bryant, the closest community to LMNP, "reached the height of development as an oil-boom town in the early twentieth century." (Henning 1985:xvi).

The lands that make up LMNP and LSCA were part of wooded Limberlost Swamp, originally encompassing 13,000-acres within Adams and Jay counties but destroyed between the late 1800s and the early 1910s. The swamp was depleted through a combination of logging, drilling wells for oil and gas, and using clay tile pipes (Figure 1) to drain water to create tillable farmland (Aalto 2020; Sanders 2015). In 1889, famed novelist and naturalist Gene Stratton-Porter moved to Geneva, along the northern border of the swamp, and became interested in the area's natural beauty (Eldridge and Carlson 1996). She wrote several novels while in Geneva, as well as nature studies about life in Limberlost Swamp (Indiana Department of Natural Resources Division of Nature Preserves 2021). Restoration of the swamp was driven by environmental and preservation interests, as well as alternative uses for frequently flooded farmland. Restoration began in the early 1990s with state purchase of farmland, and subsequent levee construction and removal of artificial drainage (drainage tiles) (Virginia B. Ball Center for Creative Inquiry 2012). These restorative management practices brought water back into the area as well as native plants and animals that would have been present prior to the swamp's destruction (Aalto 2020).

LMNP now encompasses ~440 ac (178 ha) of restored wetlands and forests within the LCSA. The LCSA parcel of land surrounding WOC was acquired by the State of Indiana in 2016. The LSCA consists of 922 ac (373 ha) in Jay and Adams counties, Indiana (Figure 2). Because LSCA is in both Adams and Jay counties, we refer to both counties in our background research.

Figure 1. Clay tile, within site 12JA713 (photo taken by Hannah Ryker, Ball State University).

