PHASE IA ARCHAEOLOGICAL RECONNAISSANCE OF

920 ACRES AT THE FORMER INDIANA ARMY AMMUNITION PLANT

IN CLARK COUNTY, INDIANA

For Submission To:

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ABSTRACT

The Public Service Archaeology Program of the University of Illinois at Urbana Champaign conducted a Phase Ia survey of approximately 368 ha (920 acres) of the former Indiana Army Ammunition Plant (INAAP) in Clark County, Indiana, for the INAAP Reuse Authority of Jeffersonville, Indiana. The scientific archaeological investigation was conducted for proposed commercial development of the former INAAP. The investigations involved archival research and posthole survey of the project area. Thirteen archaeological sites were identified within the project area. One site (12CL648) is considered potentially eligible for listing in the National Register of Historic Places, and Phase II NRHP evaluation is recommended for this site.

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INTRODUCTION

The Public Service Archaeology Program of the University of Illinois at Urbana Champaign was contracted by the INAAP Reuse Authority of Jeffersonville, Indiana, to conduct a Phase Ia archaeological reconnaissance of approximately 368 ha (920 acres) at the former Indiana Army Ammunition Plant in Clark County, Indiana (Figures 1 and 2). The project area is the site of proposed commercial development and is located between Charlestown and Jeffersonville in southern Clark County. It is bordered on the west by State Route 3/62 and on the east by the Ohio River. This report provides general background information including the environment and culture history for the project area, the methods used to complete the investigations, and the results of those investigations.

This project was conducted by staff members of the Public Service Archaeology Program from the University of Illinois at Urbana Champaign. Field work was conducted between 24 June and 13 August 2002 by a field crew supervised by Dr. Brian Adams. Historic background research was conducted by Alice Berkson, an historic archaeologist with a Master s Degree in History from Illinois State University. Six prehistoric, five historic, and two prehistoric/historic archaeological sites were identified in the project area. Artifacts from the prehistoric site were analyzed by Dr. Brian Adams who has extensive experience in Midwestern prehistoric artifact analysis, while historic artifacts were analyzed by Jacqueline McDowell and Alice Berkson.

At the time of the survey, the project area consisted of variable field conditions. Approximately 24 percent (224 acres) of the surveyed area has been extensively disturbed areas by INAAP activity. Disturbances consist of asphalt and gravel parking lots, graded/landscaped lawns, railroad right-of-ways, razed INAAP structure locations, a reservoir, and severely eroded areas. All disturbed areas have been plotted on topographic maps and photographed. The remainder of the project area (696 acres) consists of leased agricultural land currently used as cattle pasture. Surface visibility in pastures was less than 30 percent, and these areas were investigated by screened posthole tests at 10-m intervals. Thirteen archaeological sites (12CL640, 12CL641, 12CL642, 12CL643, 12CL644, 12CL645, 12CL646, 12CL647, 12CL648, 12CL649, 12CL650, 12CL651, and 12CL652) were identified in the project area. Six sites (12CL644, 12CL646, 12CL647, 12CL649, 12CL651, and 12CL652) are pre-Columbian Native American, five (12CL640, 12CL641, 12CL642, 12CL643, and12CL648) are Euroamerican historic sites, and two (12CL645 and 12CL650) have both historic and prehistoric components. One historic site is considered potentially eligible for listing in the National Register of Historic Places, and Phase II investigations are recommended. No further work is recommended for the remaining 12 sites.

Figure 1. Location of project in Indiana.

Figure 2. Location of the project area.

RESEARCH METHODS

A number of research techniques were employed to identify and evaluate archaeological resources present within the Indiana Army Ammunition Plant (INAAP) in Clark County, Indiana. The methods employed to conduct this Phase 1a surface reconnaissance survey include a records search and literature review, archaeological field investigations, laboratory analyses, and technical report preparation and follow the guidelines established by the Indiana Division of Historic Preservation and Archaeology (IDHPA) for Phase 1a reconnaissance surveys (IDHPA 1989,1999). These methods are described below.

Records and Literature Review

A records search conducted to identify previously recorded archaeological resources within Clark County, Indiana, and the INAAP facility has been completed by PSAP, and the results are presented later in this report in the Cultural Setting section. Documentary sources available at the IDHPA as well as maps and documents available at the INAAP facility related to its construction and operation were reviewed. The documentary research also identified areas within the survey corridor that were previously subject to a reconnaissance-level archaeological survey, and an attempt was made to identify areas of significant disturbance prior to the field reconnaissance survey. At present, there are 16 sites recorded with the IDHPA as being present within the limits of the INAAP (Peter et al. 1995). None of these sites, however, is located in the survey area reported here. U.S. General Land Office maps, historical plats and atlases, and early USGS 15' quadrangles for Clark County have also been reviewed to identify the location of potential historic sites in the survey area.

