PHASE I

ARCHAEOLOGICAL SURVEY FOR PROPOSED IMPROVEMENTS AND BRIDGE REPLACEMENT ALONG BR 549 OVER PLEASANT RUN, LOGAN COUNTY, KENTUCKY

(KYTC ITEM # 3-1073.00)

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Kentucky Office of State Archaeology Project Number: *FY15-8283*

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Abstract

At the request of the Kentucky Transportation Cabinet (KYTC), archaeologists from CDM Smith conducted a Phase I archaeological survey for the proposed improvements and bridge replacement along BR 549 over Pleasant Run, mile points 3.00 – 3.60, in Logan County, Kentucky (KYTC Item Number 3-1073.00). The area of potential effect (APE) consisted of 0.27 acres (0.109 ha). The APE was visited by a CDM Smith archaeology crew on the 25th of November, 2014. The archaeological survey involved systematic shovel probe excavation, bucket auguring, and visual inspection within the project's entire APE.

The survey resulted in a single archaeological site within the APE, site 15LO267. Site 15LO267 consists of moderate-density, non-diagnostic prehistoric lithic scatter. An assemblage of 97 prehistoric artifacts were recovered during the survey, consisting of mostly debitage, one projectile point tip, a retouched biface, a utilized flake, a retouched core, and a core. No cultural or temporal affiliation was determined from the material. All artifacts were recovered from either the surface or within the plowzone context. No subsurface features were identified through shovel probing and augering of the site.

The limited range of artifact types, the low number of artifacts recovered, plus the lack of intact subsurface features, or artifact middens indicate that the site has limited research potential. Therefore, the surveyed portion of Site 15LO267 is not recommended as eligible for the NRHP, according to Criteria A, B, C, or D. The site likely continues in all directions across the floodplain and possibly onto the terrace south of the APE.

No further archaeological work is recommended for the portion of the site within the APE.

Table of Contents

Abstract i
Table of Contents ii
List of Figures iv
List of Tables iv
Acknowledgements vi
Section 1 - Introduction 1-1
1.1 Project Sponsor and Regulatory Authority 1-1
1.2 Purpose and Scope of Work 1-1
1.3 Project Location and Description 1-1
1.4 Area of Potential Effect (APE) 1-1
1.5 OSA Records Research 1-1
1.6 Principal Investigator 1-5
1.7 Field and Laboratory Crew 1-5
1.7.1 Field Effort 1-5
1.7.2 Laboratory Effort 1-5
1.8 Maps and Figures 1-5
1.9 Curation 1-5
1.10 Summary of Investigations 1-5
Section 2 - Environmental 2-1
2.1 Physiography and Topography 2-1
2.2 Geology 2-1
2.3 Hydrology 2-4
2.4 Soils 2-7
2.5 Cherts 2-7
2.6 Prehistoric Climate Conditions 2-7
2.7 Current Climate Conditions 2-10
2.8 Prehistoric and Present Flora and Fauna 2-10
2.9 Current Land Use 2-10
Section 3 – Cultural Context, Previous Investigation, and Summary of Known Sites 3-1
3.1 Prehistoric Period 3-1
3.1.1 Paleoindian Period 3-1
3.1.1.1 The Early Paleoindian: Pre-Clovis 3-2
3.1.1.2 The Early Paleoindian: Clovis 3-3
3.1.1.3 The Middle Paleoindian 3-4
3.1.1.4 The Late Paleoindian 3-4
3.1.2 Archaic Period 3-5
3.1.2.1 The Early Archaic Period 3-6
3.1.2.2 The Middle Archaic Period 3-6
3.1.2.3 The Late Archaic Period 3-8
3.1.3 Woodland Period 3-9
3.1.3.1 Early Woodland 3-10
3.1.3.2 Middle Woodland 3-11
3.1.3.3 Late Woodland 3-12
3.1.4 Late Prehistoric Period 3-15

3.2 Historic Period 3-17
3.2.1 Exploration and Early Settlement (ca. 17th Century-1820) 3-17
3.2.2 Antebellum (1820-1861) 3-23
3.2.3 Civil War (1861-1865) 3-27
3.2.4 Postbellum Industrialization (1865-1914) 3-28
3.2.5 Twentieth Century 3-29
3.3 Historic Map and Aerial Photography Research 3-30
3.4 Previous Archaeological Research 3-30
3.5 Known Archaeological Sites 3-32

Section 4 - Methodology 4-1
4.1 Implemented Field Methods 4-1
4.1.1 Field Conditions 4-1
4.1.2 Evaluation of Field Methods Used 4-1
4.2 National Register Evaluation of Archaeological Sites 4-6

Section 5 - Materials Recovered 5-1
5.1 Laboratory Methods 5-1
5.1.1 Prehistoric Artifact Assemblages 5-1
5.1.1.1 Prehistoric Lithics 5-1
5.1.1.1.1 Lithic Debitage 5-1
5.1.1.1.2 Cores 5-3
5.1.1.1.3 Bifaces 5-3
5.1.1.1.4 Unifacial Tools 5-3
5.1.1.1.5 Retouched Flakes 5-3
5.1.1.1.6 Raw Material Analysis 5-4
5.1.1.1.7 Mass Analysis 5-4
5.1.1.1.8 Materials Recovered 5-5

Section 6 - Results 6-1
6.1 Site 15LO267 6-1
6.1.1 Location 6-1
6.1.2 Site Description 6-1
6.1.3 Stratigraphy 6-1
6.1.3.1 STP 5 6-8
6.1.4 Features 6-8
6.1.5 Materials Recovered 6-8
6.1.5.1 Prehistoric Artifacts 6-8
6.1.6 Discussion 6-9
6.1.6.1 Interpretation 6-9
6.1.7 National Register Eligibility 6-9
6.1.8 Recommendations 6-9
6.2 Summary 6-10

Section 7 - Recommendations and Summary 7-1
Recommendations 7-1
7.1 Site 15LO267 7-1
7.1.1 National Register Eligibility 7-1
7.1.2 Recommendations 7-1
7.2 Summary 7-1

Section 8 - References 8-1

Appendix A - Artifact Inventory **A-1**
Appendix B - Archaeological Site Forms **B-1**

List of Figures

Figure 1-1. Project Location within Logan County. 1-2
Figure 1-2. USGS Topographical Map showing Project Location. 1-3
Figure 1-3. Aerial Map showing Project Location. 1-4
Figure 2-1. Physiographic Map of Kentucky. 2-2
Figure 2-2. Geologic Map of Kentucky. 2-3
Figure 2-3. Geology of the Project Area. 2-5
Figure 2-4. Hydrology of the Project Area. 2-6
Figure 2-5. Soils in the Project Area. 2-8
Figure 2-6. Creek Bed and Scrub and Brush Area inside the Project Area, Looking North-northeast. 2-11
Figure 2-7. Agricultural Area inside the Project Area, Looking East-southeast. 2-11
Figure 3-1. Green River Country (Aron 1996). 3-18
Figure 3-2. 1812 Map of Kentucky (Melish 1812). 3-21
Figure 3-3. Kentucky in 1796 (Barker 1796). 3-22
Figure 3-4. 1836 Map of Kentucky (Tanner 1836). 3-27
Figure 3-5. Logan County in 1863 (Swann 1863). 3-28
Figure 3-6. Locations of Previous Archaeological Investigations. 3-31
Figure 4-1. Location of STPs and Augers on USGS Topographical Map. 4-2
Figure 4-2. Location of STPs and Augers on Aerial Photograph. 4-3
Figure 4-3. View of General Project Area: South Side of BR 549, Cultivated Field and Road Construction Berm, Looking Northwest. 4-4
Figure 4-4. View of General Project Area: North Side of BR 549, Road/Culvert/Bridge Construction Disturbance, Looking Northwest. 4-4
Figure 4-5. View of General Project Area: North Side of BR 549, Pasture, Looking Southeast. 4-5
Figure 4-6. View of General Project Area: South Side of BR 549, Cultivated Field with High Visibility, Looking Northwest. 4-5
Figure 4-7. View of General Project Area: South Side of BR 549, Fallow Field, Looking Southeast. 4-6
Figure 5-1. Tools from Site 15LO267: A) Core; B) Utilized Flake; C) Biface; D) Projectile Point Tip Fragment; E) Retouched Core (from bottom left to bottom right). 5-6
Figure 6-1. Location of Newly Recorded Archaeological Site on USGS Topography Map. 6-2
Figure 6-2. Location of Newly Recorded Archaeological Site on Aerial Photograph. 6-3
Figure 6-3. Location of Archaeological Site 15LO267 on USGS Topography Map. 6-4
Figure 6-4. Location of Archaeological Site 15LO267 on 2010 Aerial Photograph. 6-5
Figure 6-5. Location of Archaeological Site 15LO267 on Design Sheet. 6-6
Figure 6-6. Site 15LO267, High Surface Visibility Area, South Side of BR 549, Cultivated Field, Looking Northwest. 6-7
Figure 6-7. Site 15LO267, Pasture Area, North Side of BR 549, Looking Southeast. 6-7
Figure 6-8. Shovel Test Probe Profile from Site 15LO267. 6-8

List of Tables

Table 3-1. Population changes for Logan County, Kentucky (USCB 2014). 3-30
Table 5-1. Prehistoric Artifacts. 5-5

Table 5-2. Prehistoric Raw Material. 5-6
Table 6-1. Site 15LO267 Prehistoric Artifacts. 6-9
Table A-1. Prehistoric Artifact Catalog. A-2

Acknowledgements

The Principal Investigator for the archaeological survey was Mr. J. Howard Beverly, Jr., RPA. Dona R. Daugherty served as the Field Director and was assisted in the field by Ann Wilkinson. Howard Beverly generated maps and formatted the report. David McBride provided artifact analysis. Robert Ball provided support in Lexington.

Section 1 - Introduction

This report describes the methodologies and results of a Phase I archaeological survey conducted at the request of the Kentucky Transportation Cabinet (KYTC) by archaeologists from CDM Smith (CDMS) ahead of proposed improvements and bridge replacement along BR 549 over Pleasant Run, mile post 3.00 - 3.60, in Logan County, Kentucky (KYTC Item Number 3-1073.00). Field work was conducted on November 25th, 2014.

1.1 Project Sponsor and Regulatory Authority

The state agency sponsoring this survey is the KYTC; the lead federal agency is the Federal Highway Administration. The survey was conducted in compliance with the guidelines established by the Kentucky Heritage Council Guidelines (Sanders 2006) and the National Historic Preservation Act of 1966 (P.L. 89-655; 80 Stat. 915, 16 U.S.C. 470 et seq), the National Environmental Policy Act of 1969 (P.L. 910190; 83 Stat. 852, 42 U.S.C. 4321 et seq), Procedures of the Advisory Council on Historic Preservation (36CFR800), Executive Order 11593, and the Protection and Enhancement of the Cultural Environment (16 U.S.C. 470; supp. 1, 1971).

1.2 Purpose and Scope of Work

A Phase I archaeological survey was conducted ahead of proposed improvements and bridge replacement along BR 549 over Pleasant Run, mile points 3.00 - 3.60, in Logan County, Kentucky (KYTC Item Number 3-1073.00). The purpose of Phase I archaeological work was to identify any archaeological resources which might have existed and to record their extent, significance, and the potential impact of the proposed project on these cultural resources.

1.3 Project Location and Description

This project is located along BR 549, southeast of Russellville and east of KY 431 in Logan County, which is located in the Kentucky Department of Highways District 10 (Figure 1-1, Figure 1-2, and Figure 1-3).

1.4 Area of Potential Effect (APE)

The area of potential effect (APE) is defined as the limits of the proposed right-of-way and proposed temporary construction easement. The total area is 0.27 acres (0.109 ha).

1.5 OSA Records Research

A summary of previously recorded sites and surveys was received, by request, from the Office of State Archaeology (OSA) on December 4, 2014. On December 17, 2014, the site files and survey records at the OSA were accessed for this report research and for fieldwork preparation.

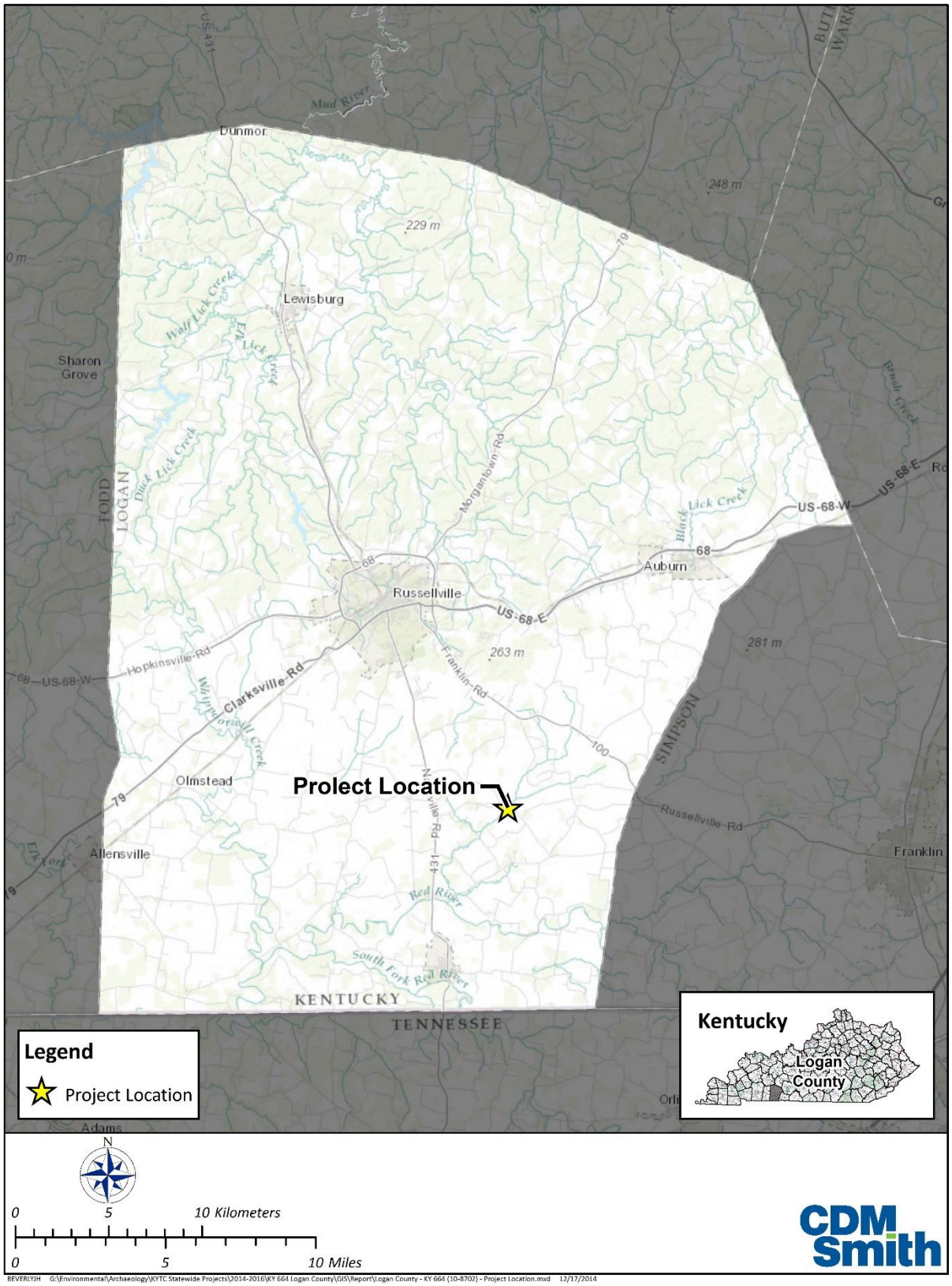

Figure 1-1. Project Location within Logan County.

Figure 1-2. USGS Topographical Map showing Project Location.

Figure 1-3. Aerial Map showing Project Location.

1.6 Principal Investigator

The principal investigator for the project was J. Howard Beverly, MA, RPA.

1.7 Field and Laboratory Crew

The field crew consisted of Ann Wilkinson and Dona Daugherty. Ms. Daugherty served as the field director and planned, coordinated, and supervised field activities. Ann Wilkinson and Dona Daugherty prepared the final report and J. Howard Beverly, Jr. prepared the maps and formatted the report. Laboratory analysis was coordinated by Dona R. Daugherty. Artifact analysis was conducted by David McBride.

1.7.1 Field Effort

The total amount of time expended during fieldwork was 3 hours. Field work for the project was conducted on November 25th, 2014.

1.7.2 Laboratory Effort

The total number of hours expended to wash, catalog, analyze, and write up artifacts was 12 hours. Identification of artifacts was conducted using available library references and by comparison with artifact collections at CDMS.

1.8 Maps and Figures

Maps and figures for this report were prepared using a combination of Microstation design files, GIS data overlays, and databases gathered from a number of different resources. Existing site information was provided by the OSA. Soil mapping was provided by United States Department of Agriculture online and printed resources. Landowner data and vegetation coverage were obtained from aerial photographs and field reconnaissance. All GIS work was conducted by J. Howard Beverly, Jr.

1.9 Curation

All field notes, maps, forms, and artifacts will be curated at the University of Kentucky's curation facility, the William S. Webb Museum of Anthropology.

1.10 Summary of Investigations

A Phase I archaeological survey was conducted by archaeologists from CDMS at the request of the KYTC ahead of proposed improvements and bridge replacement over Pleasant Run along BR 549, mile points 3.00 – 3.60, in Logan County, Kentucky (KYTC Item Number 3-1073.00). The total APE measures 0.27 acres (0.109 ha). The survey identified one previously unrecorded archaeological site, 15LO267. This surveyed portion of the site was determined to be ineligible for the National Register of Historical Places (NRHP). No further archaeological work is recommended within the APE.

Section 2 - Environmental

Aspects of the natural environment often influence the development of prehistoric and historic communities. In this section, the environmental background of Logan County and the surrounding region is reviewed. Environmental data includes physiography, geology, hydrology, soils, climate, flora, and fauna.

2.1 Physiography and Topography

Kentucky can be divided into six primary regions: the Cumberland Plateau (Eastern Coalfields) in the east, the north-central Bluegrass Region, the northeast-central Knobs Region, the south-central and western Pennyroyal Plateau, the Western Coal Fields and the far-west Jackson Purchase. The Bluegrass Region is divided further into two regions - the Inner Bluegrass and the Outer Bluegrass.

Logan County lies within the Western Pennyroyal Region (Figure 2-1). This region is of the Mississippian age, and consists of mainly limestone but in places there are interbedded limestone, sandstone, and shale. Logan County is divided into northerly and southerly sections by the Dripping Springs Escarpment, a south-facing cuesta. The northern section has a more dissected and varying topography and higher elevations than to the south (although the escarpment itself offers the county's highest elevations from 800 to 868 ft. AMSL). Tan Knob and Iron Mountain in this northern section reach 762 and 720 ft. AMSL respectively, and the lowest points in the county are in the northwestern corner of Logan County along the Mud River and Lake Malone at 395 and 450 ft. AMSL, respectively (McGrain and Currens 1978). The section of Logan County south of the Dripping Springs Escarpment is a karst plain, pitted with sinkholes. Elevation range in this section ranges between 550 ft. AMSL along streams to 650 ft. AMSL on low ridges (McGrain and Currens 1978).

2.2 Geology

The southern half of Logan County, part of the Western Pennyroyal physiographic region, is a karst limestone plain characterized by sinkholes and deeply incised streams (Figure 2-2). This area is primarily composed of horizontally bedded Upper Mississippian limestone formations, but in places the limestones are interbedded with resistant sandstones, shales, and coals (Dye et al. 1975:75). The upland plain of the Mississippian Plateau, or Pennyroyal Plain area (Sauer 1927: 36-45), is overprinted by complex patterns of sinkholes. Extensive solution weathering of the limestones and dolomites has produced a mantle of insoluble residuum, including fragments of chert, which is locally tens of feet thick where transported and concentrated in sinkholes. Prior to modern agriculture, much of this terrain was known as the "Barrens", a pioneer term for grassland prairies.

The Pennyroyal and Western Coalfields are separated by the Dripping Springs Escarpment, a south-facing "solution" cuesta that rises about 45 m (150 ft.) above the karst limestone plain. Isolated sandstone-capped hills, rising above the sinkhole plain, are erosion remnants of the Dripping Springs Escarpment, which has formed by solution weathering of the limestone strata (Dicken 1935). Near the escarpment, the sides and bottoms of the valleys are formed from limestone and contain many large caves (McGrain 1983; McGrain and Currens 1978: 49-50). The cuesta forming the Dripping Springs Escarpment is composed of the St. Louis, Ste. Genevieve, and Girkin Limestones and is capped by the Big Clifty Sandstone Member of the Golconda Formation.

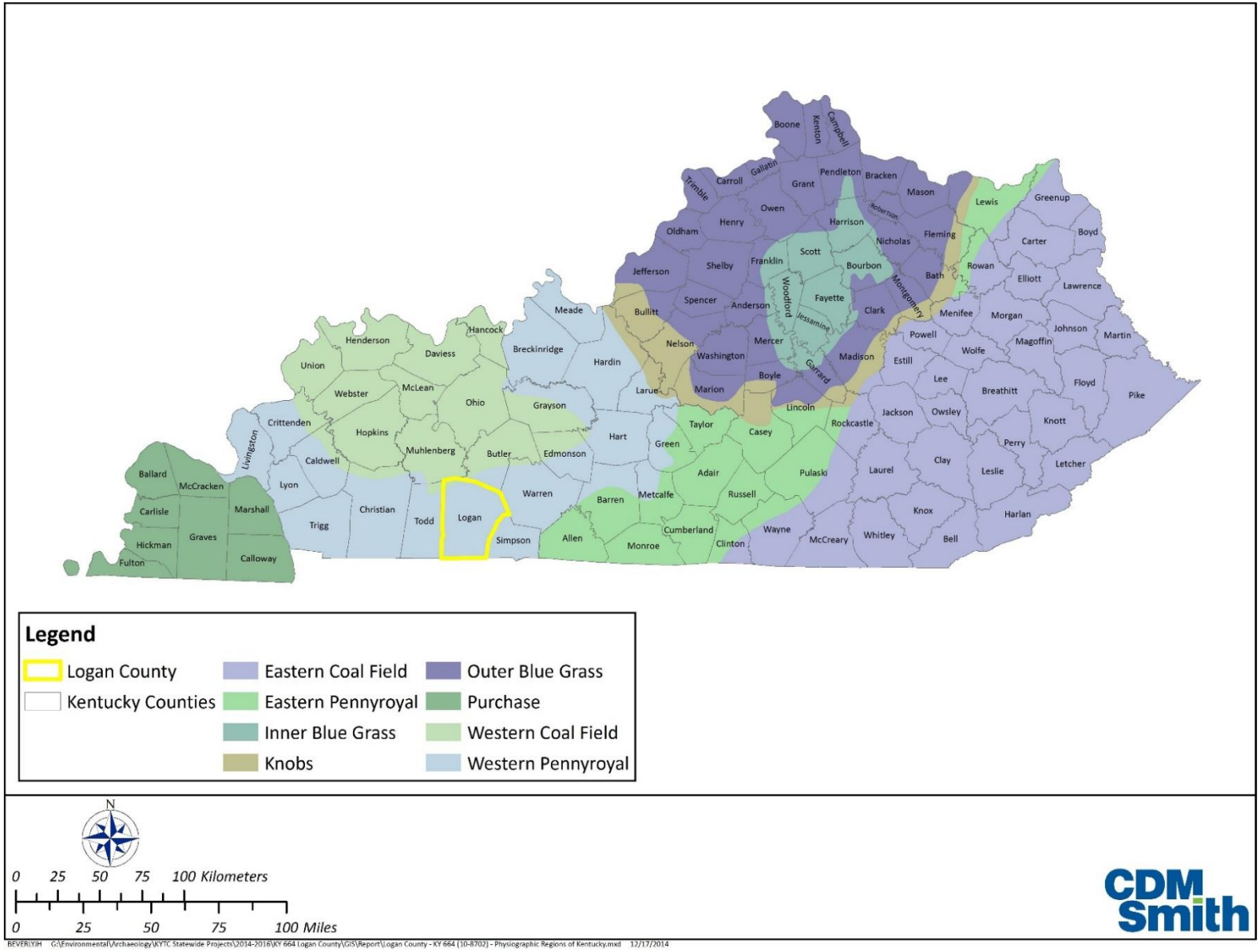

Figure 2-1. Physiographic Map of Kentucky.