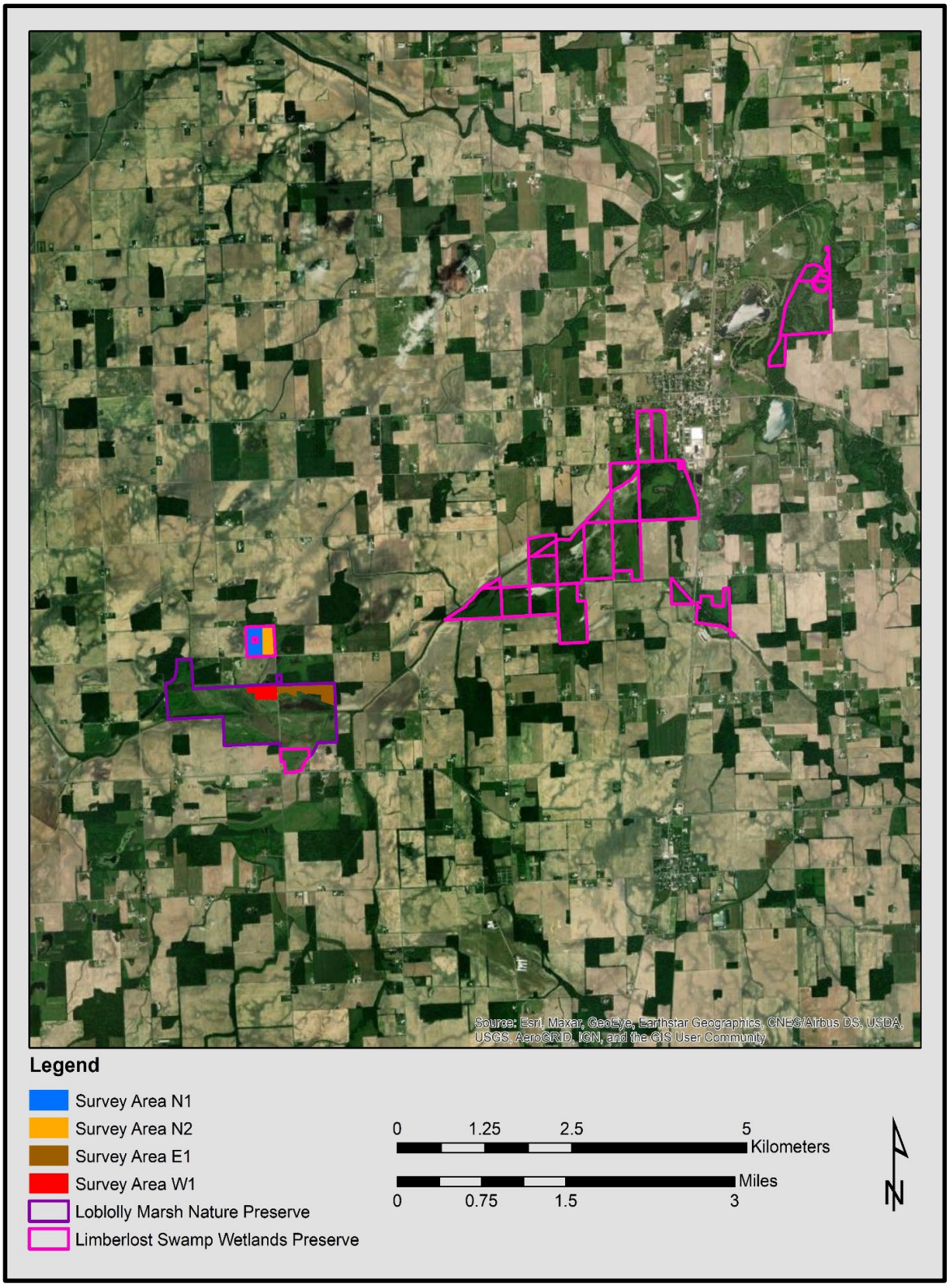

Figure 2. Location of LMNP and LCSA (also known as Limberlost Swamp Wetlands Preserve) and four survey areas over aerial imagery (Esri 2022).

HISTORIC WHITE OAK AND ARCHAEOLOGICAL SITES 12JA711, 12JA712, AND 12JA724

White Oak was a small hamlet in northern Jackson Township with a grocery store, post office, school, church, and cemetery (Figure 3, Figure 4, Figure 5) (Griffing, Gordon & Co. 1887; United States Post Office Department [USPOD] 1910; Wepler et al. 1982:93-94). The cemetery was active between 1850 and 1910 (Henning 1985:7). Lemuel Engle, a member of the Society of Friends, purchased two land patents in 1840, and by 1887, much of the area surrounding WOC was owned by members of the Engle family (See Figure 3; Ancestry.com 2014; Bureau of Land Management 1840a, 1840b; Griffing, Gordon & Co. 1887). An Orthodox Quaker church was built at White Oak in 1892 (Edmundson 2003:39). Based on historical maps, as well as artifacts and features found during this survey, there were likely two different church locations.

In the 1887 map (Figure 3) the school house is shown with the road (CR W 850 N) turning north (not continuing east as 850 N does currently) then bending east to pass just south of the cemetery and then rejoins N 250 W after crossing the tributary stream on the edge of a low elevated ridge. The church, built in 1892, is not shown in the 1887 map. By 1901 (see Figure 4), 850 N is straightened to align with its current path, likely indicating simplification of the transportation infrastructure after successful drainage of the lower areas which are still marked as marshy on the 1962 USGS 7.5' topographic quadrangle. Figure 4 shows the church on the border of 850 N in the eastern corner of the N1 parcel. This contrasts with the 1910 Rural Delivery Map (Figure 5) which shows the church not adjacent to the current path of 850 N and further to the east in the N2 parcel close to the place where the earlier road crossed the drainage ditch just before connecting with 250 W. The 1936 cultural map (Indiana Highway Commission 1936; see Ryker et al. 2022:Figure 62, Figure 63) shows the church in approximately the same place as the 1901 map.