Archaeological Field Methods

Field investigations were carried out by various-sized crews employing methods provided in the guidelines. To obtain complete survey coverage, a number of field techniques have been used including systematic pedestrian reconnaissance and systematic subsurface testing (i.e., posthole testing).

In portions of the survey area with surface visibility below 30 percent, screened subsurface tests were excavated at 10-m intervals. The subsurface tests were hand-excavated with a posthole digger in 10-cm levels to culturally sterile subsoil. In the event that a posthole test was positive, it was excavated to a depth at which culturally sterile deposits were encountered. Additional bracketing tests were then excavated at 5-m intervals from positive tests in instances where no surface scatter was present or visibility was below 30 percent as a means of establishing site boundaries. Soil profiles were recorded for all positive subsurface tests and included information on soil color, texture, and depth of artifacts recovered. All excavated sediments were screened through 6.35-mm (¼-inch) hardware cloth mesh. All subsurface tests were then refilled following the completion of their excavation and the screening of the excavated sediments.

Areas within the survey area which evidenced prior disturbance or sufficient slope (greater than 20 percent) to preclude the presence of cultural or paleontological materials were not systematically investigated but were assessed on an area-specific basis using methods appropriate to the conditions encountered. Portions of the survey area with slopes greater than 20 percent were walked at 10-m to 15-m intervals to check for artifacts that may have been redeposited. All areas determined to be previously disturbed were clearly located on 7.5' quadrangle maps. These areas were then either walked at 10-m (32.8-ft) intervals or posthole tested at 20-m (65.6-ft) intervals to determine the nature and extent of the disturbance.

All archaeological sites and historic properties identified during the reconnaissance survey were documented and reported in accordance with established IDHPA guidelines including the completion and submission of appropriate site forms. Sites encoun-

tered during the course of the field survey were sequentially numbered, and all documentary descriptions, maps, and artifact analyses have been segregated accordingly. All previously unreported archaeological sites and isolated finds were issued a unique Area Of Scatter (AOS) number in sequential order of discovery. This number identified all artifacts, site descriptions and maps, and other materials associated with the site until official Indiana site numbers had been issued.

Close-interval pedestrian reconnaissance at 2-m intervals between transects was conducted within a given AOS to define site limits. All diagnostic prehistoric and historic artifacts were collected from each AOS defined during the reconnaissance survey. In instances of dense material scatters, a representative collection of artifacts present was made that included all temporally diagnostic artifacts and a representative sample of the other artifact types present at the site. In the instance of small or light density scatters, a total collection of artifacts was made.

A limited number of subsurface tests were excavated within each AOS as a means of assessing the nature of the sediments, the degree of site integrity, and the potential for the site to contain intact subsurface cultural deposits. These tests were excavated by posthole digger and were excavated until culturally sterile deposits were reached. These tests were excavated in such a manner that the range of depositional settings within a given AOS was sampled. All excavated sediments were screened through 6.35-mm (¼-inch) hardware cloth, and the soil profile was documented.

Each AOS was mapped in the field. The field sketch map illustrates relevant landscape and cultural features and site boundaries. The field sketch map includes a graphical scale and north arrow in addition to including distances to roads or other nearby cultural features when possible. A site description form has been completed for each AOS located during the survey and includes information on site location, estimated size, density of artifacts, presence of temporally diagnostic artifacts and their ages, field conditions, and other relevant data as to the nature of the site and its immediate environs. Each AOS was then plotted on the relevant USGS 7.5' quadrangle map, and UTM coordinates were calculated for the site center point. Color digital photographs of each site have been taken for archival purposes.

Laboratory Analyses

All recovered materials have been transported to laboratory facilities at the University of Illinois at Urbana–Champaign where they were washed, labeled, inventoried, analyzed, and prepared for curation. Inventory forms document artifact types, counts, and weights for each provenience, although weight is not calculated for historic artifacts. All recovered materials are classified initially as historic or prehistoric artifacts. More detailed secondary analyses are performed on both historic and prehistoric materials.