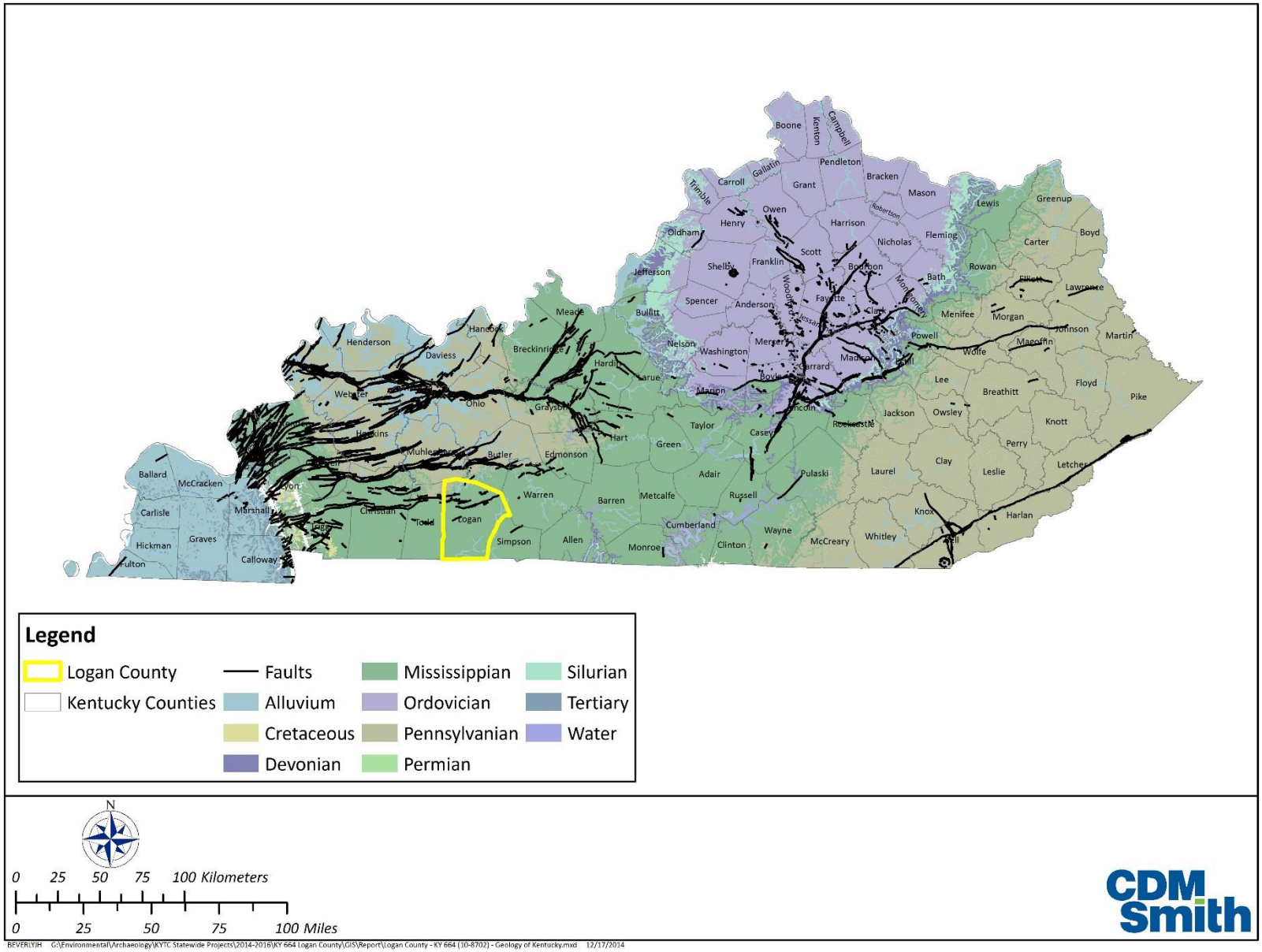

Figure 2-2. Geologic Map of Kentucky.

The entire APE is on an area of Alluvium deposits closely surrounded by St. Louis Limestone formation and with ridgetops with weathered Ste. Genevieve Limestone formation within one kilometer. The geology of the APE is shown in (Figure 2-3).

The unconsolidated deposits consist of Alluvium (Qal) sediment deposited by flowing water. It forms terraces and narrow floodplains of varying width along streams (Carey and Stickney 2005). Alluvium deposits are found throughout Kentucky along most of the larger streams and tributaries as boulders, cobbles, pellets, sand, silt and clays. It may also include sediment deposits found on terraces and floodplains, and in some cases as outwash deposits. In northern Kentucky, along the Ohio River, it may be present as lacustrine and eolian glacial deposited sediments. Most alluvium is Holocene, some is late Pleistocene, and the alluvium within and surrounding the current project area is described as having a Quarternary origin (McDowell and Newell 1986:H51-H52; Shaw 1966).

Both the Ste. Genevieve (Msg) and St. Louis (Msl) Limestone Formations are part of the Carboniferous/Mississippian Systems and Upper Mississippian Series, with the former overlying the latter. Ste. Genevieve Limestone tends to be a very poorly exposed and heavily weathered in this region so that its depths reach only about 45 feet. This limestone is partly oolitic, cherty (beds and stringers only), medium-grained, and clastic (Shaw 1966).

The St. Louis Limestone Formation by contrast 250 feet deep, give or take, in this area and consists of very fine to medium-grained with dolomitic inclusions and with chert beds, stringers, and nodules (Shaw 1966).

2.3 Hydrology

Kentucky is home to the most navigable inland waterways in the lower 48 states. Part of Kentucky's boundary with other states is formed by a few major drainages. The eastern boundary with West Virginia is demarked by the Big Sandy River. It joins the Ohio River near Ashland. The Ohio River then forms the northern boundary with Ohio, Indiana, and Illinois. The western boundary with Missouri is formed where the Ohio River merges with the Mississippi River.

The major drainages of Kentucky include the Big Sandy River, the Ohio River, and the Mississippi River. The interior is drained by smaller drainages that mostly flow into the Ohio River. These include the Licking, Kentucky, Salt, Green, Tradewater, Cumberland and Tennessee Rivers (Bladen 1984:13-14).

There are no natural lakes found completely within Kentucky. Only Reelfoot Lake, a naturally occurring lake in Tennessee, occasionally extends into Fulton County during wet weather (Bladen 1984:14).

More than half of the surface drainage in Logan County flows northward. The Mud River and Muddy Creek watersheds flow northward to their confluence with the Green River (Dye, Barton, and Froedge 1975). The Gasper River also flows northward to the Barren River, which then empties into the Green River. The southern portion of the county drains southwardly into the Red River (Dye, Barton, and Froedge 1975).

The project area is located within the Red River watershed of the Cumberland River Drainage Basin and is directly drained by Pleasant Run (Figure 2-4).

Figure 2-3. Geology of the Project Area.

Figure 2-4. Hydrology of the Project Area.

2.4 Soils

Most of the soils found in Kentucky developed under the same formation processes and climate conditions. The differences in soils from one area to another are chiefly dependent on three factors: parent material, the topography where the soils are found, and the amount of time exposed to erosional forces.

There current project is situated in an area of the Pembroke-Crider soil association. This association is found across 37 percent of Logan County and typically offers broad, gently-sloping areas cut by streams and sinkholes, the current project area being no exception. The floodplains are underlain by deep alluvium while the higher ground is underlain by limestone residuum (Dye et al. 1975). There are two soil types found within the project area (Figure 2-5). They are described below.

The Dunning silty clay loam (Du) soils are found on upland depressions and, as in the current project area, on level floodplains. The parent material consists of clayey alluvium. These soils are subjected to occasional flooding with a water table from 0 to twelve inches below surface and the soils tend to be slightly acid to mildly alkaline. Restrictive Features are not encountered until around 80 inches. Dunning soils serve better for pasture than cultivation (Dye et al 1975; USDA 2014).

The Newark silt loam (Ne) soils are permeable, medium acid, poorly drained, soils. The parent material consists of mixed fine-silty alluvium derived from limestone, sandstone, and shale. The soils are found on floodplains and the water table sits between 12 and 18 inches below the surface. The soils are considered good for water resistant crops, hay, and pasture (Dye et al. 1975; USDA 2014).

2.5 Cherts

Raw materials for stone tool manufacture are abundant in the geologic formations of the Pennyroyal, the Dripping Springs Escarpment, and the Western Coalfields. Chert-bearing formations occurring in the Pennyroyal in the vicinity of this project area include St. Louis, Ste. Genevieve, Girkin, Renault, Haney, and Paint Creek Limestones. To the north, the Dripping Springs Escarpment and Western Coal Fields regions contain Renault, Paint Creek, Haney, Vienna, Waltersburg, Menard, and Caseyville chert-bearing formations. Pleistocene alluvial gravels along streams in the Pennyroyal and the Western Coal Fields regions contain secondary deposits of chert cobbles and pebbles eroded from each region's particular chert-bearing formations (Pace 1987: 1-3).

Both the Ste. Genevieve Limestone and St. Louis Limestone are chert producing Formations and are present on the Adairville, Kentucky-Tennessee geologic quadrangle map (Shaw 1966a). These same formations are present on the Dot and Prices Mill geologic quadrangle maps to the west and east of the project area (Shaw 1966b; Shawe and Rainey 1965). The Russellville quadrangle to the northwest offers outcroppings of Paint Creek, Haney, Renault, and Ste. Genevieve Limestone Formations, while Dennis and Auburn to the north and northeast both offer Girkin, Ste. Genevieve and St. Louis Limestone Formation outcroppings (Miller 1968; Rainey 1965a; Rainey 1965b).

2.6 Prehistoric Climate Conditions

The beginning of the Holocene Age, dating between 12,700 and 11,300 before present (B.P.), is believed to be associated with major and rapid warming temperatures, decreases in cloud cover, and generalized landscape instability (Delcourt 1979:270). Estimated temperature increases during this period are three times greater than later Holocene fluctuations. During the early Holocene, rapid increases in boreal plant species occurred on the Allegheny Plateau in response to the retreat of the Laurentide ice sheet

Figure 2-5. Soils in the Project Area.

from the continental United States (Maxwell and Davis 1972:517-519; Whitehead 1973:624). At lower elevations, deciduous species were returning after having migrated to the southern Mississippi Valley refugia during the Wisconsin advances (Delcourt and Delcourt 1981:147). The climate during the early Holocene seems considerably cooler than the modern climate, and extant species in upper altitude zones of the Allegheny Plateau reflect conditions most similar to the current Canadian boreal forest region (Maxwell and Davis 1972:515-516).

Conditions at lower elevations were probably less severe and favored the transition from boreal to mixed mesophytic species. Middle Holocene (8,000 to 4,000 B.P.) climate conditions appear to have been consistently drier and warmer than twentieth century conditions (Delcourt 1979: 271; Wright 1968). The influx of westerly winds during this Hypsithermal climatic episode contributed to periods of severe moisture stress in the Prairie Peninsula and to an eastward advance of prairie vegetation (Wright 1968). Delcourt has identified Middle Holocene moisture stress along the Cumberland Plateau in Tennessee, but indicated that upland barrens did not expand appreciably as did the Midwestern prairies (Delcourt 1979:274). Changes in Archaic settlement patterns in both central and northern Missouri have been associated with possible decreases in upland resource availability during the Hypsithermal.

The earliest distinguishable Late Holocene climatic episode began circa 5,000 to 4,000 B.P. and ended around 2,800 B.P. This episode is associated with the establishment of modern deciduous forest communities in the southern highlands and increased precipitation across most of the mid-continental United States (Delcourt 1979:270; Maxwell and Davis 1972:517-519). Beginning around 2,800 B.P., warm conditions similar to the modern climate prevailed until the onset of the Neo-Boreal episode around 700 B.P. Fluctuations in this Late Holocene Pacific episode appear to have varied locally, with either increased or decreased temperatures and precipitation (Delcourt 2002). Certain fluctuations have been associated with adaptive shifts in midwestern prehistoric subsistence and settlement systems. An example is Struever and Vickery's (1973) suggestion of a possible correlation between the onset of a cooler and moister period circa 1,600 B.P. and increased use of polygonum species (smartweed) by Late Woodland groups in the Midwest (Struever and Vickery 1973:1215-1216). Researchers have inferred warmer temperatures for the Great Plains and drier conditions for the Upper Great Lakes during this same period (1,600-1,300 B.P.) (Delcourt 2002). Other fluctuations during the Pacific episode are similarly non-uniform across the mid-continental United States; however, the interfaces of all fluctuations are generally consistent.

Local paleoecological evidence is required to determine the kinds of climatic fluctuations Woodland populations experienced during the Pacific episode. Given evidence of fluctuations elsewhere, it is most likely that changes occurred circa 1,700 B.P., 1,300 B.P., and 900 B.P., with a possible fourth change around 2,300 B.P.

Studies of historic weather patterns and tree ring data by Fritts (1971) have indicated that climatological averages are "unusually mild" when compared with seventeenth and nineteenth century trends. His study suggests that winters were generally colder, weather anomalies were more common, and severe winters were more frequent between A.D. 1602 and 1899 than after 1900. These cooler, moister conditions are associated with the Neo-Boreal episode, or Little Ice Age, which began around 700 B.P. and coincided with minor glacial advances in the northwest and Europe.

The effects of the Neo-Boreal episode, which ended during the mid- to late nineteenth century, have not been studied in detail for this region. Despite this, it appears that the area experienced less radical temperature decreases during the late Neo-Boreal than did the upper Midwest and northern Plains (Fritts 1971). Related changes in extant vegetation should therefore be more difficult to detect. It is

probably safe to assume, however, that average temperatures were at least a few degrees cooler during the late Prehistoric and early Historic periods. The frequency of severe winters and average winter precipitation were probably greater as well.

2.7 Current Climate Conditions

Logan County has a temperate climate with moderately cold winters and warm, humid summers. The precipitation is well distributed throughout the year, and the county averages 122.43 cm (48.2 in.) of rain annually, with an additional average of 45.72 cm (18 in.) of snow per annum (Dye, Barton, and Froedge 1975).

2.8 Prehistoric and Present Flora and Fauna

The archaeological APE is included in the Western Mesophytic Forest Region, which is transitional between the extremely diverse Mixed Mesophytic Forest of the Appalachian Mountains and the Tall-Grass Prairies of the Midwest. The Western Mesophytic Forest contains a wide variety of vegetation climaxes and subclimaxes throughout its range, with oak and hickory as the dominant species. Trees commonly occurring in the archaeological APE include chinquapin, red oak, water maple, honey locust, elm, black cherry, hackberry, Kentucky coffeetree, walnut, shagbark and butternut hickory, basswood, sycamore, box elder, willow, and cedar. Common shrubs include sumac, blackberry, poison ivy, Virginia creeper, pawpaw, spicebush, plum, hornbeam, redbud, wild grape, and buckberry. Some of the common native herbaceous plants are ironwood, milkweed, cane, nettle, white snakeroot, bloodroot, spring beauty, trillium, violets, cardinal flower, wild strawberry, goldenrod, and May apple.

These forest communities have produced and supported a wide variety of animals, such as white-tailed deer, red fox, raccoon, squirrel, rabbit, groundhog, other mammal species, birds, reptiles, amphibians, fish, and mollusks (Barbour and Davis 1974; Esarey et al. 1992: 4). During prehistoric times white-tailed deer was by far and away the most important animal resource. Other species were also exploited, including turkey, fish, waterfowl, and mollusks (Fenton et al. 1996).

2.9 Current Land Use

Present land use for the Archaeological APE includes creek beds, scrub and brush areas, and agricultural areas. The current land use for the APE is shown in Figure 2-6 and Figure 2-7.

Figure 2-6. Creek Bed and Scrub and Brush Area inside the Project Area, Looking North-northeast.

Figure 2-7. Agricultural Area inside the Project Area, Looking East-southeast.

Section 3 –

Cultural Context, Previous Investigation, and Summary of Known Sites

In this chapter, the cultural history of Magoffin County and this region of Kentucky are reviewed. The research methodology used to develop this background and context involved archival research at the Office of State Archaeology, and research at the University of Kentucky's various libraries. Included within the cultural history section are reviews of the known prehistory from the State Plan for this part of the Commonwealth (Applegate 2008; Jefferies 2008; Maggard and Stackelbeck 2008; and Pollack 2008) followed by a consideration of the major historic time periods and sub periods (McBride and McBride 2008). This general review of the culture history of the region is followed by a synopsis of the cultural resource management recommendations for sites already documented within two kilometers of the archaeological APE. These recommendations are in accordance with the Kentucky Heritage Council specifications (Sanders 2006).

The prehistoric cultural chronology of Kentucky is divided into a series of periods that generally correspond to major shifts in subsistence procurement strategies, social organization, technology, and settlement patterning. They are also linked to distinct material cultural styles, particularly in projectile point shapes and (in later times) ceramic vessel form and decoration. These periods form a convenient framework for the discussion of human societies in eastern North America.

Since the Late Pleistocene, humans have occupied all areas of the continental U.S., adapting to the regionally diverse ecosystems and the long-term changes brought about by human occupation. Only the past 500 years is historically documented in any fashion; most of the past 15,000 years can be documented only by the study of prehistoric sites. This period of prehistory is commonly divided into four major chronological periods, which are discussed below.

3.1 Prehistoric Period

This section examines general prehistory of the archaeological APE. The prehistory of the archaeological APE area can be usefully divided into four major periods: Paleoindian, Archaic, Woodland, and Late Prehistoric. Each of these periods is discussed below.

3.1.1 Paleoindian Period

The Paleoindian period's beginning is uncertain, but recent discoveries have pushed the date to at least 1,000 years before the earliest Clovis site date, and the period continues to circa 8,000 B.C., coinciding with the end of the Pleistocene and the beginning of the Holocene (Maggard and Stackelbeck 2008). The Monte Verde Site, located in southern Chile, puts humans in South America by at least 11,000 B.C. (Dillehay 1997, 1989; Meltzer et al. 1997), suggesting that initial entry into North America would be around 14,000 to 15,000 years ago. Within the last two decades, the Clovis-first theory of a homogeneous 'founder' culture has been questioned. The theory points to a common culture colonizing the New World, resulting in similarities of archaeological expressions and human physiology. However, biological, skeletal, linguistic, and genetic studies do not support this theory, but instead imply that a range of diversity existed (Maggard and Stackelbeck 2008).

The earliest documented inhabitants of the continental U.S. crossed from Asia sometime before 13,000 B.C. However, the colonization of North and South America most likely varied in the rate of exploration and expansion, and may have consisted of multiple and separate migrations. These migrations may have involved various cultural groups, who may or may not have originated from different geographic regions (Bonnichsen and Turnmire 1999; Bryan 1991; Dixon 1999; Gruhn 1987, 2004; Maggard and Stackelbeck 2008; Merriwether 2002; Schurr 2004). The adaptation to a new climate and ecological condition would likely produce cultural variability as seen at the Nenona complex of Alaska, the Western-stemmed Tradition of the Great Basin and Columbia Plateau, and maritime-focused coastal California sites (Maggard and Stackelbeck 2008). The above listed cultures are distinctly different than the traditional characterization of Clovis in their economic practices and technological traditions (Maggard and Stackelbeck 2009).

The arrival of humans in the region was probably linked to the movements of the Pleistocene glaciers. During the Paleoindian period, the last of these glacial advances and retreats, called Great Lakes Stadial (after 9,900 B.C.), occurred. Although the glaciers never actually extended south of the Ohio River, the climatic effects were felt. A cooler, moister climate affected the composition and distribution of floral and faunal communities (Delcourt and Delcourt 1982; Klippel and Parmalee 1982).

The Clovis phenomenon may not have been the initial migration into the New World, but remains significant in how rapidly the people, technology, and/or economy spread across North America (Anderson et al. 1996; Meltzer 2002; Maggard and Stackelbeck 2008).

The Paleoindian period is poorly understood in Kentucky and in the Southeast as a whole. Much of the information concerning Paleoindian subsistence, settlement patterns, and chronology comes from information outside of Kentucky because dated Paleoindian material in Kentucky is limited. Twelve Paleoindian sites have been recorded for the Upper Kentucky/Licking Management Area by 2008 (Maggard and Stackelbeck 2008).

3.1.1.1 The Early Paleoindian: Pre-Clovis

The Pre-Clovis period dates from sometime before 13,000 B.C. to 9,500 B.C. In Kentucky, no sites from this time frame have been recovered, but several sites near Kentucky have reported cultural material in depositional contexts located stratigraphically below a Clovis layer. Cactus Hill is a stratified, multi-component site, located on a coastal plain of Southeastern Virginia. The site has a well-defined Clovis layer with fluted points, other tools, a hearth feature, and a radiocarbon date of ca. 8,900 B.C. Beneath the Clovis layer, several clusters of small quartzite flakes, small prismatic blades, blade cores, and retouched flakes were recovered. The quartzite came from locally-available cobbles. A charcoal concentration gave a radiocarbon age of 13,120 B.C. (15,070±70 B.P.), and soil samples collected yielded dates of 14,720 B.C. (16,670±730 B.P.) and 14,990 B.C. (16,940±50 B.P) (Maggard and Stackelbeck 2008; McAvoy and McAvoy 1997; Wagner and McAvoy 2004).

Meadowcroft Rockshelter is another example of pre-Clovis deposits. The site overlooks a tributary of the upper Ohio River, and consisted of stratified and multicomponent deposits that span the Late Pleistocene and Holocene (Adovasio et al. 1980, 1990, 1999; Adovasio and Pedler 2004; Maggard and Stackelbeck 2008). An unfluted, lanceolate-shaped projectile point was found from the lower levels of the shelter and was dated to 10,800-9.300 B.C. Small prismatic blades were also found in these lower strata. However, the site is controversial due to possible particulate and/or soluble contaminants in the lower deposits (Haynes 1980, 1987; Maggard and Stackelbeck 2008; Tankersley et al. 1987; Tankersley and Munson 1992).

Traditional time frames have recently been questioned, and although little is known about the pre-Clovis period, more attention will now be paid to layers beneath Clovis deposits. As a result, a better understanding of the pre-Clovis period will be possible.

3.1.1.2 The Early Paleoindian: Clovis

The Clovis culture dates from ca. 9,500 B.C. to 8,800 B.C., and is widely documented throughout North America and Kentucky (Anderson et al. 1996; Haynes 2002; Maggard and Stackelbeck 2008; Tankersley 1990a). Clovis projectile points are the hallmarks of the early part of the Paleoindian period. The hafted bifaces are distinctively lanceolate-shaped and often fluted. In addition to the Clovis point, unifacially and bifacially chipped tools such as knives, scrapers, spokeshaves, end scrapers with spurs, drills, and gravers have also been recovered (Boldurian and Cotter 1999; Frison 1999; Haynes 2002; Maggard and Stackelbeck 2008; Sanders 1990; Stanford 1999). Clovis points were multifunctional and often displayed resharpening along the distal margins of the blade (Boldurian and Cotter 1999; Kay 1996; Maggard and Stackelbeck 2008; Ray 2003). Archaeologists infer that tools of wood, bone, and shell were used, although their preservation is rare in the archaeological record. A number of these tools were manufactured for the killing and butchering of extinct fauna, including megafauna. For instance, at the Adams Mastodon site in Harrison County, Kentucky, the remains of a single mastodon were found in association with large limestone slabs and cut marks on the bones. The configuration of the skeletal remains, in addition to the above evidence, has been interpreted as possible human butchering (Duffield and Boisvert 1983; Walters 1988).

Most sites within Kentucky are short-lived, small occupations, occurring in shallow, deflated, or disturbed deposits, producing a low density of artifacts (Freeman and Smith 1996: 402; Maggard and Stackelbeck 2008). These small sites could represent short-term habitations that may have been used for various activities, such as temporary use sites and kill/butchering sites. The Adams Mastodon Site (15HR14), Big Bone Lick (15BE18, 15BE269-272), and Clay's Ferry Crevice (15FA163) site may all be kill/butchering sites, but no Early Paleoindian artifacts have been associated with Pleistocene faunal remains (Haag 2004; Lowthert 1998; Maggard and Stackelbeck 2008; Tankersley 1996; Walters 1988). Clovis period sites in Kentucky tend to cluster near terraces along major stream confluences, around karstic features (sinkholes and sinkponds), and near outcrops of high quality lithic raw material. In addition, studies in Marion and Washington counties show a preference for upland and headwater locations. In western Kentucky, sites have been proposed to be 'staging areas' for exploration and settlement of other nearby areas (Anderson 1990). The Christian County quarry/habitation sites of the Little River complex seem to uphold this theory, but these sites are very different from other sites in Kentucky (Maggard and Stackelbeck 2008: 121). Clovis groups are believed to be highly mobile, and therefore, the varying location of Kentucky sites should be expected.