Given the distribution of artifacts and the combined evidence of the historical maps and the landscape, it seems likely that the first church or gathering place may have been in parcel N2 on the elevated ridge that the county road (see Figure 3) originally followed adjacent to the cemetery and avoiding the marshy lowland. The church was likely moved after the road was rerouted to the current route of 850 N, after sufficient drainage improvements enabled use of the less well-drained areas of the property. The 1901 map is precise enough for coarse navigation, but the 1910 delivery route map shows more detail, and we reason is more precise than the 1901 map. Following this reasoning, we conclude that sites 12JA711 and 12JA724 likely are associated with the first church built in 1892 adjacent to the road mapped in 1887. The church was likely moved sometime between 1910 and the early 1930s after the county road was straightened (Indiana Highway Survey Commission 1936; USPOD 1910). Site 12JA712 is associated with the newer church, which was demolished in 1963 (Edmundson 2003:39).

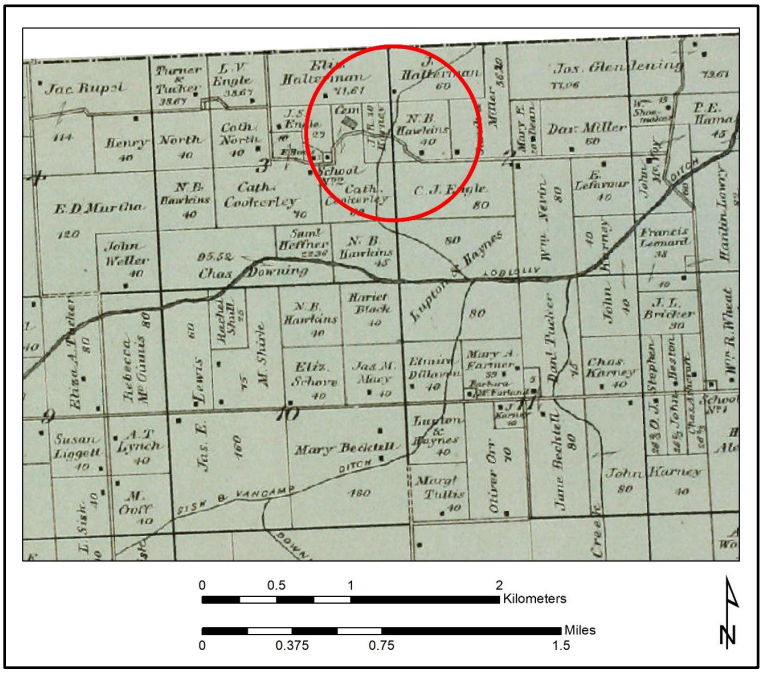

Figure 3. 1887 Atlas of Jay County (Griffing, Gordon & Co 1887) and approximate location of White Oak (red circle). Note the absence of a church building.

Figure 4. 1901 Atlas of Jay County (Kelley 1901) and approximate location of White Oak (red circle).

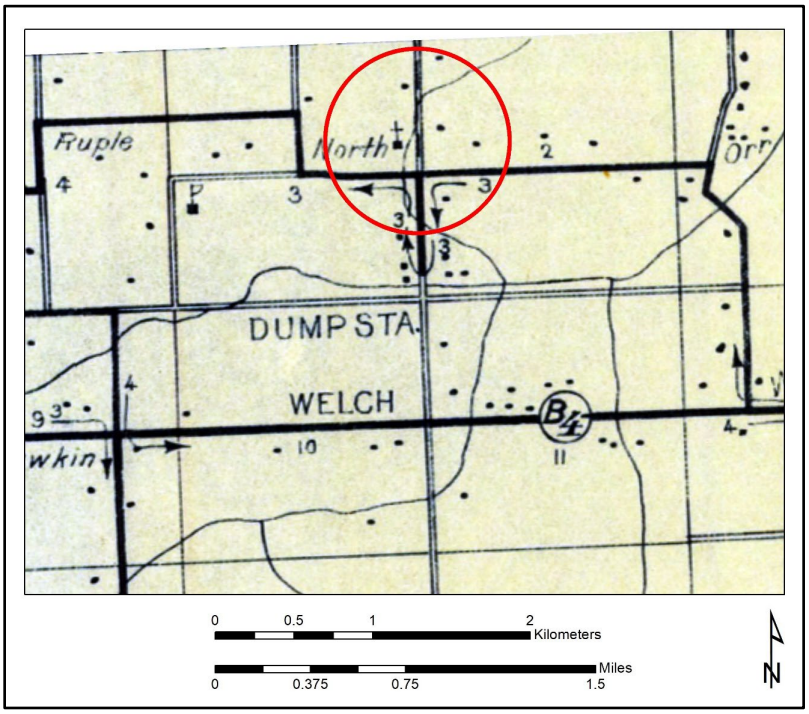

Figure 5. 1910 Jay County Rural Delivery Map (USPOD 1910) and approximate location of first White Oak church (red circle).