Prehistoric Artifacts

In general, lithic artifacts are divided into three broad categories: tools, manufacturing debris, and miscellaneous lithic material. Tools include those made from both chipping techniques (e.g., projectile points and scrapers) and grinding and pecking techniques (e.g., celts and axes). Tools can be of formal manufacture, such as the examples listed above, or of incidental manufacture (e.g., hammerstones and pitted stones). Manufacturing debris usually are composed of the waste materials (e.g., spent cores, flakes, and block shatter) generated from the production of chipped-stone tools. Miscellaneous lithic material can include fire-cracked rock, unmodified and tested chert chunks and nodules, and ocher. Fire-cracked rock is unintentionally produced debris that results from alternating processes of heating and cooling (Taggart 1981; Zurel 1981, 1982). Unmodified or minimally modified flakes, chunks, and nodules of chert represent raw material collected and reserved for tool production.

Debitage (flaking debris) categories comprise a majority of all the chipped-stone remains. These categories include block shatter, broken flakes, and whole flakes. The whole-flake classification was

used for items characterized by the presence of a bulb of percussion on the ventral surface and a striking platform. Whole flakes were further divided into primary, secondary, and tertiary flake types based on the amount of visible cortex present: 50 percent or more, less than 50 percent but greater than 0 percent, and 0 percent, respectively. Secondary characteristics also were assessed. Primary flakes tend to have a pronounced bulb of percussion, secondary flakes have a less pronounced bulb, and tertiary flakes are generally smaller than the other two flake types and often have a reduced or no bulb of percussion. Broken flakes are debris items that lack a platform or bulb of percussion or are too small to place accurately within the whole flake category. Block shatter is irregularly shaped and lacks flake and core characteristics. Bifacial thinning flakes have a distinct lip on their bulb of percussion, an angled striking platform, and negative flake scars on their dorsal surface. Related to debitage are cores, the parent material from which flakes are removed.

Formally flaked stone tools initially are divided into unifacial and bifacial categories. Unifaces show evidence for retouch on only one surface. Bifaces demonstrate retouch on both their dorsal and ventral surfaces. When possible, each tool is assigned to a more detailed morphological-functional use category. Unifaces are most commonly classified as scrapers, with the particular type determined by the placement of the edge modification. Bifaces can be placed into a number of distinct categories. Among these are such items as projectile points, drills, knives, scrapers, and thick and thin bifaces. The most recognizable of the chipped-stone tools are projectile points. Projectile points are symmetrically thinned bifaces that show evidence of hafting. These items are examined in detail and compared with projectile point types known from the Midwest. They are particularly important for the placement of sites within a cultural and temporal context (see Bell 1958, 1960; C. Chapman 1975, 1980; Justice 1987; Morrow 1984; Perino 1968, 1971). When possible, chert types and sources have been determined for chipped-stone tools.

The other tool types are largely descriptive in nature. Perforators are typically small, narrow, often bifacial tools. Knives are larger, thin bifaces with a low edge angle to facilitate cutting while scrapers have a higher edge angle to facilitate scraping. Thick and thin bifaces are not finished tools but represent stages in tool manufacture. A thick biface is one that has been modified, is not a finished implement, and is in need of further modification. Typically, the thick biface can be modified into a number of different tool types (Bradley 1975). Thin bifaces are the result of further modification of thick bifaces. They also are not finished implements, but their morphology indicates that they can be further modified into only a single tool category (Bradley 1975). Thin and thick bifaces are differentiated based on flake-scar morphology.

In analyzing the chipped-stone tools and lithic debris, a core-reduction model was followed (Collins 1975; see also Bradley 1975; Hayden 1980). Collins (1975) defines five stages of chipped-stone manufacture and use for the core-reduction model. These stages consist of acquisition of raw materials, core preparation-initial reduction, primary trimming, secondary trimming, and use-maintenance-modification. Each of these categories, called activity sets (except for raw material acquisition), is associated with waste by-products and objects that are further used or modified. Core preparation-initial reduction is a stage in which the core is shaped and flakes are detached. Suitable flakes may be retained and further used with the core being discarded, or both can be retained for additional modification. End products of this stage are primary flakes, block shatter, discarded cores, and thick bifaces. The next stage, primary trimming, is used to shape the object. Flakes can be retouched into usable tools, or thick bifaces can be flaked into thin bifaces. These activities result in the production of secondary flakes, retouched flakes, thin bifaces, and items broken during manufacture. Following primary trimming is the secondary trimming of thin bifaces. This stage produces tertiary flakes, finished tools, and items broken during processing. Finally, the tools are used, maintained, and perhaps modified. Bifacial thinning flakes are the most important waste by-product of tool maintenance activities, although they also could be produced while thinning thick bifaces.