The Clovis groups are characterized as big game hunters (Kelly and Todd 1988; Maggard and Stackelbeck 2008; Tankersley 1990b, 1996), but no kill/butchering sites in Kentucky are certain. However, preservation of Pleistocene bones may have been poor in eastern North America (Dincauze 1993; Maggard and Stackelbeck 2008). Big game was exploited at the Kimmswick site in Missouri and the Coats-Hines site in Tennessee (Breitburg et al. 1996; Graham et al. 1981). However, the diverse local environment of eastern Northern America may have provided a foraging strategy that consisted of a wider range of options (Dincauze 1993; Maggard and Stackelbeck 2008; Meltzer 1993; Walker and Driskell 2007). At the Kimmswick site, small mammals, fish, reptiles, and birds were all exploited along with big game (Graham et al. 1981; Graham and Kay 1988; Maggard and Stackelbeck 2008). In fact, the overall Clovis subsistence strategy appears to rely less on big game and more on a variety of subsistence

choices (Cannon and Meltzer 2004; Collins 2007; Kornfield 2007; Maggard and Stackelbeck 2008; Meltzer 1993).

The Clovis period is poorly understood in Kentucky with few sites having intact deposits. The Clovis occupation appears dense and widespread, but little is known about the timing, range of site types, or subsistence strategies (Maggard and Stackelbeck 2008). Tankersley (1996) suggests that Paleo occupations occur as isolated hafted bifaces within multicomponent sites. Larger sites are associated with areas that have access to quality lithic raw material or resources that would attract game, such as mineral springs, slow moving water, and at stream confluences and fords (King 2002:15; Freeman and Smith 1996; 402).

3.1.1.3 The Middle Paleoindian

The Middle Paleoindian phase ranges from ca. 9,000 B.C. to 8,500 B.C., and was a time of great climatic change, leading to the extinction of most species of Pleistocene mega-fauna (Anderson et al. 1996; Delcourt and Delcourt 1981; Grayson 1987; McWheeney 2007; Maggard and Stackelbeck 2008; Morse et al. 1996). The change in the environment led to a more intense reliance on small game and locally available plant sources (Walker 2007). The Middle paleoindian lithic toolkits reflect this subsistence change in the wider range of tool types, such as limaces, spurred end scrapers, and a wide selection of flake tools. In addition, the toolkits relied more on local sources of chert, often of a lower quality. The increase in the utilization of local materials could represent a more settled lifestyle.

During the Middle paleoindian phase, a shift from direct to indirect percussion in fluting technology has also been noted (Maggard and Stackelbeck 2008; Morrow 1996; Ray 2003). The Cumberland and Gainey points emerged during this period. Gainey points, although similar to Clovis points, are thinner and have deeper basal concavities. Often, the distal end of the blade has been resharpened. Cumberland points, also similar to Clovis points, are usually longer and narrower with lateral proximal edges that expand slightly, giving it a 'fishtail-like' appearance (Justice 1987; Ray 2003; Tankersley 1996). Cumberland points were also often resharpened (Maggard and Stackelbeck 2008; Ray 2003).

Within Kentucky, Middle Paleoindian sites have a wider distribution than Clovis (Tankersley 1996). Sites have been recorded in the floodplain/terrace settings of the Purchase Management Area, in the Knobs region of the Salt River Management Area, and the uplands of the Upper Cumberland Management Area. Little is known about the Middle Paleoindian period in Kentucky. No sites have produced a radiocarbon date in direct association with diagnostic artifacts within Kentucky.

3.1.1.4 The Late Paleoindian

The Late Paleoindian period dates to ca. 8,500 to 8,000 B.C. During this period, the usage of local raw materials continues to be evident, with the overall quality of the chert material continuing to decrease (Maggard and Stackelbeck 2008). In addition, basal thinning replaces channel fluting, and the overall size of projectile points is reduced (Ray 2003). The toolkit is even more diverse than that of the Middle Paleoindian period. It includes beveled and backed bifaces, unifacial and flake scrapers, adzes, retouched flakes, and drills/perforators (Goodyear 1999; Maggard and Stackelbeck 2008; Morse 1997; Tankersley 1996).

The bifacially-flaked, lanceolate forms associated with the late Paleoindian period lack the characteristic flutes seen in the Early and Middle periods (Ray 2003; Tankersley 1996). At Kentucky sites, two stylistic clusters exist, Lanceolate Plano and Dalton, with the Lanceolate Plano being less common (Justice 1987; Ray 2003). The Dalton cluster includes the Beaver Lake, Quad, and the classic Dalton types (Justice 1987). The possibility of a migration from the west into Kentucky has been suggested based on

similarities between Kentucky Lanceolate projectile points and those documented in the Plains (Frison 1999; Stanford 1999; Wormington 1957).

Dalton cluster points are often identified by a 'fish-like' appearance, exhibiting extensive and even beveled resharpening above the haft element (Ray 2003; Tankersley 1996). The Beaver Lake types, though similar to Cumberland points, are shorter and narrower with the absence of flutes (Ray 2003). Quad points also demonstrate a 'fish-like' shape, but are short and wide and have basal ears that usually project from the widest section of the point (Ray 2003). In Kentucky, quad points range in length from 4.1 to 8.6 cm.

The Dalton type often demonstrates a serrated or right-handed beveled blade edge, but a large variation is found often due to resharpening (Ray 2003). Eventually, these points may reach a stage where they are converted into different tools. In Kentucky, Dalton point types range from 3.1 to 8.5 cm in length (Maggard and Stackelbeck 2008).

The Paleoindian phase continued to experience a vastly changing environment as seen in the Middle Paleoindian phase. Kentucky's spruce and jack pine parklands were replaced with mixed hardwood forests (Delcourt and Delcourt 1981). Mammoth, mastodon, horses, moose/elk, and other large herbivores became extinct. As a result, the shift towards a more varied subsistence strategy continued. At Dust Cave in Alabama, various nut species and animals were exploited within a Late Paleoindian component (Hollenbach 2007; Maggard and Stackelbeck 2008; Walker 2007; Walker and Driskell 2007). Across eastern North America, evidence exists that supports this change in subsistence strategies, from a big game emphasis to a broader foraging strategy. It is likely that such a change would lead to a less mobile lifestyle (Tankersley 1996). However, the change in subsistence could just be the result of regionalization, as groups began to settle into their environment, and begin to demonstrate characteristics common to certain regions (Maggard and Stackelbeck 2008).

3.1.2 Archaic Period

The Archaic period includes a long span of time during which important cultural changes took place. Because of the growing evidence for the existence of such transitional cultural manifestations, it is agreed generally that Archaic cultures evolved from late Paleoindian expressions of the Southeast and Midwest (Funk 1978:19). These manifestations probably occurred in response to environmental changes that took place at the close of the Pleistocene. The Archaic period is customarily divided into three sub-periods: Early (8,000-6,000 B.C.); Middle (6,000-3,000 B.C.); and Late (3,000-1,000 B.C.). Nevertheless, it is important to keep in mind that archaeologists often differ in opinion about these temporal boundaries, and they are best used only for general comparative purposes (Jefferies 2008).

During the Early Archaic, the last glaciers retreated and the arctic-like boreal forest began developing into the eastern deciduous forest. By the Middle Archaic, the environment was warmer and drier than it is today. In response to the changing climate and associated changes in plant and animal life, Late Archaic peoples developed a more diversified subsistence strategy. This included hunting, plant food gathering, fishing, and- in some areas- the beginnings of plant domestication in a planned seasonal round exploitation strategy. Caldwell (1958:6-18) has called this Archaic subsistence approach "primary forest efficiency." This strategy appears to have been a continuation of what had begun in the Middle and Late Paleoindian phase, and then continued well into the Woodland period.

As of mid-2006, Kentucky had recorded 4,703 Archaic components with the majority (seventy percent) concentrated in the Green River, Salt River, and Bluegrass Management Areas (Jefferies 2008). In contrast, little is known about Archaic presence in the Upper Kentucky/Licking, Big Sandy, and Upper

Cumberland Management Areas. As of 2008, one thousand four hundred and forty Archaic period sites had been identified in the Green River Management Area where the current project area is located (Jefferies 2008:214).

3.1.2.1 The Early Archaic Period

The limited amount of Early Archaic material found at most sites and the general absence of middens, features, and burials suggests that most occupations were of short duration. Early Archaic social units were small, probably consisting of bands comprised of related individuals. The relatively high percentage of projectile points in Early Archaic assemblages made from non-local cherts suggests that social groups were highly mobile. Items manufactured from non-local chert would have been incorporated into tool kits when groups traveled near the source areas. Some tools manufactured from certain kinds of high quality chert were used and curated for an extended period of time and later discarded far from the source area (Binford 1979; Jefferies 1990:151; 2008).

According to Jefferies (2008), except for the adoption of new projectile point styles, Early Archaic tool kits are nearly identical to those of the Paleoindians. The scarcity of tools associated with the preparation of plant foods and fishing in the early part of the Archaic indicates that hunting was probably still the major subsistence activity (Dragoo 1976: II).

Archaeological investigations at a number of deeply buried sites in the Southeast, like the Longworth-Gick Site near Louisville, Kentucky (Collins 1979), have provided important information on Archaic lifeways and their changes through time. Excavations in western Kentucky, southern Illinois, and southern Indiana have refined our understanding of regional Early Archaic chronology, settlement-subsistence strategies, and social organization (Smith 1994, Swan's Landing site [12HR304]; Smith and Mocas 1995, Paddy's West [12FL46]; Stafford and Cantin 2008, James Farnsley site [12HR520] at Caesar's Palace; Wagner and Butler 2000, Hills Branch Rock Shelter; Jefferies 2008).

The Longworth-Gick Site identified eight stratified Early Archaic components, recovering early archaic material from Zone III to Zone XIII, possibly Zone XXXVII (Collins 1979; Jefferies 1990, 2008). Small varieties of Kirk projectile points (7,540±230 B.C and 6,490±380 B.C.) were recovered from Zones XIII through VII, and Large Kirks (6,490±125 B.C.) were recovered from Zone V. Zone III contained LeCroy and Kanawha bifurcate base projectile points (6470±110 B.C.). The site appears to have been occupied for brief periods, most likely due to flooding. The most intensive period occurred during the Kirk (Zone VI and V) and the Bifurcate Base (Zone III) zones.

3.1.2.2 The Middle Archaic Period

The environment during the Middle Archaic sub-period was dryer and warmer than modern conditions. By the beginning of the Middle Archaic period, environmental remnants of the Pleistocene had disappeared and animal and plant communities more closely resembled those present at the time of European-American contact. Pollen records from some parts of the region indicate that drier climatic conditions associated with the Hypsithermal interval reached their maximum around 6,500 B.P. (King and Allen 1977). The subsequent reduction of arboreal communities and the influx of grass and herb communities appear to have affected Middle Archaic settlement and population distributions (Conaty 1985; Janzen 1977; Jefferies 1983; Nance 1985).

Increasing regionalization of artifact inventories and the addition of new artifact classes and projectile point styles implies the development of extensive exploitation strategies. The Middle Archaic is marked by the introduction of groundstone artifacts manufactured through pecking, grinding, and polishing. A number of these groundstone tools, such as manos, mortars and pestles, and nutting stones, are

interpreted as plant food processing artifacts, indicating an increasing utilization of plant food resources during the Middle Archaic.

Little is understood about the Middle Archaic subsistence strategies in Kentucky, but white-tailed deer and wild turkey are both widely regarded among scholars as important sources of meat during that sub-period. Within nearby states, a subsistence strategy that included hunting a variety of animals existed, which likely is true for Kentucky's Middle Archaic residents. In addition, a variety of nuts, especially the hickory nut, along with fruits, starchy seeds, and a wide range of plant resources were exploited during this period (Jefferies 2008).

New projectile point styles appeared during this sub-period, such as stemmed and corner notched points. The presence of a variety of bone tools, including antler projectile points, fishhooks, and gouges, suggests an improved efficiency in exploiting local resources. Middle Archaic sites tend to contain larger accumulations of materials than those of earlier periods, suggesting an increased group size and/or longer periods of occupation (Cohen 1977:191). Chapman (1975) has suggested that projectile points were probably used in conjunction with the atlatl, a device that increases the distance and accuracy of a thrown spear. The recovery of bone and groundstone objects (banner-stones) in Middle Archaic contexts that are interpreted as atlatl weights tends to support this suggestion (cf. Neuman 1967:36-53). Certain classes of chipped stone tool artifacts, such as scrapers, unifaces, drills, and gouges indicate a continuation of their importance as seen in earlier periods.

High group mobility, like that of the Early Archaic period, is suggested by the ephemeral nature of most early Middle Archaic occupations (Jefferies et al. 2005; 2008). However, the difficulty in identifying diagnostic projectile points may explain the lack of early Middle Archaic components (Stafford and Cantin 2008). Late Middle Archaic sites tend to contain deep middens, a high diversity of tool types, and burials, suggesting the sites were intensively occupied on a long-term or year-round basis (Conaty 1985; Janzen 1977; Jefferies 1983; 2008; Jefferies et al. 2005; Nance 1985; Stafford 1994).

Major Middle Archaic sites include Highland Creek (Maggard and Pollack 2006) and Morrisroe (Nance 1985) in Kentucky; Eva (Lewis and Lewis 1961), Anderson (Dowd 1989) and Icehouse Bottom in Tennessee (Chapman 1997); Black Earth (Jefferies and Lynch 1983), Koster (Cook 1976) and Modoc Rock Shelter (Fowler 1959; Styles et al. 1983) in Illinois; and several sites in the North Carolina piedmont (Coe 1964). In eastern and central Kentucky, Middle Archaic adaptation is very similar to Early Archaic. However, in the Green River area, a decrease in hunter-gatherer mobility and longer occupations seem to be the trend.

In the Falls of the Ohio River region, Granger's (1988) investigation of Archaic settlement patterns resulted in the definition of the late Middle Archaic Old Clarksville (4,000-3,000 B.C.) and the Terminal Archaic Lone Hill (2,400-1,200 B.C.) phases. Additional data supporting Granger's work includes the following: KYANG (Kentucky National Guard) (15JF267), McNeeley Lake (15JF200), and Mill Creek Station (15JF206) (Bader 1992; Bader and Granger 1989; Granger et al. 1992; Janzen 1977; Kreinbrink 2008). The KYANG site, located on a knoll overlooking a former marsh and sluggish stream, revealed two distinct midden zones, the upper with a Lone Hill phase and the lower with an Old Clarksville phase (Bader and Granger 1989). The Old Clarksville phase contained 32 flexed burials with numerous grave goods, including engraved bone pins; bear, dear and wolf tooth necklaces; red ochre; and an assortment of chert implements. Side-notched specimens, such as Big Sandy, Salt River Side Notched, and Brewerton types, were recovered, and a radiocarbon date put the occupation at ca. 3,060 B.C. (Bader and Granger 1989; Jefferies 2008).

In the middle Ohio Valley there appears to be at least two Middle Archaic horizons, although the second is not particularly well documented. The first is the North Carolina sequence, first defined by Coe (1964). The second Middle Archaic manifestation is represented by corner-notched and side-notched Brewerton-like points, which are typically thought of as Late Archaic points, but they may well have first appeared during the Middle Archaic (Hemmings 1977; Wilkins 1978).

3.1.2.3 The Late Archaic Period

The Late Archaic was a time of continued cultural expansion and growing complexity. Dragoo (1976:12-15) has discussed several Late Archaic traditions for the Eastern Woodlands. Their distinctiveness stems from varied regional responses reflected in material culture. Straight-stemmed, basal-notched, or contracted-base projectile point types characterize the Late Archaic. Judging from the greater number of sites that have been recorded, an increase in population can be postulated. Evidence of longer and more intensive site occupation suggests, in some cases, extended habitation within an area.

Aside from hickory nuts, a variety of other nuts, fruits, and seeds were exploited. The increased dietary significance of certain starchy seeds, such as goosefoot, marshelder, and knotweed, has been noted in the Eastern Woodlands (Cowan 1985:229-230). These seasonally available food resources were exploited at appropriate times during the social group's annual settlement/subsistence cycle. Group organization and movement were structured to efficiently accomplish these tasks. The occasional presence of native and tropical cultigens at some sites suggests that some Late Archaic groups were experimenting with horticulture (Chomko and Crawford 1978; Cowan et al. 1981; Watson 1985).

Population increase and, in some parts of Kentucky, an inferred increase in mortuary ceremonialism, have led some to suggest that a more complex social organization was developing in some areas of the eastern United States. Along the Green River in west-central Kentucky, large shell mound sites such as Chiggerville (Webb and Haag 1939), Indian Knoll (Webb 1946), and Carlson Annis (Webb 1950) contain hundreds of human burials and evidence of complex mortuary practices and rich ceremonial life. The development of inter-regional trading networks is indicated by the recovery of copper, marine shell, and other non-local artifacts from Late Archaic burials (Winters 1968) which testify to the growing complexity of burial ritual and the interaction of many groups (Dragoo 1976:17).

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and use of these plants as subsistence resources. Evidence of early cultigens has been documented at such sites as Koster in central Illinois (Brown 1977:168), at the Carlson Annis and Bowles sites along the Green River in west-central Kentucky (Marquardt and Watson 1976:17), and at Cloudsplitter shelter in Menifee County (Cowan et al. 1981).

Struever and Vickery (1973) have defined two plant complexes domesticated at the close of the Archaic, which continued in use into the Woodland period. One consisted of non-native plants such as gourd and squash, occurring sporadically but early, and corn, which did not become important in the Ohio Valley until circa A.D. 1000. The other was a group of native plants, such as Chenopodium, marsh elder, and sunflower. Recent research in Missouri, Kentucky, and Tennessee suggests that squash was under cultivation in the mid-south by the late third millennium B.C. (Adovasio and Johnson 1981:74) and that by the second half of the second millennium B.C., evidence from Illinois, Kentucky, and Tennessee demonstrates that squash, gourd, and sunflower were well established (Adovasio and Johnson 1981:74), although some view these plants as two different groups of cultigens: the East Mexican Agricultural complex and the Eastern United States Agricultural complex. The latter includes sunflower (Helianthus annuus), sumpweed (Iva annua), chenopod (Chenopodium sp.), may grass (Phalaris sp.), and knotweed (Polygonum sp.). The East Mexican Agricultural complex includes squash (Curcurbita pepo), bottle

gourd (Lagenaria siceraria), and maize (Zea mays). Watson (1976), like Struever and Vickery (1973), suggests that corn, squash, and bottle gourd were domesticated in Mexico and imported into the eastern United States by way of the Gulf of Mexico and then up the Mississippi River and its tributaries. The native cultigens consist of local species whose seeds recovered from archaeological contexts are much larger than those which grow in a natural state; hence, cultivation is inferred.

Plant domestication was an important factor in Late Archaic cultural development. Research at Cloudsplitter shelter has documented early plant domestication. Desiccated squash rind was found in a Late Archaic deposit associated with a radiocarbon date of 3728 +/- 80 B.P. (1778+/- 80 B.C.) (UCA 2313- K) (Cowan et al. 1981:71). Seeds of the Eastern Agricultural complex (sunflower, sumpweed, may grass, and erect knotweed) are sparse in the Late Archaic levels in the site, but after 3000 B.P. (1050 B.C.), all members of the Eastern Agricultural complex underwent a sudden and dramatic increase in the rate at which they were being deposited in the site, perhaps indicative of a wholesale introduction of the complex into the region at this time. The Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage experienced in several other river drainages in the East (Cowan et al. 1981:71).

The data from Cloudsplitter suggest that squash may not have diffused into the East or Southwest from Mexico as previously postulated by Struever and Vickery (1973), but that it may have evolved in situ from North American stock (Cowan et al. 1981:71). This interpretation seems to be substantiated by more recent investigations conducted throughout the southeastern and Midwestern United States.

3.1.3 Woodland Period

Although initially there was very little difference between Late Archaic and Woodland period settlement, over the two millennia of the period, Woodland cultures in the Ohio Valley diverged sharply from their Archaic beginning. Kentucky shared in this development that produced burial mounds and earthwork enclosures, some of the more notable prehistoric monuments in the Ohio Valley of Kentucky. These went along with intensification in the earlier efforts at plant domestication present in the Archaic period, the development of fired clay ceramic containers (first used as ceremonial containers, later used more widely), and the intensification of trade with distant regions of the Midwest in materials used specifically as burial offerings.

The Woodland period is customarily divided into Early (1000 B.C. – 300 B.C.), Middle (300 B.C. – A.D. 400), and Late (A.D. 400 – A.D. 1000) sub-periods. Of these, the Early Woodland is the least known, but reflects its Archaic origins. During the Middle Woodland, Kentucky was characterized by large burial mounds and earthwork complexes that are termed “Adena” and have counterparts north of the Ohio River. Towards the end of this sub-period, a few sites reflect the Hopewellian cultural fluorescence, best known from Ohio in the major earthworks of the Scioto valley. During the Late Woodland, a distinctive cultural adaptation developed with similar variants throughout the Middle Ohio River valley.

In Kentucky, the introduction of shell tempered pottery and maize-based field agriculture characterized the upper boundary of the Woodland period. The adoption of pottery technology occurred between calibrated date (cal) 1606 and 802 B.C. in the Salt River Management Section, cal 1258-829 B.C. in the eastern Ohio River II Section, and cal 1432-950 B.C. in the Southeastern Mountains Section (Applegate 2008). Few analyses of Woodland pottery have occurred within the Gorge Section of the Upper Kentucky/Licking Management Area and most have not been assigned to specific types (Applegate 2008).

The Office of State Archaeology records indicate that 2,920 Woodland period sites are documented in Kentucky. Seven hundred and forty-eight Woodland sites are in the Green River Management Area (Applegate 2008).

3.1.3.1 Early Woodland

Variation exists in accepted beginning and ending dates for the Early Woodland sub period throughout regions of Kentucky. In the Mississippi River, Northern Bluegrass, and Lower Big Sandy sections, Kreisa and Stout (1991), Duerksen et al. (1994, 1995), and O'Steen et al. (1991) determined that the sub period dated between 1000-200 B.C. In the Ohio River II Section, deNeeve (2004) placed the dates at 1000-150 B.C. The Central Bluegrass was dated to 1000 B.C.-A.D. 1 (Schlarb 2005), and the Gorge and Lower Big Sandy sections ranged between 800-200 B.C. (Gremillion 1993, 1998; Ison 1988; Applegate 2008; O'Steen et al. 1991; Railey 1991).

Pottery technology, the hallmark of the Early Woodland sub period, surfaced at different times across Kentucky. In fact, some Early Woodland sites are without pottery while some Late Archaic sites do have pottery technology. The impact of pottery on cultural adaptations varied as well. In rugged terrains, such as portions of the Upper Green River Section, pottery would hinder travel while baskets and squash/gourd containers were a more practical option (Carstens 1996:10; Applegate 2008).

Another technological change during the Early Woodland sub period included a shift from chipped stone end scrapers to bone beamers, and a shift from grooved axes to ungrooved celts (Applegate 2008). A celt requires less maintenance than a grooved axe which needs to be continuously relashed. The ungrooved celt and bone beamer remained in use until the Historic period.

Other groundstone tools utilized during the Early Woodland sub period did not deviate from those used in previous periods. Pestles, nutting stones, atlatl weights, and hammerstones all continued to serve a purpose (Applegate 2008). Bone and shell also were used by Early Woodland groups as seen in bone awls, flakers, reamers, handles, bowls, shell spoons, scrapers, beads, and gorgets (Applegate 2008).

In Kentucky, the earliest textiles were recovered from Terminal Archaic to the Early Woodland sites. The textiles were located in caves and rockshelters in the Upper Green River and Gorge sections. A variety of clothing, foot wear, and bags were woven during this sub period (Applegate 2008).

Trade networks had existed since the Late Archaic, but towards the end of the Early Woodland, an increase in the frequency of copper, mica, and exotic cherts was recorded.

Subsistence strategies did not differ much from previous periods, with hunting and gathering being the focus. Garden products also were a part of their diet, and an increase in cultivation of weedy plants and cucurbits developed. Deer, box turtle, small mammals, birds, fish, and mussels were all consumed.

Projectile points that mark this sub-period are dominated by notched and stemmed forms including Kramer, Wade, Savannah River, Adena, and Turkey-tail. While the majority of these point types date the early portion of the Early Woodland, the Adena point type is more common towards the end of the sub-period (Railey 1990:250).

Early Woodland populations tended to live in upland, ridge top, floodplain, rockshelters, and cave vestibules. Rockshelters were used in eastern and western Kentucky. Cave exploration and mineral mining, which began in the Late Archaic, intensified during the Early Woodland. As documented at Mammoth and Salts cave, gypsum, mirabilite, and epsomite were all mined from caves. Mining has been documented in the Upper Green River, Pennyroyal, and Lake Cumberland sections (Applegate 2008).

Some of the earliest known Early Woodland sites in Kentucky and in the Ohio Valley include Peter Village in Fayette County (Clay 1984, 1985, 1987) and the West Runway site in Boone County (Duerksen et al. 1995). Quite different sites, Peter Village was an enclosure first surrounded by a post stockade, later by a ditch and internal bank, while the West Runway site was a campsite with multiple hearths, suggesting a series of short-term occupations. Radiocarbon dates place the occupation of West Runway possibly as early as 600 B.C. and Peter Village at about 350-400 B.C. While West Runway, in the types of features and their clustering in this upland location, is not that different from a Late Archaic site, the Peter Village enclosure marks a sharp break with Archaic settlement systems.