Site 12JA711 is classified as a Precontact Isolated Find and Historic Scatter. A total of 60 artifacts were recovered from the site, including historic ceramic, glass, and metal. The ceramic artifacts included a Parian doll leg dating from the 1850s to the 1880s (Figure 6A). Parian is fine, unglazed, un-tinted porcelain that resembles white marble (Richter 1993:15). This type of porcelain began being manufactured in the 1840s and was first introduced at the Great Exhibition of 1851 in London. Parian ware was inexpensive to produce and by the 1860s the dolls featured elaborate hairstyles, painted faces, and detailed dresses. They were often exported to the United States (Krombholz 2006:7-21). Around 1880, the popularity of the Parian doll began to wane as tinted bisque (usually colored pink to look more like skin) became more popular. The diagnostic artifacts from the site date primarily from the nineteenth century to the 1920s, fitting with the time period the first church was operating.

Site 12JA724 is classified as a Precontact Isolated Find and Historic Scatter and measures 0.76 ac (0.31 ha) in size. A total of 56 artifacts were collected including historic ceramic, glass, and metal. One of the ceramic artifacts recovered was a piece of ironstone with a partial maker's mark of English company Alfred Meakin (Ltd) (Figure 6B). The artifact dates from the years the company operated: 1875 to 1974 (Gibson 2016:106). Alfred Meakin manufactured ironstone china and white granite ware for export to the Americas and sold their goods for export through mail order catalogs (Birks 2022). The terminal dates of the diagnostic artifacts from site 12JA724 primarily range from the 1900s to the 1930s, fitting in with the active dates of the first church.

Site 12JA712 is classified as a Historic Scatter and includes both historic artifacts and features, including glass, ceramic, charcoal, and concrete. The diagnostic artifacts found at the site all have end dates between 1920 and the 1970s, fitting the time period the second church was active. One of the diagnostic artifacts was an amber glass bottle base with an E.L. & Co. basemark, originally produced for Eli Lilly and Company products (Figure 6C). Eli Lilly and Company is a pharmaceutical company started in 1876 and based in Indianapolis, Indiana. The majority of the company's medicine bottles were produced by the Fairmount Glass Company from 1890 to 1930 in Fairmount and later Indianapolis (Whitten 2022). Another artifact recovered was a glass syringe plunger (1850s to the 1950s) (Figure 6D). The first hypodermic needle was most likely made by Francis Rynd in 1844. In 1853, Alexander Wood combined a syringe with a hypodermic needle. This type of syringe has three elements including a barrel, plunger and piston. This basic design was used until the mid-1950s (Craig 2018). An interesting aspect of this site are the two medical artifacts found (an Eli Lilly bottle and syringe), possibly indicating that the church could have been used as some type of temporary health facility at some time during its existence.

Five features were identified within site 12JA712, including a debris pile, a broken concrete slab, and cut stones scattered around the site. These features are likely the remains of the Quaker meeting house that is depicted as being in the general vicinity of these features on the 1901 Atlas and the 1910 rural delivery map of Jay County (Figure 4 and Figure 5), and referenced as White Oak Church on current topographic maps. Site 12JA712 is heavily disturbed by an access road and the intentional demolition of the structure (as evidenced by the debris pile). Historic and archaeological evidence suggests that this site is the remnants of the White Oak Quaker church that was built between 1910 and the early 1930s, and demolished in 1963 (Edmundson 2003:29). Due to the level of disturbance of the site and lack of intact primary features, site 12JA712 is not eligible for inclusion to the National Register of Historic Places (NRHP) based upon the criteria for evaluation (36 CFR § 60.4[a-d]) (Ryker et al. 2020:105).