Following this model, certain considerations have been made in the analysis of lithics. Cores, primary flakes, and block shatter are evidence of initial-stage reduction activities. Secondary flakes, tertiary flakes, and thick and thin bifaces evidence later-stage reduction activities. Bifacial thinning flakes are indicative of tool-maintenance activities. Since broken flakes can be produced by a number of prehistoric and modern processes, they are not considered when characterizing the chipped-stone tool production activities.

Less common, or perhaps less well recognized, is the use of a bipolar technique. In this technique, small cobbles are generally not well-suited for use in the direct hammer or core reduction technique described above, although a bipolar technique can be used to manipulate these items. When using a bipolar technique, the cobble is placed on an anvil and struck. This action yields bipolar debris and, eventually, a spent core. The flakes can either be discarded, used as is, or further modified into tools. The bipolar technique also produces pitting in anvil stones due to the striking force used.

The other class of lithic artifacts, ground-stone tools, consists of pecked and ground items generally made of metamorphic or igneous rock. Included in this category are items that are intentionally formed, such as celts and axes, and unintentionally formed, such as hammerstones, grinding stones, and pitted stones. Intentionally formed artifacts consist of items that were modified for a specific use. Unintentionally formed items have areas of pitting, battering, or smoothing that were caused by use. Definitions of the individual artifact categories are based on those used by other researchers in the Midwest.

Additional data also are gathered from prehistoric ceramics. Data collected for each rim or body sherd include temper type, temper density and size, surface treatment, cord twist, decoration, thickness, and vessel portion. For rim sherds, additional collected data include vessel form, rim shape, and lip shape and treatment, following standard definitions for these attributes (Rice 1987; Shepard 1965). Vessel profile definitions and terms following Ozuk (1990) are used in an attempt to standardize terminology.

Historic Artifacts

The major descriptive categories for historic artifacts are household ceramics, glass, metal, bone, and structural elements. These descriptive categories are then broken down into more specific categories that are described below.

Ceramics. The initial division of household ceramics is into refined and unrefined categories. Refined ceramics are finely made vessels, mainly tablewares such as plates, cups, saucers, bowls, and serving vessels. Refined ceramics include pearlware, whiteware, ironstone, and porcelain items. Pearlware has a soft paste and an overall bluish cast to the glaze that is not necessarily limited to puddling in crevices. Whiteware tends to have soft paste while ironstone is nearly vitrified. Whiteware tends to be whiter in color and thicker than pearlware. Transitional pearlwares/whitewares have intermediary characteristics. Porcelain artifacts are vitrified, have fine paste, are translucent, and are white in color. Common decorative treatments of these refined ceramics include handpainted, transfer printed, decal, and molded or embossed designs. Unrefined ceramics include redwares with red paste and clear lead glaze, yellowwares with yellow paste and clear glaze, and stonewares with coarse, vitrified paste. These represent mainly food storage and preparation vessels such as crocks, mixing bowls, jugs, and butter churns. The unrefined ceramics are often undecorated or have only simple design elements.

Ceramics are further subdivided into type categories on the basis of decorative treatment or, in the case of stoneware, the slip applied to interior and exterior surfaces. These ware and type categories have proven to be important temporal indicators. Chronological ranges associated with each ware and decorative treatment are based on Price (1981:24–48), Mansberger (1988:228–230), and South (1977: 210–212) with some refinements. Table 1 provides date ranges for ceramics based on the above sources.

Glass. Glass artifacts such as bottles, tablewares, and furnishings (lamps) also provide temporal and functional information for historical archaeological sites. Bottles are especially important since tech-

Table 1. Date ranges of refined ceramic types.