At both sites, that hallmark of the Woodland period occurs: thick and relatively crude ceramics representing quite large containers. First called Fayette Thick pottery from its occurrence at the Peter Village site (Griffin 1943), the pottery occurs widely, though sparsely, across central and eastern Kentucky (cf. Clay 1980) with some variation suggesting different pottery-making groups. The type even occurs in small and early burial mounds, for example the Hartman mound in Boone County (Webb 1943) where it may date to ca. 400 B.C. At the Peter Village enclosure, it is hypothesized by Clay (1987) that groups gathered to mine a source of barite and galena that was then fashioned into pigments and objects for personal use and for trading with other groups. The large ceramic vessels represented at the site may have been "feast containers" made to serve large work crews on the spot. The occurrence of thick pottery at the Hartman burial mound suggests also that the pots may have been made to serve funeral parties during the course of burial ceremonies, the first indication of customs that would become common in the Middle Woodland.

3.1.3.2 Middle Woodland

In most parts of the Southeast and Midwest, the development of Hopewell is a distinguishing difference between the Early and Middle Woodland sub periods. However, in Kentucky, Hopewell does not have a deep effect on Woodland populations, and as a result, considerable continuity exists between the Early and Middle sub periods (Applegate 2008). In addition, regions within Kentucky seem to differ with the beginning and ending dates for the Middle Woodland as did the Early Woodland. In the Mississippi River Section, Kreisa and Stout (1991) set the sub period at 200 B.C.-A.D. 400, and in the Ohio River II Section, deNeeve (2004) gives the sub period at 150 B.C.-A.D. 500. The Central Bluegrass Section has been given ranges of 400 B.C.-A.D. 400 and A.D. 1-500 (Richmond and Kerr 2005; Schlarb 2005). Gremillion (1993) gave the Middle Woodland sub period in the Gorge Section a range from 300 B.C.-A.D. 500.

In the Bluegrass, Upper Kentucky/Licking, and Big Sandy areas, ceramic vessels tend to have plain exterior surfaces during the early Middle Archaic. Cordmarked, cord-wrapped dowel-impressed, or fabric-impressed exterior surfaces are common in the Purchase, Green River, and Upper Cumberland areas (Applegate 2008). In the Salt River and Ohio River I Sections, sherds that exhibit Havana-like or Hopewellian decoration were documented, and southeastern stamped ceramics were found throughout the state but at low frequencies. Late Middle Woodland ceramic vessels tend to have subconoidal or subglobular jars, with outflaring, recurved, or direct rims. Jars usually have cordmarked or plain exterior surfaces, and small quantities of simple stamped or check stamped sherds are present. Complicated stamped, brushed, or rocker stamped sherds are also found in small quantities, but are often used as indicators for the late Middle Woodland sub period.

Robbins, Motley, Gary, and Adena Stemmed (cal 88 B.C.-A.D. 239 [Dowell 1981] points area all found in both the Early and Middle Woodland sub periods. Copena and Copena Triangular, which are Triangular/Lanceolate forms, are considered diagnostic of the Middle Woodland sub period along with corner-notched forms, such as Snyders (cal 1258 B.C.-A.D. 425 [Mocas 1992]) and Affins Snyders

(Applegate 2008). Late Middle Woodland contexts demonstrate expanding stemmed and shallow side notched types, such as Steuben, Bakers Creek, Lowe, and Chesser (cal A.D. 268-887 [Crane and Griffin 1966]). In addition, chert bladelets are also considered diagnostic of the Middle Woodland sub period (Applegate 2008).

In mortuary-ritual deposits, exotic raw materials continued to be used, and seemed to peak in the early Middle Woodland, but then decline again during the late Middle Woodland. These exotic raw materials included copper bracelets and breastplates/gorgets, copper and mica head ornaments, marine shell beads, and Vanport chert bladelets (Applegate 2088).

Subsistence strategies did not differ much from the Early Woodland sub period. The Middle Woodland populations continued to rely on wild foods more than cultigens. Settlement patterns saw an increase in usage of floodplain zones. Activity areas are suggested by midden deposits and feature clusters. In western Kentucky, earthworks were sometimes associated with habitation areas, and in the Lower Big Sandy, Upper Big Sandy, and the Central and Eastern Bluegrass, postmold patterns have been discovered that suggest small, single- and double-post circular and square/rectangular houses (Applegate 2008). In the Gorge Section, rockshelter occupations appear to decline. Settlement hierarchies have been noted in the Mississippi River and Ohio River II Sections.

The Middle Woodland in Kentucky is marked notably by the construction of burial mounds that have been called Adena after a site in southern Ohio (Webb and Snow 1945; Webb and Baby 1957). Major mound excavations in the region of Fischer, Drake, Mt. Horeb, Morgan Stone, Wright, Ricketts, Camargo, and many others, have given archaeologists a detailed picture of burial customs during this time period (Clay 1986). Excavations at the small Auvergne mound in Bourbon County (Clay 1983) suggest that Native Americans from a larger area came together at the time of a death to feast at graveside.

Some of the large mounds, containing multiple burials, suggest that these groups often returned to the same mound to add more burials to the structure. At times the burial mound could, like the Wright mound in Montgomery County (Webb 1940), grow to an imposing size. Although we have considerable excavated evidence for burial customs, the total settlement system is not well understood (Clay 1998:13-19). Those responsible for the burial mounds may have lived widely dispersed throughout Kentucky in relatively small groups. Seen in this light, the elaborate burial sites (mounds) offered essential foci for scattered groups where they could meet and interact. There were also small, circular enclosures called ceremonial circles of which the Mount Horeb site in Fayette County (Webb 1941) is an excavated example. Late in the Middle Woodland, hilltop enclosures were constructed, such as Indian Fort Hill near Berea, Madison County, Kentucky. Still, daily domestic sites are very poorly understood, although examples dating to the time period have been found to the south on the Cumberland Plateau (Kerr and Creasman 1998).

Several Middle Woodland mortuary-ritual sites have been documented, such as the conical burial mounds. In the Bluegrass and Big Sandy areas, these conical burial mounds date to the early Middle Woodland, but in other areas, they date to the late Middle Woodland. Stone mounds date to the late Middle Woodland. Although rare, geometric earthworks and hilltop enclosures date to the late Middle Woodland. In the Central Bluegrass, non-mound ceremonial sites without burials have been documented, such as ritualistic feasting and ceremonial plant use (Applegate 2008).

3.1.3.3 Late Woodland

Defining the temporal parameters of the Late Woodland has not been an easy task. Clear boundaries have not been identified in the archaeological record, and diagnostic ceramic and lithic attributes,

although widespread, show little temporal variability within this period. As a result, the transition from Middle to Late Woodland traditions was a gradual process and not an abrupt one, since no dramatic shifts in cultural practice or in styles of tools or ceramics occurs (Pollack and Henderson 2000). Changes that did occur between the Middle and Late Woodland are probably linked to changes in plant subsistence strategies, hunting technologies, long-distance trade networks, and the degree of ritual expression (Pollack and Henderson 2000:615).

While Pollack and Henderson's study demonstrates continuity in material culture, analysis of some site data suggests that population increase or at least localized aggregation occurred, which over time may have led to a smaller number of larger settlements, or increased inter-community violence. In other words, population cycles may have impacted lifeways and contributed to some changes in subsistence, settlement organization, and the duration of a particular settlement. A recent survey of available radiocarbon-dated sites in Kentucky and adjacent parts of West Virginia reveals some trends during the Middle and Late Woodland that support (in part) a population increase, and possibly some subsequent population declines.

The above discussion has highlighted the fact that a large number of sites are assigned to the Late Woodland period, and that many have been dated. These dated sites suggest that the Late Woodland period, as Pollack and Henderson (2000) among others have suggested, can be subdivided into at least two sub-periods. This apparent division may reflect some cyclicity in population expansion, changes in subsistence, settlement re-organization, or the introduction or incorporation of new technologies- such as corn agriculture and the bow and arrow- into pre-existing cultural complexes. While these data provide a substantive framework that identifies some temporal parameters, recent syntheses- along with earlier studies of the Late Woodland period- suggest that within the region of southern Ohio, northern and central Kentucky, and extreme southern Indiana, a single cultural complex or phase was present: the Newtown tradition.

Griffin (1956:187), working on artifacts from the Turpin site in Ohio, recognized a previously undocumented cultural complex which he named "Newtown," and which he considered to post-date the Middle Woodland Hopewell tradition and to pre-date the Fort Ancient tradition in the Middle Ohio Valley. Although he could not discern the length of the period during which this Late Woodland culture flourished, he did suggest that little cultural progress was made during this period (Griffin 1952). Owing to the paucity of Late Woodland archaeological data, Griffin was unable to characterize the Newtown culture or ascertain if distinctive regional variations existed (1952, 1956).

More archaeological data has been gathered since Griffin's groundbreaking research, but considerable debate on the temporal and geographic extent of Newtown and other Late Woodland cultures still exists (e.g., Clay and Creasman 1999; Davis et al. 1997). Site assemblages throughout the region are linked by the occurrence of the ceramic complex known as Newtown Cordmarked, a type described by McMichael (1968) in the 1960s and characterized by large jars with thickened, angular shoulders. More recent research (e.g., Pollack and Henderson 2000; Seeman and Dancey 2000) indicates that while a thickened, angular shoulder may be a characteristic of some Newtown vessels, some site assemblages are considered Newtown even though they lack ceramic vessels with this particular characteristic.

Recent archaeological investigations at several sites in the region have revealed additional traits about Newtown phase assemblages (e.g., Ahler 1988; Dancey 1988, 1991, 1992; Henderson and Pollack 1985; Kreinbrink 1992; Railey 1990). Typically, Newtown lithic assemblages are characterized by Steuben, Lowe, or Chesser notched variety projectile points (see Justice 1987), thick stone bifaces, and small, triangular, shaped celts. The ceramic assemblage includes ceramic jars with incurvate to direct rims,

flattened lips, and vertical cordmarking on their outer surfaces. Personal adornment, highly developed in the preceding Middle Woodland period, was apparently limited in the Late Woodland, as Newtown assemblages are distinguished by a lack of decorative and personal ornaments. Seeman and Dancey report "...Late Woodland societies created virtually nothing that can be considered artistic..." (2000:598). The few documented artifacts showing artistic style include some stone and bone gorgets, bone pins, small mica sheets, limestone elbow pipes, and stone and shell beads.

Pollack and Henderson's recent review of the Late Woodland period in Kentucky offers current data on what the term "the Newtown phase/complex/tradition" (2000:625) means in Kentucky, while Seeman and Dancey's review of southern Ohio Late Woodland traditions incorporates discussion of some northern Kentucky sites (2000:595). Pollack and Henderson focus their study on either side of the Falls of the Ohio, which serves to demarcate two regions of Kentucky that appear to differ culturally, and which may have maintained distinct cultural traditions for a long period of time.

One of Pollack and Henderson's sub-regions is downstream of the Falls of the Ohio, and occupies the western portion of the state; the second sub-region, is upstream of the Falls and is in the eastern portion of the state. This eastern region encompasses the Middle Ohio River valley, the Central and Inner Bluegrass region, and the Knobs and mountains of Eastern Kentucky. Major rivers in the region include the Ohio, as well as its Kentucky tributaries (Kentucky, Licking, and Big Sandy), all of which are deeply entrenched with narrow flood plains. Within this region, only one cultural complex is well documented for the early Late Woodland sub period: the "Newtown phase/complex/tradition" (Pollack and Henderson 2000:625). Components associated with this phase are noted at several important Kentucky sites such as the Dreaming Creek site in Madison County, Hansen and Bentley sites in Greenup County, and the Pyles site in Mason County, as well as numerous smaller sites in the Bluegrass (e.g., Shelby Lake, Froman), and sites in the Eastern Coalfields such as Rock Bridge and Haystack rock shelters. Other Late Woodland cultural traditions (e.g., Beal's Run) in this region are only now being examined, since this period has typically been understudied (e.g., Pollack and Henderson 2000), so additional variation may be present that is only recently being documented.

Early and late Middle Woodland artifacts are very similar in most areas, but the late Middle Woodland tends to lack decorated ceramics. In Kentucky, early Late Woodland ceramics consist of subconoidal and subglobular cordmarked jars. Vessel rims are usually unmodified and lips are usually flattened and plain. Plain and cordmarked forms are common throughout Kentucky during the terminal Late Woodland sub period, but variation does exist. Pottery vessels with zones of incised geometric designs on the jar necks are found in the lower Ohio River valley. In far western Kentucky, during the terminal Late Woodland, pan-shaped vessels and red film surface treatment begins to appear although these types are diagnostic of the Mississippian period. In the Bluegrass Management Area, vessels with angular shoulders continue to be used (Applegate 2008).

In the terminal Late Woodland sub period, the 'true arrowheads' begin to appear in Kentucky (Applegate 2008). Point types found at Late Woodland sites, including several from dated contexts, are Jacks Reef (cal A.D. 442-776, cal A.D. 548-859 [Ahler 1987], and cal A.D. 675-938 [Ledbetter and O'Steen 1992]), Raccon (cal A.D. 663-1151 and cal A.D. 695-1223 [Ledbetter and O'Steen 1992]), Hamilton (cal A.D. 223-592 and cal A.D. 569-768 [Des Jean 2004]), and Levanna.

Wild animals and plants continued to be the mainstay of the subsistence strategy utilized during the early Late Woodland sub period. Cultivation of native plants continued and maize appears during the Middle and early Late Woodland contexts, but not as a significant source until the terminal Late

Woodland (ca. A.D. 800) (Applegate 2008). In Kentucky, maize cultivation appeared mostly in the Purchase and Green River management areas.

Regional variability dictated settlement patterns within the Late Woodland sub period. In the Pennyroyal Section, domestic structures included rectangular and circular single-post forms and possible Late Woodland wall trench structure (Applegate 2008). Late Woodland sites in the Bluegrass Management Area concentrated on upland ridges, while other areas continued a focus on floodplain zones. Two- and three-tiered settlement hierarchies have been documented in the Purchase Management Area during the terminal Late Woodland sub period. In contrast, nucleated settlements are more common in the early Late Woodland in central and northeastern Kentucky.

By A.D. 500, the construction of large earthen or stone enclosures had ceased. In contrast, construction of stone mounds increased during the Late Woodland. In western, southern, and parts of northern Kentucky, stone box grave cemeteries became common.

3.1.4 Late Prehistoric Period

Both the Mississippian and Fort Ancient cultural manifestations are widespread in the Midwest and are characterized by distinctive settlement patterns. Mississippian society is characterized by a hierarchical social organization, in contrast with the non-hierarchical social organization evident in Fort Ancient society. Examination of site structure, settlement pattern and mortuary behaviors confirm these distinctions. Generally, Mississippian and Fort Ancient cultures were spatially discrete. Mississippian societies are documented in western Kentucky, Illinois, and states further south, whereas Fort Ancient societies are documented from western West Virginia to southeastern Indiana and from south-central Ohio to north-central and eastern Kentucky (Griffin 1978:551). More specifically within Kentucky, Fort Ancient is present within the Salt River, Bluegrass, Big Sandy, and Upper Kentucky/Licking River management areas (Sharp 1990:467).

The Late Prehistoric period in the region is generally characterized by a Mississippian level of culture. Mississippian cultures are found primarily in the Mississippi Valley and parts of the Illinois and Ohio Valleys, although Mississippian influences are seen in a much larger geographic area. Prehistoric groups inhabiting these regions made shell-tempered pottery, constructed platform mounds, had settlements arranged in a hierarchical manner, were maize horticulturists, and had a political system that has generally been described as a chiefdom. Mississippian material culture is also characterized by artifacts associated with the Southern Ceremonial Complex (Jennings 1989:262-262). The origin of Mississippian groups has been viewed previously as migrations from a central heartland, such as Cahokia in the American Bottom of west-central Illinois (Smith 1984). More recently, Mississippian origins are increasingly seen as in situ developments (Smith 1984). Cultures with a similar level of development include Pisgah in the Appalachian Summit, Fort Ancient in the Middle Ohio River area, and the Plaquemine culture of the lower Mississippi River area. Although a Late Woodland level of society continued in the Midwest, the Great Lakes, the northeast and the piedmont, and coastal areas of the Middle Atlantic until European contact (Geier 1992:279-280), some contact is found at the boundaries between the Mississippian culture area and these regions. The Mississippian period is dated to 1,200 B.P. in the Middle Mississippi River Area. Between 1,100 and 650 B.P., independent Mississippian societies developed in the regions outlined above. These societies lasted until ca. 400 B.P.

Mississippian in Kentucky encompasses most of western Kentucky and southern Kentucky with the Fort Ancient culture covering the remainder. The Mississippian culture is well documented in western Kentucky with a well-established chronological sequence.

The Salt River Management Area includes sites that fall into both the Fort Ancient and Mississippian periods. Griffin (1978) and many other researchers believe that the Louisville area is the eastern border for Mississippian sites (Pollack 2008). Within the Salt River Area, Mississippian sites total 163, and 94.5 % of these sites were open habitations without mounds. Mississippian occupation of this area continued into the early 1400s (Pollack 2008).

Within the Green River Management, as of 2008, six hundred and five Mississippian sites have been recorded. Within the Pennyroyal Section of the Green River Management area, the most important Mississippian sites have been open habitation sites with and without mounds, such as the Williams site, the Glover site, the Page site, and Hadden site. Two phases were identified from this area, the Page Phase (A.D. 900-1100) and the Hadden Phase (A.D. 1100-1650). The Page site consisted of 67 recognizable mounds and eighteen of the well-preserved mounds were investigated (Webb and Funkhouser 1930). These mounds were determined to represent the remains of a cist-type mortuary facilities and ceramic assemblages were primarily tempered with limestone (Pollack 2008). The Hadden phase also represents primarily a mortuary complex, but has several other recognized components in addition to the Hadden site, such as the Dunklau site and the Martin Mound (Pollack 2008). This phase also consists of small mounds within which one or a few stone-lined burial features are present and ceramic assemblages were primarily tempered with crushed mussel shell (Allen 1977). However, little information is known about the social, political, and economic organization of the groups at these sites, and therefore, the label of 'phase' may be premature and the term 'mortuary complex' a better fit (Pollack 2008).

3.2 Historic Period

3.2.1 Exploration and Early Settlement (ca. 17th Century-1820)

It is not exactly known when the first Europeans entered Kentucky, but early explorers like Marquette and Jolliet certainly witnessed the western portion of Kentucky as they traveled the Mississippi and it's possible that La Salle may have visited the Ohio Valley. British exploration of the New and Holston rivers and stories from Native Americans led them across the mountains (Alvord 1920).

The Native American tribe that was first contacted by Europeans in Kentucky is believed to be the Shawnee (Turnbow 1980:17). It has been traditionally and historically maintained that the earliest routes into Kentucky followed buffalo and game trails frequented by Native Americans (Boisvert 1984:46-49, Brown 1929:4). It was quickly discovered by European Americans that these early trails were easy to follow and that they invariably led to salt and water.

The Native Americans of Kentucky and Tennessee were important to Europeans mainly because of Europe's insatiable desire for animal skins and furs. French and English traders became a common sight along Kentucky and Tennessee's Indian trails after 1673 (Bergeron 1999). French traders operated from posts along the Mississippi and possible as far south as Nashville, Tennessee by 1714(McBride and McBride 2008). Therefore, small private posts may have been located within western Kentucky, but there is no evidence of such activity.

Important early routes into Kentucky went overland through the Cumberland Gap, while a major water route proceeded down the Monongahela River, then the Ohio River. The exploration and the ultimate European American settlement of Kentucky began in earnest in 1750 when Dr. Thomas Walker explored some of eastern Kentucky. Walker's party reached the confluence of the Red and Kentucky Rivers. He was followed in rapid succession by a number of other Englishmen: Christopher Gist in 1751, John Finley in 1752, and Daniel Boone in 1769. In 1775, Boone established the first permanent European American settlement in Kentucky at Boonesborough in Madison County. Both the overland and water routes were considered dangerous during the eighteenth century due to intermittent Indian attacks.

By the late 1760s, "Long Hunters" from the eastern United States were venturing into the area via the Cumberland Gap (McBride and McBride 1990:587). Daniel Boone, negotiating with the Cherokee, built the Wilderness Road, which became the primary overland route through Kentucky from 1775 to 1818 (Ison et al. 1991:11). The Wilderness Road passed through the Gap, down Yellow Creek, through the Little Log Mountain gap, on through Ferndale, up Moore's Branch, through the Big Log Mountain gap, through the "Narrows" south of Pineville, through Cumberland Ford in Pineville, past the Cumberland River to Flat Lick, and finally on to Boonesborough (Fuson 1947). An earlier traveler's account described the land after passing through the Gap:

> *"From thence (from Cumberland Gap) until you pass Rockcastle River there is very little good road; this tract of country is very mountainous, and badly watered along the trace, especially for springs. There is some good land on the water-courses, and just on this side Cumberland River appears to be a good trace, and within a few years I expect to have a settlement on it. Some parts of the road is very miry in rainy weather. The fords of Cumberland and Rockcastle are both good unless the waters be too high." (William Brown in 1782, Fuson 1947:2).*

In 1765 and again in 1770, Henry Scaggs passed through Cumberland Gap and explored the bluffs where Nashville now stands. In the next four years, parties led by James Smith, Kasper Mansker, and Isaac Bledsoe extensively explored this region. One of the parties found Timothe DeMonbreun, an Illinois Frenchman, operating a trading post in a cave on the Cumberland River. In 1777, DeMonbreun founded a settlement of seven individuals on the Cumberland River near what would become Palmyra (Autry and Hinshaw 1978). While the Revolutionary War was going on in the East, the migration of settlers into Middle Tennessee began and Nashboro was founded in 1780. Kentucky saw similar exploration as 'long hunters' explored many river valleys including the Kentucky, Licking, Cumberland, Green and used many Indian and buffalo trails. While the country south of the Green River was slow to be settled, other regions of Kentucky, particularly the central Bluegrass area, saw increased settlement and establishment of small towns.

The project area lies within the Pennyrile, and Martin (1988) has defined the Pennyrile as having about five sub regions based on varying soil types, minerals, navigable rivers, and overall terrain. A smaller subarea of the Pennyrile became known as the Black Patch, an agricultural area in southwestern Kentucky and northern Tennessee historically and economically shaped by its dependence on dark-fired tobacco. Before the development of the Pennyrile and the Black Patch, the frontier south of the Green River was known as a poor man's country, suitable for homesteaders and farmers eager to start a new life in the trans- Appalachian West. Our study encompasses that area of Kentucky called the Green River Country, lands in western Kentucky south of the Green River, which opened for settlement in the late eighteenth century (Figure 3-1). Sometimes called "Southside," the land south of the Green River includes Logan County, where the current project is located.

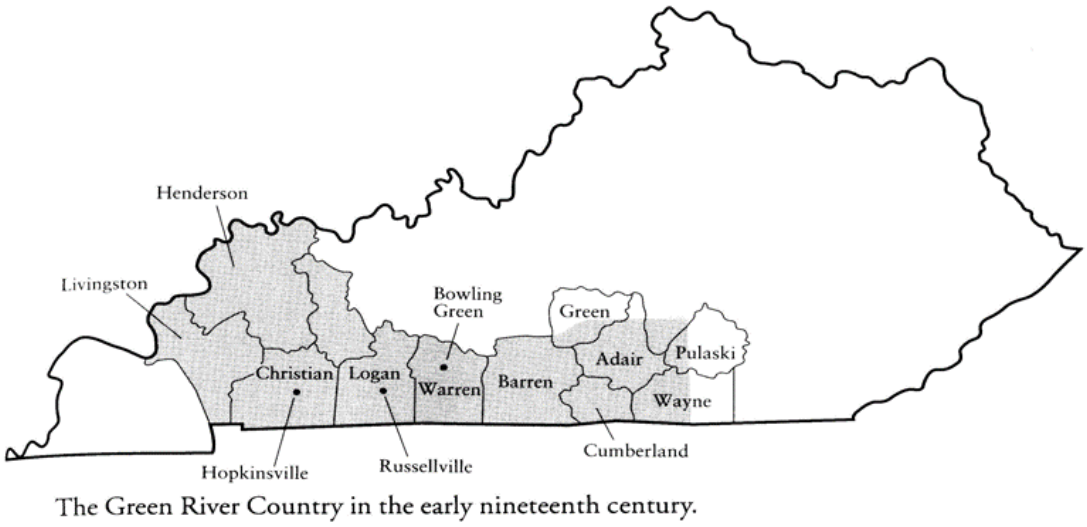

Figure 3-1. Green River Country (Aron 1996).