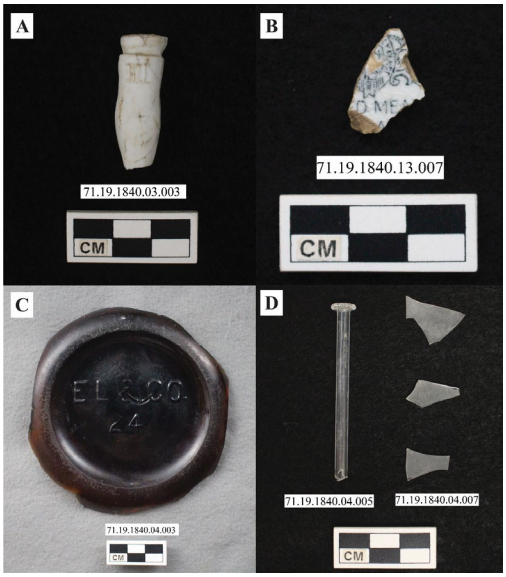

Figure 6. A) Partial Parian porcelain doll leg found at site 12JA711; B) Ironstone sherd with partial maker's mark from Alfred Meakin, found at site 12JA724; C) Amber glass vessel base produced by the Fairmont Glass Company for Eli Lilly & Company, found at site 12JA712; D) Glass syringe plunger (left) collected from 12JA712 (Photos by Zoe Lawton, Ball State University).

PRECONTACT USE OF PLEISTOCENE MARSHLAND AND ARCHAEOLOGICAL SITE 12JA716

In a landscape characterized by poor drainage and extensive wetlands, seasonal and annual precipitation fluctuations could have changed the size and location of habitable areas in and around wetlands (see e.g., Surface-Evans et al. 2005). Examination of the previously recorded sites surrounding the survey areas appears to support this, as most sites are located on upland landforms, similar to patterns noted in other Hoosier wetland areas, such as the Kankakee marsh in northwestern Indiana (Cremin 1991; Macleod et al. 2015; Mangold 1981; Purtill et al. 2021; Schurr 2003; Surface-Evans 2015; White 2007). The prevalence of sites located on upland landforms demonstrates the importance of microtopography in lowland areas that commonly flooded. The rich diversity of resources that existed within the wetlands would have provided a hospitable, yet unpredictable, environment to precontact communities as it offered inhabitants a wide variety of natural resources available as food, water, and raw material sources for the production of tools, clothing, adornment and shelter.

During the current survey, one diagnostic precontact artifact was identified. Archaeological site 12JA716 consisted of three flakes made of two different types of Ohio Flint Ridge (Vanport) chert, all found in the same shovel test on the edge of a terrace. Two flakes refit as a complete heat-treated Hopewell bladelet, diagnostic of the Middle Woodland period (Figure 7) (Greber et al. 1981; Nolan et al. 2007; Pi-Sunyer 1965). The other artifact is a proximal flake from an unidentified period.

Figure 7. A Hopewell bladelet discovered within site 12JA716 (Photo by Zoe Lawton, Ball State University).

The Middle Woodland period saw the rise of the Hopewell culture and extensive trade networks (Mangold 2009; Seeman 1979). Classic Hopewell mound sites and earthwork centers are better known in the Scioto and Miami valleys of Ohio, and the Illinois River Valley, but there are similar sites in east-central Indiana (McCord and Cochran 2008). There are only six reported mound or earthwork sites in Jay County (McCord and Cochran 2015:A171-173), and there are only three Woodland sites, one Terminal Middle Woodland site, and eight Late Woodland sites in the vicinity of our survey areas. Middle Woodland period (ca. 200 BC-600 AD) subsistence and settlement patterns are generally a continuation of trends from the Early Woodland period within Indiana. Middle Woodland settlement patterns vary by region, but components tend to be located in close proximity to water (ponds, swamps, and drainage ways), and are relatively equally distributed across the landscape (Montet-White 1968:18-19). In the Kankakee marsh region, Middle Woodland people were utilizing marsh and wetland resources, but less than the succeeding Late

Woodland and Late Precontact groups (Balough et al. 2017; Surface-Evans 2015; Purtill et al. 2021; White 2007). In other areas of east central Indiana, Burkett and Hicks (1986) have suggested that Middle Woodland sites are typically found on elevated terrace, bluff, and moraine landforms, while McCord and Cochran (1996) note that Early and Middle Woodland lithics artifacts have been found primarily in river valleys.