	Date Ranges		
Type	*South (1977:212)*	*Price (1981:42)*	*Mansberger (1988:228–229)*
Creamware	ca. 1750–1820		1762–1820
Pearlware			
Shell edge (blue/green)	ca. 1780–1830	ca. 1810–1830	1780–1830
Embossed edge[1]	ca. 1800–1820	ca. 1810–1830	1800–1830
Blue handpainted	ca. 1780–1820	ca. 1810–1830	1780–1830
Polychrome handpainted	ca. 1795–1815	ca. 1810–1825	1780–1830
Annular[2]	ca. 1790–1890	ca. 1810–1830	1790–1830
Transfer-print[3]	ca. 1795–1840	ca. 1810–1830	1790–1830
Whiteware			
Undecorated		ca. 1845–1870+	1830–1900
Shell edge		ca. 1830–1860	1830–1860
Embossed edge		ca. 1830–1850(?)	1840–1900
Blue handpainted		ca. 1830–1860(?)	1830–1850
Polychrome handpainted		ca. 1825–1860	1830–1860
Annular[2]		ca. 1830–1870+	1830–1860
Transfer print[4]		ca. 1825–1870+	1830–1860
Sponge		ca. 1835–1865	1840–1870
Lusterware			1830–1860
Handpainted and transfer printed			1840–1860
Ironstone			
Undecorated		ca. 1845–1870+	1840–1900
Embossed			1840–1910
Brown Tea handpainted			1860–1900
Transfer print			1880–1920
Decal			1890–1940

[1] including feather and scale patterns
[2] including mocha and worm designs
[3] including Willow pattern
[4] including flow designs

niques employed in their manufacture are datable (Lorrain 1968; McKearin and Wilson 1978). The turn of the twentieth century marks a change in glass manufacturing methods; bottles that are entirely machine made originate at that time. Bottle glass can be divided into two categories. These are bottles that are entirely machine made and those made with other techniques including hand blowing. Mansberger (1988:231–234) presents a detailed table describing the manufacturing attributes of glass and associated date ranges.

Metal. Metal artifacts represent a wide variety of activities at historic sites. Nails, screws, and machinery parts are commonly recovered. Less common are furniture and building hardware and tools. Buttons and buckles from clothing are also common. Nails are useful temporal indicators at historic sites. Wire-drawn nails became prevalent in the United States around 1900, and their presence on a site indicates a post-1900 occupation, just as the presence of ma-

chine-cut nails indicates a nineteenth-century occupation (Edwards and Wells 1993:58, 60).

Bone. Bone items can represent either the remains of subsistence activities or utilitarian objects such as combs and buttons. The methods of analysis vary, depending in which of these categories the artifacts fall.

Structural. Structural elements include such items as brick, concrete blocks, foundation stones, ceramic tile, and mortar. They suggest the former presence of structures and can provide details on construction techniques and materials.

It is apparent from this description that each category contains a wide variety of artifact types and functions. In this form, however, it is difficult to make meaningful interpretations regarding site function from the artifact assemblage. To do so, the classificatory system developed by South (1977) has been employed. Modifications have been made to reflect artifact assemblages typical of nineteenth-century sites in the Midwest. In this classification system, historic artifacts are organized into Artifact groups. South (1977) has defined nine such groups: Kitchen, Architecture, Activities, Arms, Personal, Clothing, Furniture, Tobacco Pipe, and Bone. Materials then are divided into Artifact classes within these groups and further subdivided into Material, Ware, and Type categories such as those described above.

The *Kitchen* group includes artifacts typically associated with food preparation and consumption. Within this group South (1977) has defined eight Artifact classes: Ceramics, Wine Bottle, Case Bottle, Pharmaceutical Bottles, Tumbler, Glassware, Tableware, and Kitchenware. To these classes are added the Liquor Bottle and Canning Jar classes. In contrast, Mansberger (1988) places liquor bottles in the Personal group. The Bone group (when items are food-related rather that utilitarian objects) also has been added to the Kitchen group.

The *Architecture* group includes artifacts associated with the construction and subsequent demolition of buildings rather than activities performed in and around structures. South (1977) defines five Artifact classes for this group, Window Glass, Nails, Spikes, Construction Hardware, and Door Lock Parts, to which has been added Construction Materials. Construction Materials include such items as bricks, foundation stones, concrete blocks, roofing slate, and composition shingles (or rolled roofing) used in the building of structures.

The *Activities* group contains a wide range of artifact classes relating to a variety of activities taking place at farmsteads that are not included in other artifact groups. South (1977) defines 12 such classes: Construction Tools, Farm Tools, Toys, Storage Items, Fishing Gear, Stub Stemmed Pipes, Stable and Barn, Ethnobotanical, Colono Indian Pottery, Miscellaneous Hardware, Other, and Military Objects.

The *Arms* group includes artifacts that are either integral parts of firearms or used in their manufacture. South (1977) defines three Artifact classes for this group: Musket Ball, Shot, and Sprue; Gunflints and Gunspalls; and Gun Parts and Bullet Molds.

The *Personal* group includes artifacts likely belonging to individuals that were, as the term suggests, for personal use. South (1977) identifies three artifact classes for this group: Coins, Keys, and Personal Items. We have added the Pipe class to this group.