Probably the earliest settlements in the Green River Country consisted of stations where groups of families would settle together for mutual support. Frontier stations were the cultural and political centers for early settlers from 1780-1795 and were significant to the growth, development, and defense of the study area. While built for both defensive and domestic purposes, these fortified stations provided protection during Indian attacks. The establishment of eight stations in Middle Tennessee by 1780 was fundamental to the development of the area. These stations included Nashborough, Mansker, Bledsoe, Ascher, Freelands, Eaton, and Fort Union, and through these stations, the Cumberland Compact was

formed (Albright 1908; Perkins 1998; Rogers 1977). One important duty of this compact was the supervision and settling of land claims disputes, which proved important to the development of the area as a whole.

Although the federal government had extended its protection to the Tennessee-Kentucky territory, the threat of the Indian attacks was still great and often instigated by the Spanish at least until 1795. The exportation of goods down the river to New Orleans was very important to the economic development of the Green River Country in Kentucky and Middle Tennessee as well, but navigation was controlled by the Spanish. The Spanish wanted the settlers' limited navigation rights to the Mississippi if they did so. Although the Spanish had hoped to exert some influence over areas in Tennessee and Kentucky, they were unsuccessful. On May 20, 1790, the Cumberland Settlements were included within the limits of the Southwest Territory and came under the jurisdiction of the federal government, which were protected by military posts and organized militia (Albright 1908; Rogers 1977:7).

The western portion of Kentucky that included Logan County was settled more slowly than other parts of the state because of the continued Indian attacks and closure of the Mississippi River by the Spanish that made settlement and commerce impossible. Throughout Isaac Shelby's first term as governor (1792-1795) he received requests for protection from Indians from all over Kentucky (Teute 1988). A Logan County spokesman reported to Shelby, "I am really afraid our Upper Settlements will be oblig'd to abandon their homes the consequence of which will be the loss of our corps that will in great measure depopulate this part of the county" (cited in Teute 1988: 196). Arthur Hopkins writing in 1795 informed his cousin John Breckinridge that he had been unable to explore the country between the Green and Cumberland Rivers because of Indian attacks (Teute 1988: 196). Some of the earliest settlements below the Green River consisted of isolated stations along the Cumberland and Red Rivers. Stations in the Cumberland/Red River area included Prince's, established in 1782 about 100 yards from Cave Springs near the junction of Sulphur Fork and Red River; Neville's established about 1784 on the Red River between Clarksville and Prince's Station; and Clarksville, established in 1784 as a blockhouse on the Cumberland River (Battle and Perrin 1884; Beach 1964). Morton Maulding followed Kasper Mansker into the Red River area, and between 1780 and 1782, he established Maulding Station on the Red River in what would later be Logan County (Richardson 1992). Indian attacks, however, caused Maulding to relocate to Big Boiling Springs (Russellville) in 1782. After 1790, when the threat of Indian attack had diminished, small villages began to appear and flourish (Beach 1964; Perrin 1884; Teute 1988; Waldrep 1999).

Newcomers to the Green River Country were culturally a homogenous lot from the Piedmont of Virginia and North Carolina (Marshall 1994; Winters 1994). Visitors to the south of the Green River disparaged the "barren" land, and bad reports concerning the fertility of the soil and suitability for agriculture discouraged the rush of settlers that flocked to the trans-Appalachian West. Yet another factory to slow settlement was the continued rampant land speculation in Kentucky. These practices acted to discourage serious farmers and much of the land was bought up by speculators, who as absentee owners, were primarily concerned with profits and not long-term development of the land. Attempts were made in the 1790s to alleviate this system, at least in some southern counties in Kentucky. Properties in the Green River territory, near the Red River, and in the "barrens" were denied sale to speculators. Only 200 or 400 acre tracts could be sold at once and these were sold at a reduced rate to homesteaders.

By the 1790s, the Green River Country, variously known as the Barrens and the Southside, became Kentucky's best poor man's country. Settlers came from rural settings in Virginia and North Carolina,

where their ancestors had long engaged in agriculture as members of farming households (Winters 1994:13). In June of 1792, Kentucky was granted statehood, becoming the 15th state in the Union. Logan County was formed in September of that year, and at this time, it went from the Little Barren River on the east to the Mississippi River on the west and from the Ohio and Green Rivers on the north to Tennessee on the south (Richardson 1992). It would later be split into an additional twenty-eight counties.

In December 1800, a new homestead act 'for further settling and improving the vacant lands of Kentucky's permitted free persons to preempt up to 400 acres. Green River homesteaders who had claimed under the old limits were allowed to appropriate an additional 200 acres. Increasing the preemption limits, however, presaged the emergence of large landowners-speculators and absentee landowners in the study area (Aron 1996). According to Aron (1996:164) by 1810 better than one in ten landowners held more than 1,000 acres with six landowners having acquired more than 10,000 acres.

Speculators in the Green River Country during the early nineteenth century profited handsomely from their land acquisitions. Those who bought land at the state's price could ask and receive a hefty price per acre after preemption limits increased. Speculators who owned land in the Barrens could make higher profits especially after the fertility of the Barrens was realized and land prices soared. According to Aron (1996) landowners in Logan and Christian Counties sought up to eight to ten dollars per acre for barely improved tracts of land in 1817. After 1810, as the population increased in the Green River County so did landowners and acreage amounts per landowner. Within population of Logan County, landownership increased throughout the early nineteenth century.

In 1792, almost 70% of the population in Logan County owned no land at all, and were probably squatters or had not staked claims. Most landowners owned less than 300 acres. Very few people owned more than 1,000 acres. Some eight years later, changes had occurred in the distribution of land, reflecting in-migration, and various legislative efforts to distribute vacant land. Less than one third of the population owned no land at all, a significance decline, whereas another third owned between 200 and 300 acres. About 20% owned less than 200 acres, and about 13% owned more than 300 acres, although the proportion owning more than 1,000 acres had not increased significantly. By 1810, some more changes had occurred; about the same proportion of the population owned no land, or owned between one and 200 acres. The proportion of the population owned more than 200 acres had declined dramatically, from 32% in 1800 to 15% in 1810. Land apparently was sold to larger land owners, who consolidated holdings into larger farms. In 1810, the proportion owning 300 to 1000 acres had almost doubled, and the proportion owning more than one thousand acres had increased almost fourfold. Economic decline in the 1820s, however, appears, to have led to some redistribution of land. By 1825, the proportion of small landowners (owning less than 200 acres) had increased by about 10% and the number of the large landowners (with more than 300 acres) had declined by about 7%. This redistribution affected all landowners.

A combination of factors led to a unique economic history in the counties south of the Green River. While early agriculture was dominated by mixed or diversified farming practices and subsistence oriented agriculture, a reliance on dark-fired tobacco as a leading commodity for export also developed. The tobacco boon not only fueled land prices, but also enabled the growth of a diversified economy in the Green River Country. Small farmsteads and crossroad communities or trading centers developed as did large retail centers like Russellville, Owensboro, Clarksville, Hopkinsville, and Nashville. Early nineteenth century maps of the region show villages, towns, and roads connecting the region to Nashville, Lexington, and the Ohio River (Figure 3-2). Tobacco and other agricultural products were

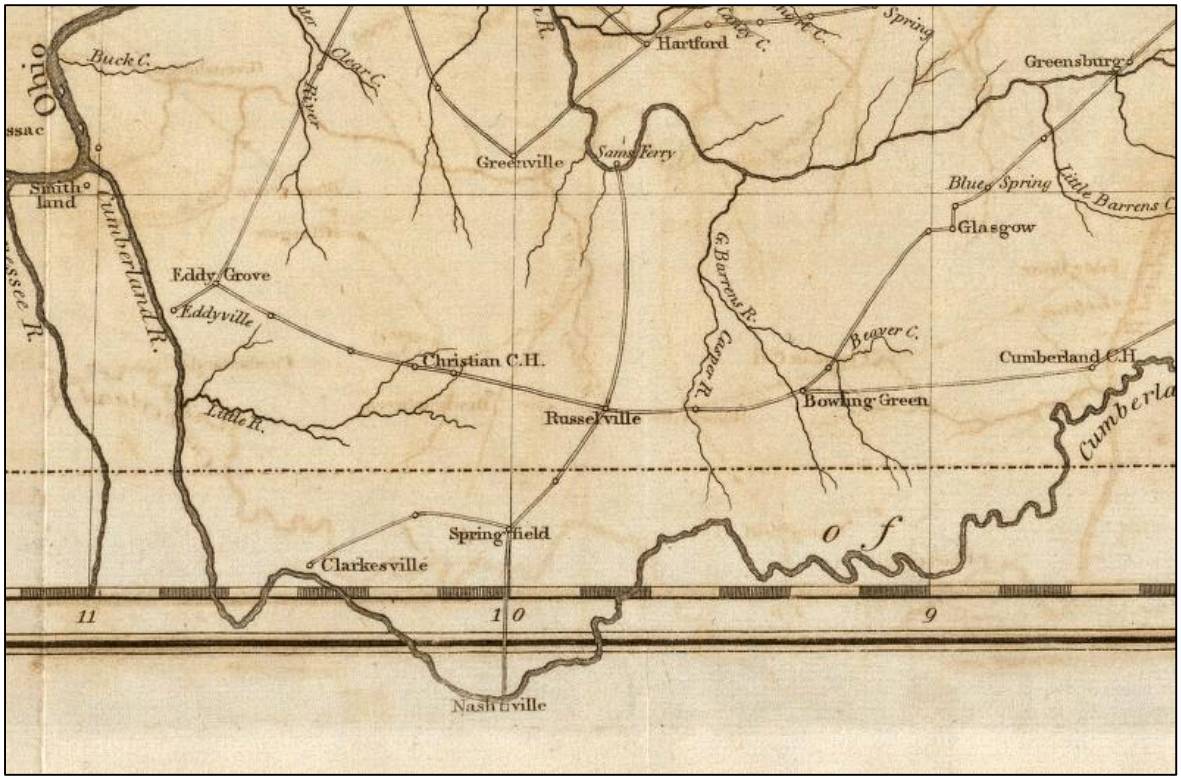

Figure 3-2. 1812 Map of Kentucky (Melish 1812).

gathered at large retail centers for export to national and international markets. Farmsteads and plantations tended to occur together on the landscape forming small commercially-oriented neighborhoods or hamlets where mills, tanneries, distilleries, and blacksmiths were located.

The Green River Country generally lacked the quality of soil needed to raise hemp as successfully as the Bluegrass, but the Southside's soil and climate were ideally suited for the cultivation of tobacco. Green River growers pioneered the development of new strains of Burley leaf, which closely resembled that of the James River area. Many counties in the Pennyrile possessed soil with the essential physical and chemical properties that made possible growth of the dark, rich, heavy leaf so eagerly sought in the European market (Marshall 1994; Winters 1994). At first, tobacco was grown in small patches, providing only for local or family needs. As more lands were cleared, extensive planting occurred. Cultivation was profitable and virgin soils produced a satisfactory crop with little labor. After the War of 1812, the superior quality tobacco from the Southside sold for three times the price of tobacco grown in the Bluegrass (Aron 1996:166). High tobacco prices also fueled planter-speculators as land values increased throughout the early nineteenth century.

The commercialization of the region's economy was the result of increases in agricultural production resulting from diversification coupled with the profitable specialization in dark-fired tobacco, increasing diversification in manufacturing and services, the growth of small towns as local trading centers as local trading centers, and improved trade connections with New Orleans, Nashville, Lexington, and cities in the East. Towns that experience the most growth offered larger, more diverse markets for trade opportunities and were usually on rivers or prominent overland routes. As coastal markets vied for access to inland produce or mineral resources, the state was motivated to improve transportation. Towns grew up at major crossroads, stream crossings or mill sites. As new counties were formed,

county-seat towns (Tolbert 1999) were established, providing markets for farm products and nodes for trade networks.

Towns in the tobacco-growing Barrens enlarged substantially throughout the early nineteenth century. Glasgow, Bowling Green, Hopkinsville, and, most of all, Russellville, emerged as leading mercantile centers. So great was Russellville's economic growth that its mercantile community fancied the town "the Lexington of the Green River" (Aron 1996:167). Russellville formed at the crossroads of many overland routes by 1790 and would later be named the county seat of Logan County (Richardson 1992). Founded near a large spring, the town was originally named Big Boiling Spring. After having the names, Gasper Butcher's Spring, Cook's Spring, and Logan Court House; the name Russellville was chosen. The town grew rapidly in the years before 1830 to become an important mercantile community and retail center. The presence of five major turnpikes and wagon roads connecting Russellville to the Nashville Basin, Hopkinsville, Bowling Green, and Greenville in 1822 suggests that integrated market systems were well entrenched in the area by the early nineteenth century (Figure 3-3). In fact, Russellville was probably the third most important business town in the state in 1810 (Coffman 1962:127). In 1810, Russellville had a powder mill, a paper mill, a chair factory, a bagging and cordage factory, a rope walk, three potteries, three hatteries, two furniture factories, two wagon and vehicle factories, three linseed oil mills, one castor oil mill, a shoe factory, a nail factory, three salt manufactories, four tan yards, four tailor shops, two saddle and harness factories, a broomery, two lime kilns, and three brick kilns (Coffman 1962:127). The overwhelming prosperity of the early nineteenth century in the Green River Country was to change by the 1820s, however.

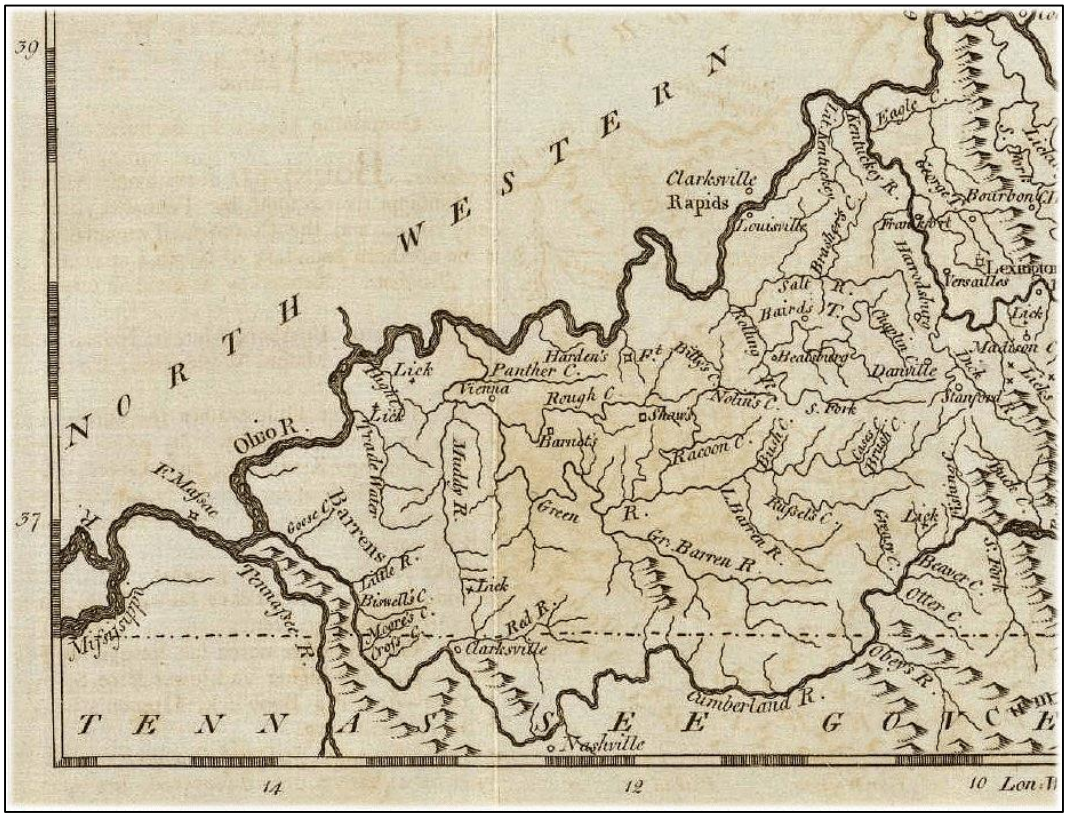

Figure 3-3. Kentucky in 1796 (Barker 1796).

3.2.2 Antebellum (1820-1861)

Economic development slowed during the 1820s in Kentucky and Tennessee. By the 1820s, the study area was in the middle of a depression, which affected merchants, agriculturalists, and industrialists. Several towns established in the post-war boom time after 1812 failed from this depression (McBride and McBride 1990). The expansion of the economy that occurred after 1812 was literally cut short by financial collapse. In 1818, the national bank, fearful of the rapid expansion and the concomitant inflation, inaugurated a policy of retrenchment and contraction by calling in loans around the country (Bergeron 1999). The impact was immediate and devastating: businesses collapsed, commodity prices (i.e., cotton) plummeted, and banks ceased specie payments. The Panic of 1819 had begun and it was not until 1825 that the region began to experience the return of prosperity. Developing transportation systems and towns sputtered with the economy during the 1820s. As the nation began to recover, so did economic development and commerce as prices for agricultural and industrial goods increased (McBride and McBride 1990). Although recovery was sure and steady, the rapid growth experienced by the region after 1812 was never duplicated. In fact, Coffman (1962) suggests that the area began to decline after 1830 and it was not until after the Civil War that the region became prosperous again.

The Pennyrile and its sub region, the Green River Country, remained overwhelmingly agricultural for more than two centuries despite increased commercialism and concomitant population growth within towns and urban centers. The sub-regional farming patterns that had developed by the 1820s and 1830s remained essentially in place well into the twentieth century. In the western section of the Pennyrile lay the center of the dark-fired tobacco belt (Martin 1988). While tobacco received the most attention, it was rotated with other crops: corn, hay, and especially wheat, to maximize yields. Wheat production was higher in these counties than in other sub regions. Small grains contributed to the household's diet. Most farmers planted wheat for household consumption as wheat cultivation was both riskier and a less efficient use of the soil than corn cultivation. Wheat flour became something of a luxury item and was occasionally used to barter for services or other foodstuffs. Households often reserved some wheat for breads, biscuits, or pastries. Many farmers in the Upland South, in general, raised barley, rye, oats, and buckwheat, but these small grains were less common in the rural diet that wheat (Winters 1994:31). Households would grind the four grains together to form a base for breads, muffins, and pancakes (Winters 1994).

During the late eighteenth and nineteenth centuries, a ccording to Friend (1999:138), the pursuit of profit strongly influenced the production of corn. Its production dominated rudimentary commercial or marketing activity in Kentucky and Tennessee and became imbedded in the state's economy. Although settlers consumed most of their corn crops, money could be made from raising and either bartering or selling corn, grinding corn, marketing cornmeal, or distilling whiskey (Friend 1999; Otto 1989; Winters 1994). Although the success of corn cultivation raised expectations of profit among farmers, household production was important to the total success of the farm. Corn was unequaled in household consumption, appearing in some form or another at every meal on most nineteenth-century dinner tables. Early nutritionists even believed corn to be of higher nutritional value than wheat (Hardeman 1981). Besides household consumption, corn was important as livestock feed. In an endless cycle, horses, mules, and oxen helped produce corn and corn in turn fed horses, mules, and oxen. Nearly half the nutritional value of the corn was in the plant itself (leaves, stalks, husks, and cobs) and fodder was heavily relied upon to feed livestock. Since corn was a labor intensive crop, tobacco farmers planted it in inverse proportion to the tobacco grown (Martin 1988:6).

Livestock were important to the diversified farmer of Kentucky and Tennessee. Livestock held both premarket and market value. Livestock were important for profit on the open market, served as

sustenance to the family, and provided labor. Nearly all farms had domesticated stock. Horses and mules were used for drafting, milk cows for meat and dairy products, hogs for meat, and sheep for wool and meat. Much stock, however, was kept for sale or trade. Kentucky was especially adapted to the production of livestock with limestone rich soils that helped to develop large and strong bones in animals, fair weather for grazing, and an abundance of pastureland (Martin 1988). An added factor was that livestock could transport themselves, while other products needed to be transported by wagon or boat.

Hogs and mules were often transported to out-of-state markets. In 1810 and 1811, between 40,000 and 70,000 hogs were driven east over the mountains, while 27,642 barrels of salted pork were shipped to southern plantations (Martin 1988:15). The Pennyrile was a principle hog- producing area. In 1850, the Pennyrile produced 40% of the state's total hog production with farms in Logan, Christian, and Warren counties averaging 50 hogs per farm (Martin 1988:15-16). Mules, introduced to the state in 1780, became an important export to southern markets although by special mule breeders. Most farms, however, had at least two mules used for plowing and other draft work (Martin 1988).

Livestock provided yet another source of cash income for antebellum farmers. They often sold hogs or pork products to local merchants or others in the community. Products ranged from sides of bacon to barrels of lard. Pigs on the hoof offered another avenue for commercial sales. Drovers purchased or received on consignment, livestock from farmers as they moved through the state, late in the year after the swine had been fattened on corn (Martin 1988; Winters 1994). The size of the drives varied from three hundred to more than one thousand animals, and those crossing Middle Tennessee were often destined for markets in the Gulf Coast states.

Sheep was also an important animal to the Green River Country. Between 1840 and 1860, Kentucky ranked first in domestic manufacturing, most of which was the production of fabric (Martin 1988). Even in the early nineteenth century, cloth production was an important activity in Logan, Warren, and Barren Counties in particular. A list of manufacturers compiled by Tench Cox in 1814 shows that Logan County produced blended and unnamed cloths and stuffs valued at $104,106.00 for that year utilizing 552 looms. Warren County possessed 994 looms and produced $63,469.00 worth of cloth. The Pennyrile was an important sheep producing region throughout the nineteenth century with 408,468 sheep in the Pennyrile alone in 1850, approximately 40% of the state's total (Martin 1988).

The flexibility of mixed or diversified farming enabled farmers to vary the suite of crops in response to price changes and to protect themselves from sudden drops in the price of commodities like tobacco. Market crops were only a part of this farming system that included other grains, grasses, fruits, vegetables, livestock, and animal products that provided for the household, supported livestock, paid for local services (i.e., grist milling) and labor, and provided income from sales in local markets (Friend 1999; Schlotterbeck 1982; Winters 1994). Purchasing produce and household-produced goods from farmers to sell in their general stores was common for local merchants, and it benefitted both the farmer and the merchant. Such products included apple cider, butter, candles, cloth, honey, distilled whiskey, maple sugar, salted or smoked pork, and tobacco (Martin 1988; Winters 1994). Local processors also bought produce from farmers. Farmers even took advantage of selling produce to people passing through; drovers herding their livestock to market needed feed and pasture (Winters 1994).

Tobacco was the prime commercial crop by the beginning of the nineteenth century. Cultivation of tobacco, however, demanded an enormous amount of physical effort. Small farmers with a commercial orientation elected to cultivate tobacco, providing they had access to an adequate labor supply. Large farmers to be sure cultivated the crop, but small farmers could also profit from growing tobacco. The success of tobacco coupled with the advance of speculator-planters to the Green River Country

increased the number of slave owners and slaves in the region. In Logan County, the percentage of slave owners doubled during the first quarter of the nineteenth century (Aron 1996:164). By 1825, better than two out of five householders acquired at least one slave. According to Aron (1996:164-165), the number of slaves in the Green River Country was increasing much faster than the region's white population. Census data for the years 1800 through 1850 shows that the number of slaves within Logan County increased from 775 in 1800 to 9,643 by 1810.

As the number of slaves increased in the Pennyrile during the early nineteenth century, the percentage of slave populations grew dramatically in some counties. In Logan County, the slave population grew from 13% of its aggregate population in 1800 to 35% by 1840 (Lamon 1981). In Christian County, the slave population grew from 28% of the aggregate population in 1820 to 38% in 1840 and 46% in 1860 (Martin 1988:210-212). Even in Trigg County, where farms were smaller, the slave population in 1860 was 31% of the aggregate population (Martin 1988:212). In Middle Tennessee, crops of tobacco and corn were increasingly tended by slaves. Entrepreneurs such as Montgomery Bell and Elias W. Napier used slave labor extensively in developing a cluster of iron furnaces in the area (Lamon 1981:10). Although slave labor is usually associated with agriculture, bondsmen and women were used in a variety of activities, such as laborers at iron or salt works, stone fence building, blacksmithing, shoemaking, weaving, and woodworking (Martin 1988).