Ohio Hopewell bladelets are most often made from Ohio Vanport (Flint Ridge) chert and are narrower than those associated with Illinois Havanna Hopewell (Greber et al. 1981; Miller 2018; Nolan 2020; Nolan et al. 2007; Pi-Sunyer 1965; Ruby 1997). The bladelet recovered from 12JA716 fits well with the Ohio Hopewell bladelets. The nature of Hopewell utilization of this area remains unknown. With the lack of extensive debris found within site 12JA716, we cannot say whether or not sedentary (residentially stable) families lived near the marsh, but we can say that at least one person aware of Scioto Hopewell traditions and materials stopped on this terrace overlooking the marsh.

Due to the lack of sites in Jackson Township, Jay County, and adjacent Hartford Township, Adams County, the use of this area during the Middle Woodland period is very poorly understood. Therefore, site 12JA716 begins to fill a gap in the data for the area. Specifically, it demonstrates that Middle Woodland people were interacting with wetlands, in at least this instance some activity on the terrace above the lowland marsh. Additionally, the presence of two different varieties of Vanport (a.k.a. Ohio Flint Ridge) chert and one in the form of an Ohio Hopewell bladelet indicates there were connections of some kind between the Scioto Hopewell heartland. It is unclear whether Middle Woodland settlement and activity patterns around LMNP follow patterns noted by previous investigators for Middle Woodland populations in east central Indiana. Burkett and Hicks (1986) hypothesized a preference for elevated landforms while McCord and Cochran (1996) hypothesized more intensively utilized bottomlands. Whether groups around LMNP followed one of these patterns or some other combination is unknown.

Site 12JA716 is recorded as a Prehistoric Lithic Scatter and illustrates a potential to fill a gap in regional data. It is therefore considered to possess information potential (*sensu* Nolan 2020) and is recommended potentially eligible for inclusion to the NRHP based upon the Criterion D (36 CFR § 60.4[d]). It is also potentially eligible for the Indiana Register of Historic Sites and Structures. Additional archaeological investigation is recommended for site 12JA716.

DISCUSSION AND CONCLUSION

Sites 12JA711, 12JA712, and 12JA724 appear to be the remnants of two Quaker churches that served the White Oak community. These sites give us a better understanding of pre-LMNP land use during the nineteenth and twentieth centuries after the Limberlost Swamp had been drained. They also strengthen archeological evidence of the community of White Oak. With these results, we have added details to the growth of the White Oak Friends community, and particularly learned about the nature and distribution of community gatherings in relation to each iteration of the church structure. Importantly, we confirmed that the variously mapped locations of the church in different sources actually represent two distinct iterations of the meeting house. The abundance of decorated ceramics and glass, and the diversity of materials, including part of a porcelain doll, speak to the diversity of social and spiritual activities these structures supported at different points in the history of the Society of Friends at White Oak.

Site 12JA716 is recorded as Precontact Scatter and contained two heat treated flakes refit to a Hopewell bladelet, diagnostic to the Middle Woodland period. Examination of previously recorded sites in the area indicated a gap in regard to Middle Woodland settlements, resulting in a poor understanding of how the land was used during that period. Site 12JA716 begins to fill in this gap, and further refines the cultural chronology of Jay County. Additionally, it indicates that Middle Woodland people were interacting with this wetland and aides our understanding of precontact use of Pleistocene marshland in Jay County. Further archeological investigation of this site has the potential to uncover new information on Middle Woodland occupation of LMNP. Additional research could inform future natural and cultural resource management plans for LMNP and LSCA, and contribute to our knowledge about Pleistocene marshland use by precontact populations.

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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 site also provides opportunities to access definitions and additional information regarding archaeological terms and concepts:

archaeological.org/education/glossary

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, composed 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: around 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.