Hiring slaves out for work was one characteristic of the region's economy. The demand for cheap labor fueled the continued need for slaves. Slaves were also considered wealth and were valued more than land in many areas of Kentucky. According to Waldrep (1999:160), slaveholding made a difference in the calculation of wealth, doubling and even tripling estate inventories. Next to hard cash, slaves were the most valuable commodity in early Kentucky (Teute 1988:195). Residents regularly advised prospective settlers to dispose of all their property back home and invest in slaves and specie (Teute 1988). John Breckinridge assured his brother "to purchase all the negroes you possibly can and bring them here. They are of great value here... They also sell high" (cited in Teute 1988). While many early landlords rented land to white tenants to improve for them, slaves were used in more lucrative endeavors, particularly in manufacturing and hiring out to manufacturers (Aron 1996). Interestingly, white tenants were invaluable to large landowners in the Green River Country since they cleared the frontier, increased the productivity of the land, planted the first crops, and they freed slave labor for those more lucrative endeavors (Teute 1988:195). In a cash-poor economy, hard cash to pay white laborers was hard to come by. In hiring out slaves for cash and paying white tenants in crops and a place to live, the landowner had the best of both worlds. This strategy of land improvement was practiced in the Green River Country and throughout Kentucky during early settlement. While profitable, slave owning seems to have also enhanced political opportunities. Waldrep (1999:160) found that migrants into Kentucky who achieved any kind of political leadership status usually owned slaves and had brought them with them to the frontier. By 1820, however, most of the original western Kentucky settlers owned slaves.

To permit commodities to flow to distribution and consumption centers, an integrated transportation system was present by 1830, including steamboat travel and overland roads and turnpikes. Throughout most of the early nineteenth century, rivers comprised a dominant medium for accomplishing interregional trade. Along these waterways, many small communities became landings for commercial activity and boat construction. Hundreds of local ferries played a crucial role in the flow of commodities from inland areas to the major river systems. As the staging areas for down-river flatboat movements, ferries were often collection points for agricultural or extractive exports and for the redistribution of goods. Ferry sites, as connectors between wagon roads and water transportation,

stimulated the emergence of adjacent inns, warehouses, stores, and manufactories (Dunaway 1996; Schlotterbeck 1982). People chose to site their dwellings and communities near the many creeks and rivers because streams were the chief transportation corridors and the surrounding fertile land was used for agriculture. In addition, flowing water provided power for grinding corn or wheat and sawing lumber. Milling operations were important to the inhabitants of the study area due to their ability to convert crops into a marketable form.

Economic growth in the Green River Country was dependent upon internal improvements. Internal improvements were needed to insure that commodities and produce reached markets and bulking centers on rivers for transport to New Orleans and cities in the East, and that imported goods were available to residents of the region. The early County Court assumed responsibility for authorizing such improvements as roads, bridges, and ferries. To finance these, citizen labor was used and tolls were charged. A commissioner was appointed to have the road cleared between specified terminal points, opened for use, and kept in repair by men of the community served by the road. Later, companies of stockholders financed road construction in preferred locations, but seldom did these companies prove profitable (Beach 1964, 1988; Perrin 1994, 1884). Although Middle Tennessee deemed improvement of the Cumberland River to be a vital matter, it benefitted Kentucky farmers also. Those in the Green River Country had access to the Cumberland River through Clarksville. The Tennessee legislature appropriated $135,000 during 1832-1837 for Cumberland River improvements (Beach 1964:96). Successful use of the Cumberland by steamboats meant more merchandise brought to wharves and landings for internal distribution in the region via turnpikes and wagon roads.

Turnpikes were not the first roads to be built in the region. Between 1799 and 1802, laborers had hacked a wagon road through the forest from the mountains of East Tennessee to Nashville, thus connecting Middle Tennessee and the Green River Country to the East via overland routes (Albright 1908; Bergeron 1999; Tolbert 1999).

Turnpikes and wagon roads served to connect the inland with waterways. Waterways were used for rapid transportation of agricultural, extractive, or manufactured commodities out of the study area. Several types of river craft were used on the region's major waterways. For one-way transport of goods down river, local companies or individuals constructed flatboats, tobacco canoes, Kentucky boats, and bateau. For round-trip travel, exporters and travelers relied on keel boats or packet boats and -- after 1830 on the Cumberland River -- the more versatile steamboat. Flatboats and horse or rope propelled boats carried goods from shallow tributaries and ferries to intermediate sites for transfer to larger packets or steamboats. Export by river was structured, however, and required skilled specialists for movement down-river to the large international trading centers like New Orleans. River wharves, landings, and warehouses were owned and operated by companies that accepted goods on consignment for transport to distant markets. Clarksville is a prime example of a bulking center where goods were stored in warehouses awaiting shipment. Russellville was a smaller retail and trade center that had direct dealings with the Nashville Basin and Clarksville in particular (Martin 1988). Connecting to these waterways, several networks of state turnpikes and county roads linked the communities of Middle Tennessee and southwestern Kentucky into national commodity chains (Dunaway 1996). Several major thoroughfares crossed the region carrying livestock droves and trade goods to distant markets in other areas. As Figure 3-4 shows, Russellville was connected via a system of turnpikes to Nashville, Clarksville, Hopkinsville, Cadiz, Bowling Green, and Glasgow. Easy access to the Cumberland, Ohio, and Mississippi Rivers was gained through Clarksville, Cadiz, Owensboro, and Nashville, where markets in New Orleans could be tapped. Overland routes connected Russellville to important cities like Lexington and eventually cities in the East.

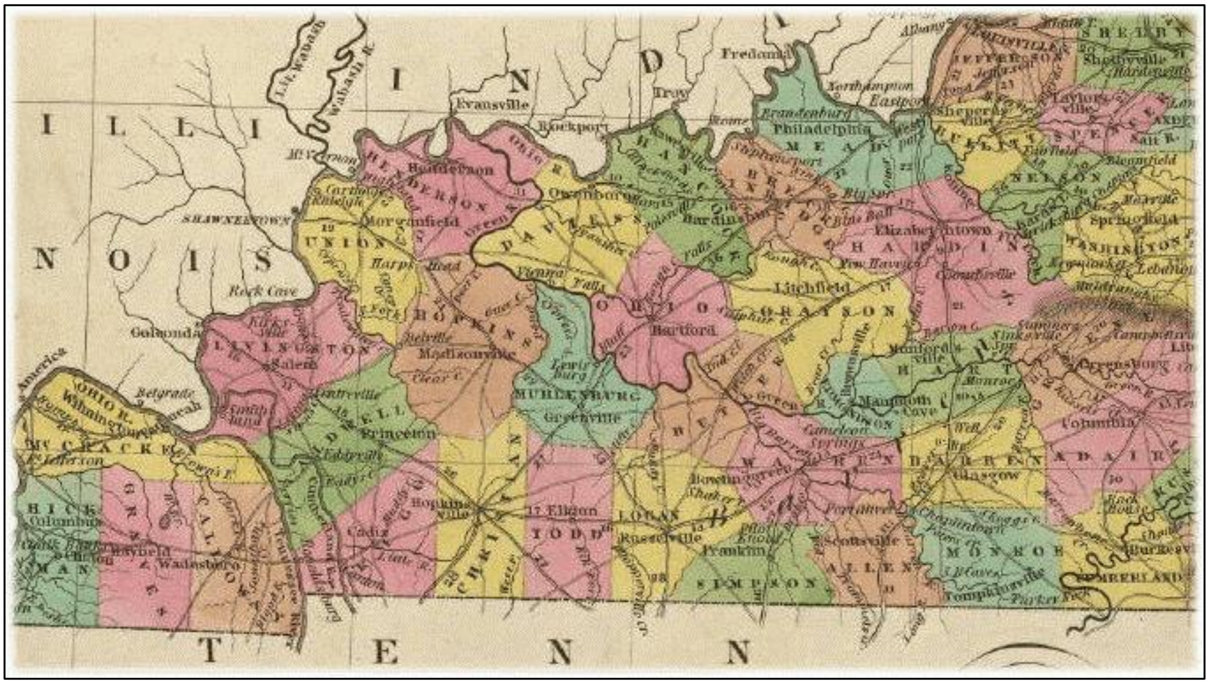

Figure 3-4. 1836 Map of Kentucky (Tanner 1836).

Integrated trade centers and commodity routes provide a base for settlement systems and community formation. Linkages with national and global markets suggest that the area's inhabitants had access to all manners of material goods by the early nineteenth century. Access to goods allowed the residents of the region to participate in the consumer revolution and class-based Victorian society prevalent during the nineteenth century. To what extent this participation occurred depended on fashion, purchasing power, economic class, ethnicity, and even gender

3.2.3 Civil War (1861-1865)

Kentucky's status as a border state not fully joining the Confederacy but yet still allowing slavery brought division within the population. The Union Army headquarters for Kentucky were at Louisville and Camp Nelson in Jessamine County which was a large quartermaster depot and African–American recruitment center that operated from 1863 to 1865. The fort employed over 2,000 civilian employees, and housed between 900 and 5,000 troops at any time (McBride et al. 2003).

The Battle of Perryville, the largest Civil War battle to occur in Kentucky, was fought near Perryville in Boyle County. On October 8, 1862, the battle ensued, involving 16,000 Confederate troops and 58,000 Union troops. The Confederate force was defeated and they retreated to Tennessee, and the three-month long Confederate effort to secure Kentucky was halted (Kleber 1992).

The economic effects of the Civil War were probably more significant to people in Kentucky than the physical devastation. Many farmers and merchants were hurt by the curtailment of trade with the south (McBride and McBride 1990:609). The hemp industry, which was already declining in the 1850's, lost its most significant domestic market, the southern cotton producers (Hopkins 1998:68). There were also transportation system disruptions due to war damage or to Union control.

The three largest factors in the deterioration of Kentucky's agriculture and industry during this time were the loss of the labor force, the loss of the market at New Orleans, and the major drought across the

region that lasted from 1860 to 1863. About 100,000 Kentucky men entered the Union Army and up to 40,000 entered the Confederate Army (McBride and McBride 1990:610). Almost one third of those enlisted died. With the help of individuals like Delia Webster, slaves escaped across the Ohio River in the early years of the war. In 1864 the U.S. Government granted freedom to any slave that enlisted in the U.S. Army. The male slaves also brought their families to the encampments (McBride et al. 2003).

Within the Green River Country and Logan County specifically, the Civil War brought divisions among families. This portion of the state was occupied by the Confederate forces by late summer of 1861 as the northern part was with Union troops (Brown 2000). A conference was held in Russellville in late October of 1861, which led to the declaration that Kentucky was absolved from allegiance to the United States on November 20, 1861 (Brown 2000). However, this Kentucky Confederate government only had power over southern parts of the state within Confederate lines, and the fall of Fort Henry on February 6, 1862 and the Union attack on Fort Donelson on the Cumberland River weakened the Confederate stand in Kentucky. In and around Bowling Green, the Confederates began to evacuate on February 11 and most were in Nashville by February 15.

Around 1,000 men were furnished to the Confederacy from the Logan County, including Company A of the 9th Kentucky infantry, and about 500 soldiers were also recruited to the Union Army (Richardson 1992). No major battles occurred within the county, but the Louisville and Nashville Railroad was often damaged and runs through the county. Figure 3-5 shows the area of Logan County in 1863.

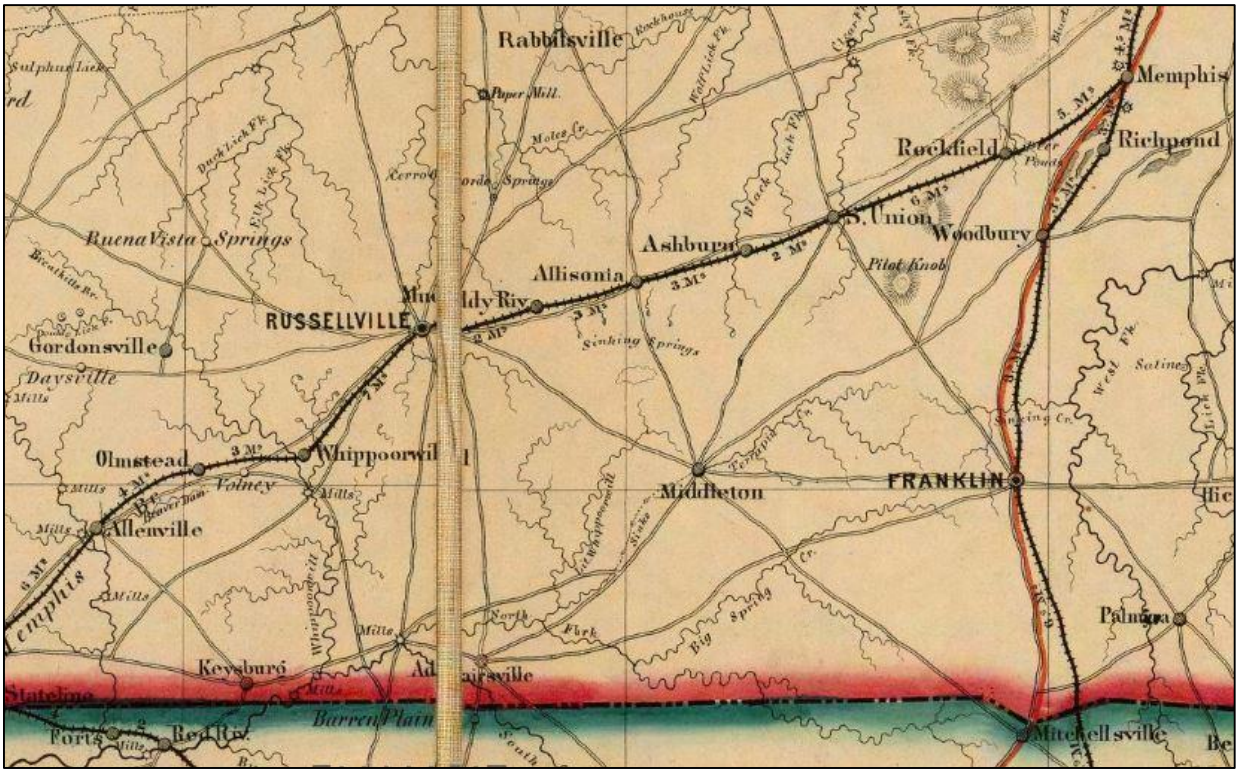

Figure 3-5. Logan County in 1863 (Swann 1863).

3.2.4 Postbellum Industrialization (1865-1914)

There were changes in social and economic systems that greatly affected Kentucky during the postbellum period (McBride and McBride 1990:615). During this period the state began to deal with the emancipation of African-Americans and their role in the society. The agricultural system began to

change with the introduction of white burley tobacco (McBride and McBride 1990:615). There were significant developments in communication and transportation, growth in industry and commerce and increased urbanization (McBride and McBride 1990:615).

After the war, agriculture and manufacturing recovered and expanded. Former slaves took agricultural or industrial jobs for pay. Many hamlets grew up around farms and also in urban areas that were populated by the recently freed African-Americans. Markets in the south opened up again. The hemp industry revived after the war and again became a major crop and industry (Hopkins 1998). However, the production of tobacco gradually increased and would eventually overtake hemp as the most important cash crop in Kentucky.

Despite all these hardships, by 1870, Kentucky was first in hemp production, third in the production of mules, fifth in the production of swine, and eight in the production of corn, wheat, and flax (Axton 1975; Tapp and Klotter 1977). Tobacco production increased more than 70% from 1870 to 1900 in Kentucky (Tapp and Klotter 1977). Kentucky benefited from the fact that less damage occurred within the state in comparison to other states during the Civil War.

It was in 1871 that the Kentucky Central Railroad (later the Louisville and Nashville and currently TTI Railroad) connected into Carlisle, supporting the tobacco and industrial markets and demands. The 1893 railroad depot still stands, and has been restored as a museum. (Conley 1992b:163).

Mass production and a growing desire for consumer goods stimulated retail trade and the growth of most cities and towns throughout Kentucky during this period. The availability of mass-produced goods led to a general decline in local manufacturing and the consolidation of small manufacturing operations. The decline in local industries also may have resulted in the rural to urban migration (McBride and McBride 2008:948).

3.2.5 Twentieth Century

The beginning of this period was very similar to the previous period. Kentucky was still a leader among the southern states in agricultural products and a continued production pattern in industrialization and manufacturing also occurred.

The Great Depression and World War II were two of the most important events of the Twentieth Century. For many, the onslaught of the Depression was not apparent until the stock market crashed in October 1929. For farmers, however, hard times began much earlier. Agricultural prices had been depressed for nearly a decade before the crash and remained so until World War II.

The Great Depression affected every facet of American life, sapping energy from the economy and draining the citizenry's ability to build. Although no unemployment figures were kept, it is generally thought that the jobless rate hovered around 12 percent in Kentucky.

New Deal programs put together by the Roosevelt administration in the 1930s changed the face of Kentucky. Born of economic desperation of the Great Depression, the New Deal implemented work programs that provided paying jobs for the unemployed. The Civilian Conservation Corps (CCC), Works Progress Administration (WPA), Public Works Administration (PWA), Civil Works Administration (CWA), and Resettlement Administration put to work many of the Kentucky unemployed.

Mechanization of agriculture and the general decline in farming as a way of life, continued urbanization, major improvements in roads, and a decline in river traffic all occurred at this time. There were also

increases in stores and access to consumer goods. Kentucky's population increased during the period, but at a slower rate than the rest of the Southeast (McBride and McBride 2008:967). Logan County's population fluctuations (as measured by the United States Census Bureau [USCB]) are shown in Table 3-1.

Table 3-1. Population changes for Logan County, Kentucky (USCB 2014).

Census Year	Total Population
1800	5,807
1810	12,123
1820	14,423
1830	13,012
1840	13,615
1850	16,581
1860	19,021
1870	20,429
1880	24,358
1890	23,812
1900	25,994

Census Year	Total Population
1910	24,977
1920	23,633
1930	21,875
1940	23,345
1950	22,335
1960	20,896
1970	21,793
1980	24,138
1990	24.416
2000	26,573
2010	26,835

Logan County's industrial development increased in the 1950s. By 1970, manufacturing had replaced agriculture as the dominant source of income for the county (Richardson 1992). As of 1992, manufacturers in the county included Logan Aluminum, Emerson Electric, Red Kap, E.R. Carpenter Company, Illinois Tool Works, Shakeproof Division, Auburn Hosiery Mills, BTR Die Casting, and Odom Tennessee Pride. However, agriculture remained important to the county's economy. Russellville remained one of the state's leading tobacco markets in 1992 (Richardson 1992).

3.3 Historic Map and Aerial Photography Research

USGS maps available were the 1951 7.5 minute topographic map of the Adairville, Kentucky-Tennessee, quadrangle. Also available were a 1937 *Highway and Transportation Map of Logan County, Kentucky* (KDH 1937) and the 1955 *Rural Highway Series Map of Logan County, Kentucky* (KDH 1955). An aerial photograph from 1950 was also available (USGS 2014).

3.4 Previous Archaeological Research

A summary of the previous archaeological reports from surveys conducted within a two-kilometer buffer of the current project area was requested from the Office of State Archaeology (OSA) and received on December 4, 2014. At that time, one survey was previously completed and recorded in the digital archive for that area (Figure 3-6). The physical survey report files at the OSA were consulted on December 16, 2014.

In February of 2003, at the request of Mr. Chris Wilcutt of McGhee Engineering, Inc., Arrow Enterprise conducted an archaeological survey of two potential water tower locations in southern Logan County,

Figure 3-6. Locations of Previous Archaeological Investigations.

Kentucky. The project was conducted for the South Union Water Association of Adairville, Kentucky and the Lead Agency for the project is Rural Development. The Kentucky Clearinghouse # is KY 20020826-1529. One prehistoric site was identified during the survey, Site 15LO208. The site is an indeterminate prehistoric site that was listed as an inventory site and no further work was recommended. The site is discussed in more detail below (Schock 2003).

3.5 Known Archaeological Sites

A summary of recorded archaeological sites within the APE buffer was requested from the Office of State Archaeology (OSA) and received on July 23, 2014. At that time, one site had been previously recorded within a two-kilometer buffer of the current project area, site 15LO208.

Site 15LO208 is an indeterminate prehistoric site that produced fifty-three lithic artifacts but no diagnostic material. The artifacts consisted of two unifacial side scrapers, one bifacial scraper fragment, twelve utilized flakes, thirty-seven waste flakes, and one core. Three shovel probes were excavated within the site but no buried deposits were identified. The site is located on a crest of a knoll at about 640 ft. AMSL. At the time of the survey, the site was located within a winter wheat field with high surface visibility. The site was recorded in February of 2003 during the survey conducted by Arrow Enterprises for the South Union Rural Development, which is discussed above.

Section 4 - Methodology

In this chapter, the methods employed during the course of this study are described. These methods include the fieldwork activities, their application in different portions of the archaeological APE reflecting conditions encountered, and an evaluation of their effectiveness in aiding initial NRHP evaluation of archaeological sites. Laboratory methods are discussed in the following section (Section 5) along with the site assemblage and a discussion of the associated contexts of recovery and interpretation. This section concludes with an overview of the requirement for nomination to the NRHP.

4.1 Implemented Field Methods

The field methods implemented for Phase I investigations conform to the Kentucky Heritage Council's specifications for conducting a Phase I survey (Sanders 2006). The field methods included systematic shovel probes, bucket auguring, and visual inspection. Systematic shovel test probes (STPs) were excavated where possible. All soil excavated from the STPs was screened through ¼ inch mesh screens with the intention that any and all artifacts retained in the screen would be collected and bagged according to provenience. Shovel probes located beside streams were augured to determine whether or not prehistoric or historic surfaces were present beneath alluvial deposits 50 to 160 cm below the present surface.

Sixteen (n=16) STPs were excavated and five of these were augured. The location of all the shovel probes on USGS quadrangle maps are shown in Figure 4-1 and on an aerial photograph Figure 4-2.

4.1.1 Field Conditions

The entire APE was subjected to visual inspection. Shovel probing was conducted everywhere within the APE where conditions allowed.

Approximately 0.04 acres (0.016 ha) or about 14.8 percent of the 0.27 acre (0.11 ha) APE was disturbed by road/bridge/culvert construction. Approximately 0.02 acres (0.01 ha) or 7.4 percent of the 0.27 acre (0.11 ha) APE included stream bed and was subjected solely to visual inspection.

The portions of the APE that were subjected to systematic shovel probing traversed cultivated, fallow, and pasture fields on the floodplain of Pleasant Run. Ground surface visibility was less than ten percent across most of the APE, but a small section had higher visibility and was also surface collected. The various field conditions encountered during the survey are depicted in Figure 4-3 through Figure 4-7.

4.1.2 Evaluation of Field Methods Used

Visual inspection and shovel testing were used to identify and define approximate site limits within the survey area. Auguring of shovel probes was employed to identify possible buried cultural contexts within alluvial zones. The methods were successful in identifying site location, delineating site boundaries, obtaining a sample of cultural materials from the site, and ruling out the presence of buried cultural layers.

Figure 4-1. Location of STPs and Augers on USGS Topographical Map.

Figure 4-2. Location of STPs and Augers on Aerial Photograph.

Figure 4-3. View of General Project Area: South Side of BR 549, Cultivated Field and Road Construction Berm, Looking Northwest.

Figure 4-4. View of General Project Area: North Side of BR 549, Road/Culvert/Bridge Construction Disturbance, Looking Northwest.

Figure 4-5. View of General Project Area: North Side of BR 549, Pasture, Looking Southeast.

Figure 4-6. View of General Project Area: South Side of BR 549, Cultivated Field with High Visibility, Looking Northwest.

Figure 4-7. View of General Project Area: South Side of BR 549, Fallow Field, Looking Southeast.

4.2 National Register Evaluation of Archaeological Sites

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their undertakings on properties listed or eligible for listing in the National Register and to give the Advisory Council on Historic Preservation a reasonable opportunity to comment. While it does not require the preservation of such properties, it does require that their historic or prehistoric values be considered in weighing the benefits and costs of federal undertakings to determine what is in the public interest. Section 106 is invoked when "any project, activity, or program that can result in changes in the character or use of historic properties" (36 CFR Part 800) whether federal agency jurisdiction is direct or indirect.

Pursuant to the October 1992 Amendments to the National Historic Preservation Act (Section 110 of NHPA 1980, amended 1992) an "undertaking" means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including (A) those carried out by or on behalf of the agency; (B) those carried out with federal financial assistance; (C) those requiring a federal permit, license, or approval; and (D) those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

Mere association with historic events or trends is not enough, in and of itself, to qualify under Criterion A; the property's specific association must be considered important as well. Often, a comparative framework is necessary to determine if a site is considered an important example of an event or pattern of events.

In order to qualify under Criterion B, the persons associated with the property must be individually significant within a historic context. As with all Criterion B properties, the individual associated with the property must have made some specific important contribution to history.

To be eligible under Criterion C, a property must meet at least one of the following requirements: the property must embody distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D requires that a property “has yielded, or may be likely to yield, information important in prehistory or history.” Most properties listed under Criterion D are archaeological sites and districts, although extant structures and buildings may be significant for their information potential under this criterion. In order to qualify under Criterion D, a property must meet two basic requirements:

E. The property must have, or have had, information that can contribute to our understanding of human history of any time period;

F. The information must be considered important.

The use of Criteria A, B, and C for archaeological sites is appropriate in limited circumstances but has never been supported as a universal application of the criteria. However, it is important to consider the applicability of criteria other than D when evaluating archaeological properties. It is important to note that under Criteria A, B, and C the archaeological property must have demonstrated its ability to convey its significance, as opposed to sites eligible under Criterion D, where only the potential to yield information is required.

Section 5 -

Materials Recovered

In this section the laboratory procedures and analytic methods are discussed and the materials recovered are presented. The analytic methods involve the use of an artifact classification scheme that creates useful analytic categories for evaluating National Register eligibility. The artifact assemblages are also discussed with the site descriptions and results in Section Six.

5.1 Laboratory Methods

Artifacts recovered during field investigations were brought to the CDM Smith archaeology laboratory in Lexington, Kentucky, for washing, cataloging, and initial analysis. Materials were washed and sorted by general material type (e g., historic vs. prehistoric). All prehistoric specimens are classifiable into one class based on stage of reduction, tool form, and portion represented. A series of attributes and metric data were then collected for specific prehistoric artifact classes including size of debitage, cortex presence and absence, thermal alteration, and raw material type. Prehistoric lithic specimens were identified by David McBride.

In the following discussion, each of the major categories of artifacts is defined. Prehistoric artifact types are discussed first, followed by the standard classifications of historic artifacts developed by South (1977).

5.1.1 Prehistoric Artifact Assemblages

This section describes the prehistoric laboratory methods and analytical procedures.

5.1.1.1 Prehistoric Lithics

The analyses included tool analysis, raw material analysis, and mass analysis. These different techniques provide complementary data and permit the extrapolation of stronger inferences about the organization of lithic technology at the four sites. One hundred percent of all surface-collected and excavated materials were subjected to these, except where noted below.

All debitage was macroscopically examined for evidence of retouch and/or utilization. Those artifacts displaying retouch and/or utilization were then separated from non-utilized debitage. Additionally, all chipped stone artifacts were analyzed for presence of primary geologic or secondary incipient cone cortex and macroscopic evidence of thermal alteration. A typology of specimens was developed using standard techniques and definitions employed throughout eastern North America (e.g., Callahan 1979; Crabtree 1982; and Odell 1996).

5.1.1.1.1 Lithic Debitage

One of the most ubiquitous artifact categories on prehistoric sites is lithic debitage, which is considered to include all the material produced from the initial reduction stage to the use/reworking stage. Debitage is produced during all stages of reduction, but the representation of each class as compared to the other classes provides insight into the types of lithic use that occurred at a specific location. All flakes, blades, chunks/shatter were analyzed according to platform facet and dorsal scar counts, presence of cortex, and macroscopic evidence of thermal alteration and/or utilization.

Flakes are pieces of debitage with two faces, a dorsal and a ventral. The dorsal surface can be partly or totally covered by cortex, but normally shows the scars from removals that were made before the flake was removed from the core. The ventral surface contains only the features related to the detachment of the particular flake.

Flake debitage produced in bifacial and unifacial technologies is divided into three major categories including primary flakes, secondary flakes, and tertiary flakes, and several subcategories based on specific morphological attributes. These lithic reduction categories follow classification stages proposed by Collins (1974), Flenniken (1978), Boisvert et al. (1979), Magne and Pokotylo (1981), Magne (1985), Ebright (1987), and Bradbury and Carr (1995) with some modifications. A brief description of each debitage category is provided.

> *Primary flakes* (primary and secondary decortication flakes) are those produced during the earliest stages of lithic reduction and result from the removal of cortex from the raw material. *Primary decortication flakes* are usually large and cortex is present on over 50 percent of the dorsal surface. *Secondary decortication flakes* contain cortex on less than 50 percent of the dorsal surface.
>
> *Secondary flakes* (interior and thinning flakes) result from the reduction and shaping of the initial biface. Secondary flakes characteristically display a well-developed bulb of percussion, one or more flake scars on the dorsal surface, and may exhibit platform preparation. *Interior flakes* generally have large, double faceted platforms perpendicular to the orientation of the flake. *Thinning flakes* may have multi-faceted platforms at an acute or obtuse angle to the flake's orientation and may show signs of crushing or battering in preparation for flake removal from the parent material.
>
> *Tertiary flakes* (late stage percussion and pressure flakes) result from the sharpening and/or reworking of tools or points. These flakes are generally very small with small striking platforms, often multifaceted and steeply angled. Tertiary flakes are usually underrepresented in artifact assemblages recovered with standard ¼ inch hardware mesh screens, as these flakes are frequently smaller than ¼ inch and pass through the screens.

Flakes struck from flake cores for further unifacial modification are generally indistinguishable from those produced in bifacial reduction. However, a formal, specialized unifacial technology is blade manufacture, which produces morphologically distinct artifacts.

> *Blades* are specialized flakes with more or less parallel or sub-parallel lateral edges which, when complete, are at least twice as long as wide (Owen 1982: 2). Blades contain at least one dorsal crest but may contain two or more dorsal crests. Blades are associated with prepared cores and blade technique and are not produced randomly (Crabtree 1982: 16).
>
> Debitage displaying some flake characteristics are classified as *undetermined flakes* if they are too fragmentary to determine flaking stage.
>
> *Chunks/shatter* are pieces of usable raw material with at least one freshly broken surface. Blocky and angular fragments are usually produced in the initial stages of flint knapping as a result of removing unstable areas of material from the core or blank. Chunks/shatter are distinguished from cores by the absence of negative flake scars and striking platforms. Natural processes may produce a small proportion of chunk/shatter.

5.1.1.1.2 Cores

A core consists of any piece of raw material from which flakes, blades, or bladelets have been intentionally removed. Cores can be embryonic, such as a piece of natural unprepared raw material with scars, reflecting the detachment of one or more flakes (Crabtree 1982: 30). Cores must exhibit at least one negative flake scar and a striking platform. Cortex may be retained over some of the surface, although this depends on the number of flakes or blades removed. The presence of primary geologic cortex may indicate that the raw material was procured from outcrops, whereas secondary incipient cone cortex on the core surface could suggest that raw material was procured from a stream context. Exhausted cores, (i.e., those too small for further reduction) may have been discarded at a site after use; cores still fit for reduction may also have been stored at a site for later use. The simplest forms of cores are described by the number of core platforms and whether the negative removals indicate blade or flake production.

A polyhedral core (amorphous core) contains opportunistically located striking platforms and a resultant randomly generated shape. The tendency to remove flakes along existing ridges in the material usually results in a globular form in exhausted cores. It is the most common core type as it is often the final attempt of a knapper to extract the last usable flakes from a piece of material. By definition it is irregular in shape and can have any number of remaining usable or abandoned striking platforms.

A core fragment consists of a portion of a core that exhibits at least one negative flake scar and striking platform, and one or more large-scale fresh fracture surfaces on one or several sides of the core. Core fragments are generally small in size and cannot be reliably assigned to any of the above categories.

5.1.1.1.3 Bifaces

Bifaces are generalized bifacially flaked artifacts which may be blanks or preforms for morphologically distinct bifacial tools, or finished tools in their own right. Types of bifaces are based on technological attributes including flake scar patterns, edge sinuosity, width/thickness ratio, and edge angles. Callahan's biface production stages (1 through 5) are followed in this analysis (1979). Biface fragments include specimens too fragmentary to be placed in a stage according to the Callahan (1979) model. Projectile points are pointed bifaces with a haft element.

5.1.1.1.4 Unifacial Tools

Unifacially flaked stone tools are made on flakes and retain the unmodified smooth ventral flake surface. Flakes these tools may be either debitage from bifacial reduction or may have been struck from cores with the intention of further modification. Blade cores, blades, multifacial flake cores, and the resultant unifacial tools are direct evidences of a unifacial tool manufacturing industry. Tools in this category include unifacial scrapers, burins, denticulates, and gravers. Also included is debitage that has been utilized and/or minimally retouched for use on an expedient basis and then discarded.

Unifacial scrapers are formal tools, meaning that they were deliberately modified and shaped flakes, prior to use, with the intention of curating the finished artifact. Although many unifacial scrapers were probably hafted, they are distinguished from the type "hafted scraper" by being worked only on one face and by the lack of a diagnostic haft element. Many scrapers have one or more graver spurs.

5.1.1.1.5 Retouched Flakes

Retouched flakes are flake tools that contain evidence of modification, either a result of intentional retouching or chipping of the flake to form a certain kind of edge, surface, or shape, the result of tool use (wear), or both (Andrefsky 1998: 77-80). All debitage was examined for evidence of utilization by

viewing the flake margins of each specimen with a 10 x magnifying hand lens. Specimens with microflake or retouch scars, edge polish, or other evidence of utilization along their margins were set aside for analysis and description. The retouched flakes where placed within the categories below.

5.1.1.1.6 Raw Material Analysis

The determination of raw material type was accomplished with the aid of written descriptions (Pace 1987; Shaw 1966A, 1966B; Shaw and Rainey 1965; Miller 1968; Rainey 1965A, 1695B). All debitage and tools in the assemblage were macroscopically inspected to determine raw material type and compared with existing descriptions. Examining raw material procurement trends can yield data on settlement patterns, resource procurement strategies, and trade and exchange networks.

5.1.1.1.7 Mass Analysis

Mass analysis focuses on the variables of size, shape, and presence of cortex on aggregate batches of debitage as a means of distinguishing various forms and characteristics of reduction within a lithic artifact assemblage. Because there are several disadvantages in using reduction stage classification exclusively to analyze flaking debris, data obtained from mass analysis can be used to compare with those gained from reduction stage classification to provide more solid interpretations of the lithic artifact assemblage (Ahler and Christensen 1983, Ahler 1989, Bradbury and Franklin 2000). Two general theoretical observations regarding flintknapping underlie mass analysis and are relevant to the current study:

Flintknapping is fundamentally a reductive technology, and the nature of this technology places predictable and repetitive size constraints on the byproducts (and products) produced. Most flakes produced early in reduction should be larger, and most flakes produced late in reduction should be smaller. Similarly, the frequency of flakes with cortex should be highest in early reduction and lowest in late reduction.

Variation in load application in the flintknapping procedure produces corresponding variations in both size and flake shape. Experimental data shows that percussion flaking, on the whole, is capable of producing flakes much larger in size than any produced by pressure flaking. Size grade distribution data provides a fairly direct measure of load application variation (Ahler 1989: 89-91).

For this project, all non-utilized debitage (flakes, flake fragments) were passed through a series of nested laboratory hardware cloth screens to sort by size. Size grades follow Stahle and Dunn (1982, 1984). The size grades are as follows:

Grade 0 includes specimens smaller than ¼ inch

Grade 1 includes specimens smaller than ½ inch but larger than ¼ inch

Grade 2 includes specimens smaller than 1 inch but larger than ½ inch

Grade 3 includes specimens smaller than 2 inches but larger than 1 inch

Grade 4 includes specimens larger than 2 inches

Flake debris from each provenience in each grade was weighed as an aggregate to the nearest tenth of a gram and then counted. One attribute, thermal alteration, was also recorded for the reduction debris. Thermal alteration is often intentional within the culture in order to change the properties of the chert in order to make the raw material more adept to tool production.

The presence of primary geologic cortex may indicate that the raw material was procured from outcrops, whereas secondary incipient cone cortex on the core surface suggests that raw material was procured from a stream context. Research has shown that reduction analysis insufficiently provides data on the stage during which a flake was removed. However, by comparing frequency of occurrence of cortex on flakes, research indicates that a higher percentage of flakes during the initial stages of lithic reduction will have cortex and a lower percentage will have cortex during the final stages of lithic reduction. In addition, the amount of the flake covered in cortex is also an indicator of the stage during which the flake was removed, again more coverage indicates removal during the initial stages and less coverage indicates later removal. Flakes with cortex were evaluated according to the following criteria:

Grade 1 includes specimens with primary geologic cortex over greater than 50% surface

Grade 2 includes specimens with primary geologic cortex over less than 50% surface

Grade 3 includes specimens with secondary conical cortex over greater than 50% surface

Grade 4 includes specimens with secondary conical cortex over less than 50% surface

All of these methods compose mass analysis. When taken together, they can provide extensive data on the methods of tool production.

5.1.1.1.8 Materials Recovered

A total of ninety-two (n=92) pieces of lithic debitage, one retouched biface (n=1), two cores (n=2), one utilized flake (n=1), and one projectile point (n=1) were recovered during this Phase I survey (Table 5-1). The lithic material consisted of fifty-four (n=54) pieces of St. Genevieve chert, forty-one (n=41) pieces of St. Louis chert, and two (n=2) pieces of Newman chert (Table 5-2).

Table 5-1. Prehistoric Artifacts.

Artifact Type	Total	Percentage
Biface	1	1%
Projectile Point	1	1%
Core	2	2%
Shatter	28	29%
Tested Cobble	1	1%
Secondary Flake	21	22%
Undetermined Flake	36	37%
Blade	1	1%
Tertiary Flake	4	4%
Secondary Decordication Flake	1	1%
Utilized Flake	1	1%
Grand Total	**97**	**100%**

Section 6 - Results

One archaeological site, Site 15LO267, was newly identified and recorded within the APE boundary as a result of this Phase I survey. The site location is shown in Figure 6-1 and Figure 6-2. The following is a description of the findings.

6.1 Site 15LO267

Site 15LO267 is a non-diagnostic, prehistoric lithic scatter. The site area within the APE measures 0.27 acre (1,092.7 sq. m), with a very high potential for extending outside the present survey boundaries.

6.1.1 Location

Site 15LO267 can be found on the USGS Adairville, Kentucky-Tenn, 7.5' quadrangle map (Figure 6-3). The UTM coordinates (Zone 16 NAD 27) for the center of the site are REDACTED. The confluence of Pleasant Run and Whippoorwill Creek runs approximately 1.9 km northeast of the site and the confluence of Whippoorwill Creek and the Red River runs approximately 6.1 km northeast by north of the site. Site 15LO267 is situated on a floodplain at 560 ft. AMSL surrounding Pleasant Run along both the north and south sides of BR 549 in Logan County (Figure 6-4). The site's location on KYTC design sheets for BR 549's proposed reconstruction is shown in Figure 6-5. The site area is shown in Figure 6-6 and Figure 6-7.

6.1.2 Site Description

At the time of the survey, the APE was in pasture along the north side of BR 549, west of Pleasant Run and was a fallow field along the south side of BR 549, west of Pleasant Run. These sections offered less than 10 percent ground surface visibility. The APE was a cultivated field along the south side of BR 549, east of Pleasant Run, and this section had around 90 percent ground surface visibility, allowing for surface inspecting in addition to shovel probing. The north side of BR 549, east of Pleasant Run was found to be disturbed due to road/bridge/culvert construction along with about a 40 m area along the south side of BR 549, west of Pleasant Run. The site is bound in all directions by the limits of the APE and by disturbance in the northeast corner of the site. The site likely continues beyond the APE in all directions, and possibly onto the terrace south of the survey area.

Shovel test probes (STPs) were excavated across this portion of the project area at 20 m intervals along two transects, one on either side of BR 549. When the site was identified, interval distance was reduced to 10 m between positives and negatives in order to refine the site boundary definitions. Five shovel probes were augured to test for the presence of alluvial deposits and the possibility for buried surfaces. No buried cultural deposits were identified. Nine positive STPs defined the site area.

6.1.3 Stratigraphy

Nine positive STPs were recorded within the bounds of site 15LO267 and all produced prehistoric material. STP 2 produced one piece of debitage but was accidently lost in the field and was not included in the material recovered. STP 10 also produced modern material and was within a disturbed context.

Figure 6-1. Location of Newly Recorded Archaeological Site on USGS Topography Map.

Figure 6-2. Location of Newly Recorded Archaeological Site on Aerial Photograph.

Figure 6-3. Location of Archaeological Site 15LO267 on USGS Topography Map.

Figure 6-4. Location of Archaeological Site 15LO267 on 2010 Aerial Photograph.

Figure 6-5. Location of Archaeological Site 15LO267 on Design Sheet.

Figure 6-6. Site 15LO267, High Surface Visibility Area, South Side of BR 549, Cultivated Field, Looking Northwest.

Figure 6-7. Site 15LO267, Pasture Area, North Side of BR 549, Looking Southeast.

6.1.3.1 STP 5

A stratigraphic profile of STP 4 is illustrated in Figure 6-8. It is representative of the stratigraphy found throughout the site. STP 4 was located along the northern side of BR 549, about 5 meters west of Pleasant Run. The shovel probe, excavated to a depth of 53 cm below the surface (cmbs) and augured to 100 cmbs, consisted of three zones. Zone I was a 10YR 4/4 to 4/6 dark yellowish brown clay loam that extended from surface to 27 cmbs. Zone II, between 27 to 53 cmbs, consisted of 10YR4/3 brown loam with 7.5YR3/4 dark brown and 10YR3/1 very dark gray inclusions. Zone III, between 53 to 100 cmbs, consisted of 10YR4/1 dark gray and 10YR4/2 dark grayish brown loamy sand with 7.5YR3/4 dark brown inclusions. Zone III continued until the base of the auger testing at 100 cmbs where it hit the water table.

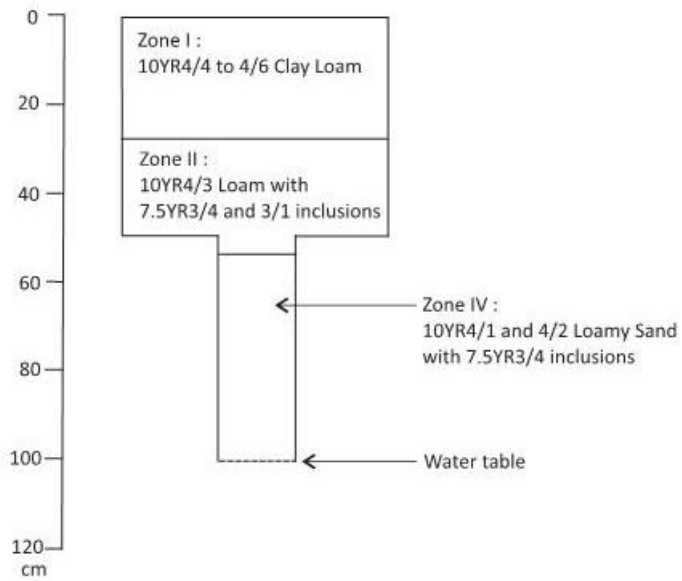

Figure 6-8. Shovel Test Probe Profile from Site 15LO267.

All artifacts from the positive STPs were found between 0 to 55 cmbs. No cultural features, artifact middens, or intact soils were identified in any of the STPs.

6.1.4 Features

No surface or subsurface features were located during the Phase I archaeological investigations at Site 15LO267.

6.1.5 Materials Recovered

A total of ninety-two (n=92) prehistoric artifacts were recovered. Modern artifacts, those less than fifty years old, were also recovered but discarded.

6.1.5.1 Prehistoric Artifacts

A total of ninety-two (n=92) pieces of lithic debitage, one retouched biface (n=1), two cores (n=2), one utilized flake (n=1), and one projectile point (n=1) were recovered during this Phase I survey (see Table 5 1). The lithic material consisted of fifty-four (n=54) pieces of St. Genevieve chert, forty-one (n=41) pieces of St. Louis chert, and two (n=2) pieces of Newman chert (see Table 5 2). The artifact density for the prehistoric component was low, and the scatter was evenly dispersed across the surveyed site area. All of the prehistoric assemblage was non-diagnostic (Table 6-1).

Table 6-1. Site 15LO267 Prehistoric Artifacts.

Artifact Type	STP								Surface	Total
	3	5	7	8	10	13	R1	R2		
Biface									1	1
Projectile Point									1	1
Core									2	2
Shatter	3		1	11		1	1		11	28
Tested Cobble	1									1
Secondary Flake	1		2	10					8	21
Undetermined Flake		5	1	13	1	1		1	14	36
Blade									1	1
Tertiary Flake				4						4
Secondary Decordication Flake			1							1
Utilized Flake									1	1
Total	**5**	**5**	**5**	**38**	**1**	**2**	**1**	**1**	**39**	**97**

6.1.6 Discussion

Site 15LO267 is a non-diagnostic, prehistoric lithic scatter. It is difficult to draw conclusions of settlement activities and structure from these artifacts. It appears that prehistoric people occupied the site for a limited time and engaged in a limited range of activities. Since no diagnostic material was recovered it is not possible to assign the occupation to any cultural or temporal period

6.1.6.1 Interpretation

Site 15LO267, as recorded within the project APE, consists of a low density, lithic debitage scatter. Neither the assemblage as a whole nor any of the individual artifacts is diagnostic of any cultural tradition or temporal period. No intact soils or features were encountered. The site likely extends outside the project area in all directions and possibly onto the terrace south of the survey area. The site area within the APE is partially disturbed due to road/bridge/culvert construction and plowing.

6.1.7 National Register Eligibility

The artifact assemblage consists of a limited range of artifact types, a low number of artifacts recovered, and the lack of intact subsurface features, artifact middens, or intact soils, indicating that the site was occupied for a limited period and a limited range of activities took place. Cultural and temporal affiliation could not be determined due to the lack of diagnostic artifacts. It is difficult to draw conclusions of settlement activities from such a limited artifact assemblage. As a result, the site has limited research potential and would not yield important information to prehistory. No evidence of intact subsurface deposits, features, or middens were identified in the shovel probes or augers, suggesting a lack of integrity for the site. Therefore, the surveyed portion of Site 15LO267 is not recommended for nomination to the NRHP, according to Criteria A, B, C, or D.

6.1.8 Recommendations

No further archaeological work is recommended for the portion of Site 15LO267 within the APE.

6.2 Summary

At the request of the KYTC, archaeologists from CDM Smith conducted a Phase I archaeological survey ahead of proposed improvements and bridge replacement along BR 549 over Pleasant Run in Logan County, Kentucky (KYTC Item Number 3-1073.00). The APE consisted of 0.27 acres (0.109 ha) along KY 664.

The APE was visited by a CDM Smith archaeological crew on November 25th, 2014. The archaeological survey involved systematic shovel test excavation, systematic surface collection where possible, and visual inspection over the entire APE. One previously unrecorded archaeological site, 15LO267, was identified within the APE. It is recommended as not eligible for listing on the NRHP.

Table 5-2. Prehistoric Raw Material.

Artifact Type	St. Genevieve	St. Louis	Newman
Biface		1	
Projectile Point	1		
Core	2		
Shatter	23	5	
Tested Cobble	1		
Secondary Flake	12	9	
Undetermined Flake	9	25	2
Blade	1		
Tertiary Flake	4		
Secondary Decordication Flake		1	
Utilized Flake	1		
Grand Total	**54**	**41**	**2**

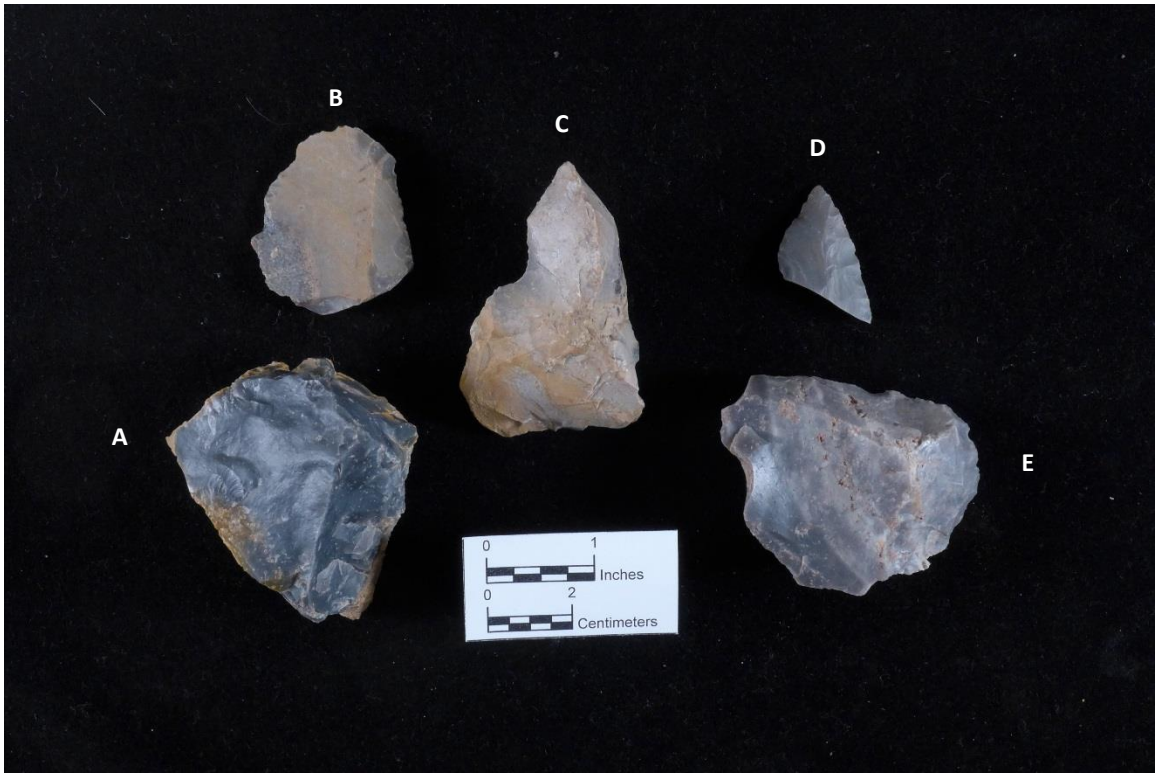

Figure 5-1. Tools from Site 15LO267: A) Core; B) Utilized Flake; C) Biface; D) Projectile Point Tip Fragment; E) Retouched Core (from bottom left to bottom right).

Section 7 -

Recommendations and Summary

Recommendations

7.1 Site 15LO267

Site 15LO267 is a non-diagnostic prehistoric lithic scatter. The site area within the APE measures 0.27 acre (1,092.7 sq. m). The site area is situated on a floodplain along BR 549 at 560 ft. AMSL surrounding Pleasant Run in Logan County, Kentucky. At the time of survey it was in a fallow field, a cultivated field, and pasture. The confluence of Pleasant Run and Whippoorwill Creek runs approximately 1.9 km northeast of the site and the confluence of Whippoorwill Creek and the Red River runs approximately 6.1 km northeast by north of the site.

The site likely continues beyond the APE in all directions, and possibly onto the terrace south of the survey area.

7.1.1 National Register Eligibility

The artifact assemblage consists of a limited range of artifact types, a low number of artifacts recovered, and the lack of intact subsurface features, artifact middens, or intact soils, indicating that the site was occupied for a limited period and a limited range of activities took place. Cultural and temporal affiliation could not be determined due to the lack of diagnostic artifacts. It is difficult to draw conclusions of settlement activities from such a limited artifact assemblage. As a result, the site has limited research potential and would not yield important information to prehistory. No evidence of intact subsurface deposits, features, or middens were identified in the shovel probes or augers, suggesting a lack of integrity for the site. Therefore, the surveyed portion of Site 15LO267 is not recommended for nomination to the NRHP, according to Criteria A, B, C, or D.

7.1.2 Recommendations

No further archaeological work is recommended for the portion of Site 15LO267 within the APE.

7.2 Summary

At the request of the KYTC, archaeologists from CDM Smith conducted a Phase I archaeological survey ahead of proposed improvements and bridge replacement along BR 549 over Pleasant Run in Logan County, Kentucky (KYTC Item Number 3-1073.00). The APE consisted of 0.27 acres (0.109 ha) along BR 549.

The APE was visited by a CDM Smith archaeological crew on November 25th, 2014. The archaeological survey involved systematic shovel test excavation, systematic surface collection where possible, and visual inspection over the entire APE. One previously unrecorded archaeological site, 15LO267, was identified within the APE. It is recommended as not eligible for listing on the NRHP.

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Appendix A -

Artifact Inventory

Table A-1. Prehistoric Artifact Catalog.

Cat No.	Site #	FieldSite#	Provenience	Depth	Group	Class	Type	Subtype 1	Subtype 2	Deb SG	Raw Material	Cortex	HT	Length	Width	Thickness	Weight	Quantity
2	15LO267	CDMS 1	Surface 2		Lithic	Chipped	Biface	retouched			St. Louis			66.55	43.08	22.38	58.6	1
2	15LO267	CDMS 1	Surface 2		Lithic	Chipped	Biface	Projectile Point			St. Genevieve			33.78	22	5.7	3.7	1
1	15LO267	CDMS 1	Surface		Lithic	Chipped	Core				St. Genevieve			52.31	37.39	36.65	150.5	1
2	15LO267	CDMS 1	Surface 2		Lithic	Chipped	Core	retouched			St. Genevieve			59.6	43.44	22.99	80	1
3	15LO267	CDMS 1	STP 3	0-25	Lithic	Chipped	Debitage		Shatter	1	St. Genevieve						0.9	3
3	15LO267	CDMS 1	STP 3	0-25	Lithic	Chipped	Debitage		Tested Cobble`	3	St. Genevieve	3					117.2	1
3	15LO267	CDMS 1	STP 3	35-45	Lithic	Chipped	Debitage		Secondary Flake	1	St. Genevieve						0.4	1
10	15LO267	CDMS 1	STR R2	0-25	Lithic		Debitage		Undetermined Flake	1	St. Louis		Y				0.4	1
8	15LO267	CDMS 1	STP 13	0-30	Lithic		Debitage		Undetermined Flake	1	St. Louis	4	Y				0.7	1
8	15LO267	CDMS 1	STP 13	0-30	Lithic		Debitage		Shatter	3	St. Louis	3					75.7	1
4	15LO267	CDMS 1	STP 5	40-50	Lithic		Debitage		Undetermined Flake	1	St. Louis						0.9	4
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Shatter	1	St. Genevieve						7.7	8
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Shatter	2	St. Genevieve						16.6	2
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Shatter	1	St. Louis						0.7	1
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Undetermined Flake	0	St. Genevieve						0.7	3
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Undetermined Flake	1	St. Genevieve						2.5	4
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Undetermined Flake	1	St. Louis						1.2	2
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Secondary Flake	2	St. Genevieve		Y				6	1
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Secondary Flake	1	St. Genevieve		Y				1.6	2
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Secondary Flake	2	St. Genevieve						2.9	1
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Secondary Flake	1	St. Louis						0.4	1
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Undetermined Flake	2	St. Genevieve						4.5	1
1	15LO267	CDMS 1	Surface		Lithic		Debitage		Blade	2	St. Genevieve						2.8	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Secondary Flake	2	St. Louis						7	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Secondary Flake	1	St. Louis						1	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Undetermined Flake	1	St. Louis						1	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Secondary Flake	1	St. Genevieve						2.4	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Undetermined Flake	2	St. Genevieve						4.3	1
2	15LO267	CDMS 1	Surface 2		Lithic		Debitage		Undetermined Flake	1	St. Louis						3.6	2
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Shatter	2	St. Genevieve						8.2	1
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Shatter	1	St. Genevieve						4.1	3
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Secondary Flake	1	St. Louis						0.5	1
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Secondary Flake	1	St. Genevieve						2.2	3
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Secondary Flake	2	St. Genevieve						1.7	1
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Shatter	0	St. Genevieve						0.5	3
6	15LO267	CDMS 1	STP 8	20-40	Lithic		Debitage		Tertiary Flake	1	St. Genevieve						0.7	4
5	15LO267	CDMS 1	STP 7	25-45	Lithic		Debitage		Secondary Decordication Flake	2	St. Louis	4					15	1

Cat No.	Site #	FieldSite#	Provenience	Depth	Group	Class	Type	Subtype 1	Subtype 2	Deb SG	Raw Material	Cortex	HT	Length	Width	Thickness	Weight	Quantity
5	15LO267	CDMS 1	STP 7	25-45	Lithic		Debitage		Shatter	2	St. Genevieve						3.7	1
5	15LO267	CDMS 1	STP 7	25-45	Lithic		Debitage		Secondary Flake	1	St. Genevieve						0.6	1
5	15LO267	CDMS 1	STP 7	25-45	Lithic		Debitage		Secondary Flake	1	St. Genevieve						0.7	1
5	15LO267	CDMS 1	STP 7	25-45	Lithic		Debitage		Undetermined Flake	1	St. Louis						0.1	1
7	15LO267	CDMS 1	STP 10		Lithic		Debitage		Undetermined Flake	1	St. Louis						0.5	1
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Secondary Flake	2	St. Louis						9.7	3
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Secondary Flake	1	St. Louis						1	2
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Undetermined Flake	1	Newman						1.8	2
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Undetermined Flake	0	St. Louis						1.6	11
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Shatter	1	St. Louis						1.4	3
6	15LO267	CDMS 1	STP 8	0-20	Lithic		Debitage		Shatter	2	St. Genevieve						6.8	1
9	15LO267	CDMS 1	Radial 1	25-35	Lithic		Debitage		Shatter	2	St. Genevieve						7.4	1
4	15LO267	CDMS 1	STP 5	0-20	Lithic		Debitage		Undetermined Flake	0	St. Louis						0.1	1
1	15LO267	CDMS 1	Surface		Lithic		Uniface	Uitilized Flake			St. Genevieve	1					15.9	1

Appendix B -

Archaeological Site Forms

___ Preliminary Form
X Final Form

X New Site
___ Repeat Visit

KENTUCKY ARCHAEOLOGICAL SITE SURVEY FORM

Office of State Archaeology

I D E N T I F I C A T I O N

County Logan

State Site No. KYLo267

Site Name

Other Site No. _____ Project Site No. CDMS 1

L O C A T I O N

1. Coordinate System 1 X UTM
   2 ___ KPC

   Zone if UTM, X 16, ___ 17
   If KPCS, ___ North, or 2 ___ South

   Northing 4066453.784

   Easting 516321.8628

2. Quadrangle Name Adairville, Ky.-Tenn.

   Quadrangle Date 1951

3. Reliability of Site Location Information

   0 X good 1 ___ approximate 2 ___ location unknown

O W N E R S H I P

Name*(s)*

Wayne & Patsy Dean

Address and Phone

3551 Halls Store Rd.

Russellville, KY 42276

270-726-2261

Tenant (*if any*)

Address and Phone

Page 2. Site No. 15Lo267

TEMPORAL–CULTURAL AFFILIATIONS

1. Cultural Periods Represented

45
32 34
35 38
39 41
42
43
44

X Unassigned
____ Paleo-Indian, undefined ____ Early ____ Late
____ Archaic, undefined ____ Early ____ Middle ____ Late
____ Woodland, undefined ____ Early ____ Middle
____ Late Woodland/Mississippian
____ Historic Indian
____ Historic Non-Indian

2. Archaeological Cultures Represented

46 49
50 53
54 56

____ Adena ____ Hopewell ____ Ft. Ancient ____ Stone Grave
____ Mississippian ____ Cherokee ____ Pisgah ____ Lost River
____ Caborn-Welborn ____ Yankeetown ____ Angel
OTHER *(describe)* ____

3. How were cultural affiliation and age determined *(describe diagnostic artifacts, type names, and attach outline drawings)?*

No diagnostic artifacts

Prehistoric materials collected: 97 total number of items

Type	Number		
ceramics		other scrapers	
projectile points/fragments	1	flakes/cores/chunks	96
hafted scrapers/drills		ground/pecked/battered	
other drills		stone	
Bifaces/fragments		worked bone/shell	
unifaces		human bone/burials	
perforators/gravers		faunal materials	
spokeshaves			

Prehistoric materials observed but not collected *(describe)*

none

Page 3. Site No. 15Lo267

8 9

4. Approximate Historic Site Date Range

1	____	pre 1600	6	____	1701-1750	11	____	1900-2000
2	____	1600-1700	7	____	1751-1800	12	____	1901-1950
3	____	1601-1650	8	____	1801-1900	13	____	1951-2000
4	____	1651-1700	9	____	1801-1950	14	____	1851-1950
5	____	1701-1800	10	____	1851-1900	15	____	1801-1950

Historic materials collected none

Historic materials observed but not collected none

PHYSICAL DESCRIPTION

10 11

1. Site Type

0	____	undetermined	10	____	non-mound earthwork
1	X	open habitation w / o mounds	11	____	workshop
2	____	isolated find	12	____	isolated burials
3	____	rockshelter	13	____	cemetery
4	____	cave	14	____	other special activity area
5	____	quarry	15	____	open habitation w/ mounds
6	____	stone mound	16	____	historic farm/residence
7	____	earth mound	17	____	industrial
8	____	mound complex	18	____	military
9	____	petroglyph/pictograph	OTHER:		

12

2. Midden

0 ____ unknown 1 ____ earth 2 ____ shell 3 X absent

13

3. Evidence of recent vandalism *(within the last month)*

1 X no 2 ____ yes

14

4. Site Condition

1	____	apparently undisturbed	5	____	76-99% disturbed
2	X	less than 25% disturbed	6	____	totally destroyed
3	____	26-50% disturbed	7	____	disturbed, % unknown
4	____	51-75% disturbed			

17 18

5. Major Land Use

1	X	cultivated	8	___	modern cemetery	16	___	14+15
2	X	pasture	9	___	mining	17	___	commercial
3	___	woods/forest	10	___	inundated	18	___	military
4	___	road/trail	11	___	industrial	19	___	logging/ logging related
5	___	ditch/dike/ borrow pit	12	___	residential	20	___	scrub/secondary growth
6	___	landfill	13	___	recreational			
7	___	modern	14	___	1+2+3			
			15	___	11+12+13	Other		

Page 4. Site No. 15Lo267

19

6. Amount of ground surface visible *(typically)*

1	X	less than 10%	5		poor
2		11-50%	6		fair
3	X	51-91%	7		good
4		91-100%	8		excellent

Describe visibility One field was sewn in winter wheat which was just starting to come up This field offered over 90% visibility. The remaining areas offered less than 10% visibility.

20

7. Physiographic Division

1		Inner Bluegrass	5	X	Mississippi Plateau
2		Outer Bluegrass	6		Western Coalfields
3		Knobs	7		Jackson Purchase
4		Cumberland Plateau			

21

Landform Type

1	X	floodplain	4		dissected uplands
2		terrace	5		undissected uplands
3		hillside	OTHER		

22

Locality Type

1	X	level	5		bluff base
2		knoll	6		ridge
3		closed	7		slope
4		bluff crest	OTHER		

23 25 26 28 29 31

8. Soil Association Pembroke-Crider

Soil Series Dunning and Newark

Soil Type Dunning Silty Clay Loam and Newark Silt Loam

Vegetation *(describe)* Winter wheat sprouts and sod grass

32 35 36

9. Elevation 560 ft. AMSL

Slope of Locality

1	X	less than 5°, flat	4		26-50°
2		6-10°	5		greater than 51° bluff (rockshelter)
3		11-25°			

37

Slope Direction (Aspect)

1	X	Flat	4		E	7		SW
2		N	5		SE	8		W
3		NE	6		S	9		NW

38 45 46 47

10. Site Area (m^2) 1,460

Basis for site area estimate

1		taped	3		guessed	5		transit/alidade
2	X	paced	4		range	6		

48

Confident of site boundaries:

1	X	no	2		yes

Page 5. Site No. 15Lo267

49 50

11. Drainage

1	____	Mississippi	6	____	Green	11	____	Kentucky
2	____	Tennessee	7	____	Western Ohio	12	____	Licking
3	X	Lower Cumberland	8	____	Central Ohio	13	____	Little Sandy
4	____	Upper Cumberland	9	____	Eastern Ohio	14	____	Big Sandy
5	____	Tradewater	10	____	Salt	15	____	Tygarts

51

Closest Water Source *(name)* Pleasant Run

1	X	permanent stream	4	____	intermittent spring
2	____	intermittent stream	5	____	lake/pond *(historic sites only)*
3	____	permanent spring	6	____	slough/oxbow lake
			7	____	well *(historic sites only)*

53

Rank order of stream nearest site 2

53 55

Distance to water from site 0 m, runs through the site.

REPORTING INFORMATION

56

1. Site reported by
   - 1 X professional/student
   - 2 ____ amateur
   - 3 ____ other informant

57

2. Investigation type
   - 1 X reconnaissance (*surface survey, may include shovel tests*)
   - 2 ____ intensive (*surface survey and testing*)
   - 3 ____ excavated
   - 4 ____ volunteered

58 59

3. Institution/person filing report CDM Smith

Site surveyed by Dona Daugherty & Ann Wilkinson

60 62

Date recorded November 25, 2014

Time of day Mid-day Time spent at site Three hours

66 67

4. Artifact Repository *(name and address where artifacts are curated)*

William S. Webb Museum of Anthropology, University of Kentucky

Name of curator at repository

Nancy O'Malley

5. Photos

____	black/white	____	no. of pictures
X	Color, digital	7	no. of pictures

Name and address of institution where photos are filed

same

Page 6. Site No. 15Lo267

6. Name and address of local informants

none

7. Name and address of owners of other collections from site *(attach inventories of private collections.)*

unknown

8. Significance Status

69

1 ___ National Register property
2 ___ Eligible for National Register
3 ___ Nominated to National Register by SHPO
4 ___ Considered eligible but not nominated by SHPO
5 ___ Inventory site (does not presently meet National Register criteria)
6 X National Register status not assessed

Discuss the potential significance of the site *(does it meet National Register criteria in your opinion? why or why not? upon what evidence have you based your decision?)*

The full significance of the site, and the site's potential for meeting the criteria for the National Register, cannot be assessed since only the portion of the site within the current survey boundaries was tested. The site likely extends in all directions across the floodplain and possibly onto the terrace south of the survey area.

The known portion of the site did not produce any subsurface features, and only one of the 97 lithic artifacts was a tool and not debitage. Thus the known portion of the site is not considered significant and will not be recommended for nomination to the NRHP.

9. References

Daugherty, Dona, and Ann Wilkinson
2014 A Phase I Archaeological Survey for Bridge Replacement on KY664 (MP 3.298) Over Pleasant Run, 2.3 Miles Northwest of the Junction of KY663 (Hall's Store Road), Logan County, Kentucky. KYTC Item # 3-1073.00. CDM Smith. Lexington, Kentucky.

10. Ownership

70

1 ___ federal
2 X state
3 ___ local government
4 ___ government
5 ___ private
6 ___ joint state/federal

11. Special status (federal, state, county, etc.)

71

1 ___ forest
2 ___ park
3 ___ wilderness
4 ___ wild river
5 ___ wildlife preserve
6 ___ nature preserve
7 ___ military preserve
8 ___

Page 7. Site No. 15Lo267

DESCRIPTION OF SITE

Give a physical description of the site and its settings, including dimensions, features (with measurements), nature and location of artifacts and concentrations, extent and location of disturbances, etc.

The newly recorded CDMS 1 was identified during a Phase I survey of the KYTC KY664 Bridge Replacement project area, conducted by CDM Smith archaeologists on November 25, 2014. The surveyed area involved 2 five- to ten meter-wide corridors, one on each side of the existing KY664 ROW. The setting was a level floodplain surrounding Pleasant Creek that had been utilized during the past year for agricultural crops and pastureland. The entire area was shovel probed at twenty meter intervals with radials placed at 10 meter intervals between positive and negative zones. The bucket augur was used in the base of five of the probes to test for buried surfaces beneath alluvial deposits. One area south of KY664 and east of Pleasant Run was sewn in winter wheat and offered a nearly 100% ground surface visibility. This area was surface collected in addition to the shovel probing.

In total, sixteen probes were excavated and nine were positive with lithic materials. The area of surface collection produced a moderate concentration of lithic artifacts at the surface. There were no subsurface features revealed in the shovel probes or augur profiles. An assemblage of 96 core/shatter/flake pieces and one (n=1) broken PPK tip were recovered from the approximately 1,460 square meter site area. It is considered highly likely by the surveyors that the site extends beyond the project survey boundaries in all directions, and also likely that it would extend onto the terrace just south of the survey area.

Discuss the relationship between this site and other known sites in the area in terms of location, physical characteristics, size, etc.

Site 15Lo208 is southeast of CDMS 1 and consists of an indeterminate prehistoric site. Fifty pieces of debitage and three scrapers were recovered from the site, but no diagnostic material. Three shovel probes were excavated but no buried deposits were identified. The site is located on a crest of a knoll and measures about 30 x 30 meters in size and sits at 640 ft. AMSL. At the time of the survey, the site was located in a field of winter wheat that had high surface visibility. The site was recorded as an inventory site and no further work was recommended. No other sites were located within 2 km of the current project area.

DATES

Absolute dates _____ Dating methods _____

_____ Laboratory _____

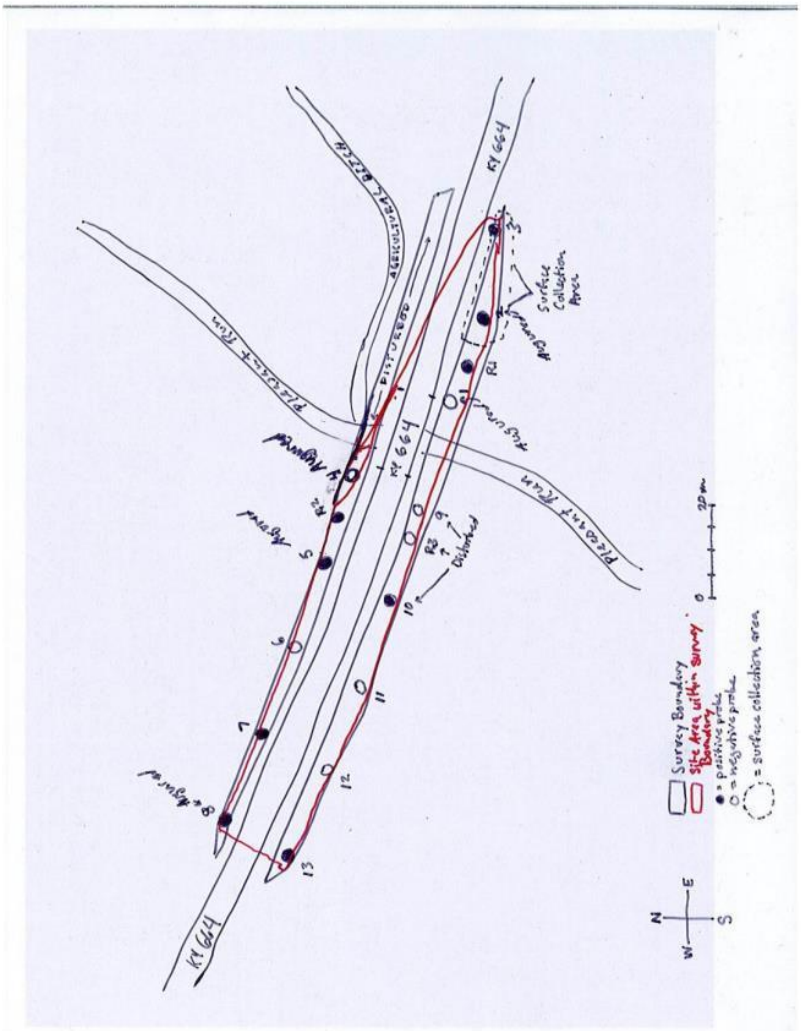
Relative dates _____ References _____

Page 8.

Site No. 15Lo267

SKETCH MAP OF SITE

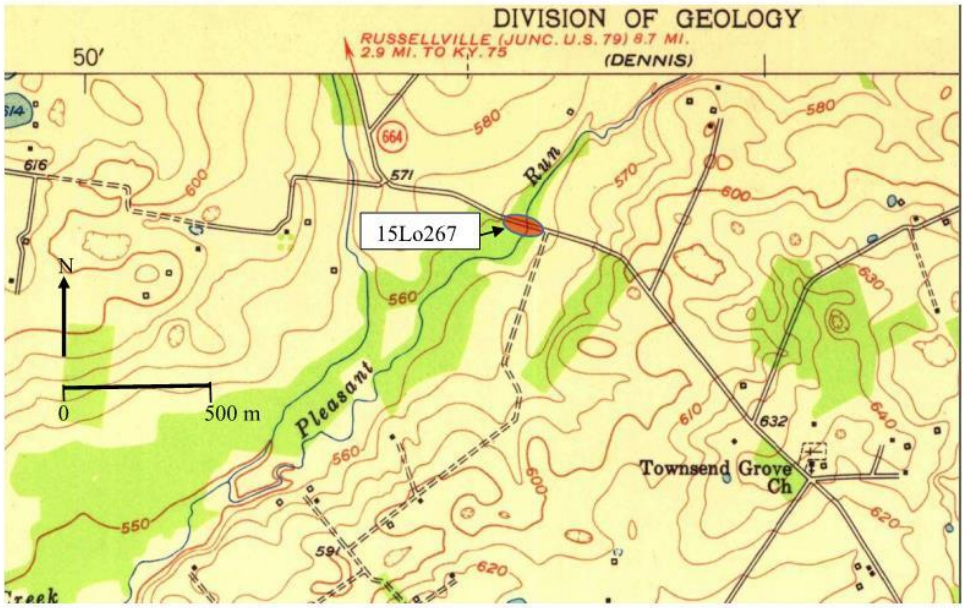
Include north arrow and scale. Also attach section of U.S.G.S. quad map with site location.



Directions to Site

	Terrain feature	Distance (km)	Direction/bearing
1.	Highest nearby elevation 640ft AMSL	1.25 km	WNW
2.	Conflc. Pleasant Run and Whippoorwill Creek	1.9 km	NE
3.	Conflc. Whippoorwill Creek and Red River	6.1 km	NE by N

Page 9. Site No. 15Lo267



15Lo267 location on 1951 Adairville, Ky.-Tenn., USGS 7.5' quadrangle map.

Location on USGS Quadrangle Map