The *Clothing* group includes artifacts related to the manufacture and use of clothing. South (1977) defines eight Artifact classes for this group: Buckles, Thimbles, Buttons, Scissors, Straight Pins, Hook and Eye Fasteners, Bale Seals, and Glass Beads.

The *Furniture* group includes artifacts used in the manufacture of furniture. South (1977) defines only one Artifact class, Furniture Hardware, for this group. Lamp glass has been added to this group.

Curation

All artifacts collected and record made during the course of this project will be curated at an appropriate Indiana institution following 36 CFR Part 79.

ENVIRONMENTAL SETTING

The INAAP survey area is located in Clark County, Indiana, within an upland setting on the west bank of the Ohio River valley. Thin glacial deposits and loess mantle the Paleozoic bedrock within the survey area, and the bluff line along the Ohio valley is heavily dissected by tributary streams that have incised deeply into the underlying karstic carbonate bedrock. Thin fluvial terrace formations of varying Pleistocene age are present between the base of the limestone cliff and the Ohio River. Hardwood forest communities were predominant within the area prior to Euroamerican settlement. Today, much of the more level portions of the landscape have been cleared and cultivated or developed, and forest is largely confined to steep slopes, sinkhole margins, and drainage ways.

Natural Setting

The INAAP is located along the southern border of the Till Plains Section of the Central Lowlands Province, adjacent to the Highland Rim Section and Bluegrass Section of the Interior Low Plateau Province (Fenneman 1938). The Till Plains Section of the Central Lowlands Province is characterized by a mantle of Pleistocene glacial till, outwash deposits, and glacial landforms atop the underlying Paleozoic bedrock. In addition, loess deposits are locally present within portions of the region. The project area is located near the southern boundary of Pleistocene glaciation and was itself covered in pre-Wisconsin glacial ice. Glacial till deposits are thin, and the region also has a thin veneer of loess. Topography in the area is largely controlled by the underlying Paleozoic bedrock, and the landforms are the result of degradational processes such as stream erosion and down cutting, weathering of the bedrock, and mass movement (Schneider 1966). The region is characterized by broad upland ridges that are heavily dissected along the major streams, with outcrops of shales, sandstone, and limestone/dolomite common in steep-sided ravines. Soils formed primarily beneath forest vegetation in the thin glacial till and loess and in weathered residuum and are generally silty in texture and moderately to strongly acidic. Vegetation was primarily mesic upland forest, with areas of bottomland forest present within the Ohio River valley and its major tributary streams.

Climate

The climate of southern Indiana has undergone cycles of warming and cooling throughout the late Pleistocene and Holocene epochs. Over 75,000 years ago the region was covered by the Illinoian glaciation, while by 8,000 years ago a warmer and drier climate, called the Hypsithermal (Altithermal) Interval, characterized the area. During the late Wisconsin glacial advance about 18,000 B.P., the ice front was located a short distance north of the project area, and the region experienced a periglacial climate. By around 16,500 B.P., climatic warming was underway as the ice sheets retreated northward. Cold cycles continued throughout the Holocene, most recently represented by the Little Ice Age during the nineteenth century. With the amelioration of the Little Ice Age, the past one hundred years or so have seen a general warming trend (Wendland 1978).

The modern climate is characterized as midcontinental, with four distinct seasons and a broad variation in seasonal temperatures. January is the coldest, with an average daily maximum temperature of 5°C (41°F) and a daily minimum average of -6°C (22°F). July is the warmest, with average daily maximum and minimum temperatures of 32°C (89°F) and 17°C (63°F) respectively. On average, Clark County experiences 155 frost-free days per year. Both tropical and arctic air masses traverse the region resulting in frequent changes in humidity and temperature throughout the year. Prevailing winds blow from the south for much of the year, except for the late winter when they are from the northeast and in the early autumn when they are from the southeast (Schaal 1974). On average, 1,080 mm (42.6 inches) of precipitation fall per year in Clark County. The precipitation is evenly distributed throughout the year with slight increases noted during the spring and early summer months (Nickell 1974). Snowfall averages approximately 310 mm (12.1 inches), with an average of only eight days

per year with a snow depth of 254 mm (1 inch) or more (Schall 1974).

Vegetation

Vegetational patterns across much of the midcontinent and within the INAAP have changed significantly since the Pleistocene as the climate moderated and gradually took on a more modern character (Holloway and Bryant 1985). At about 18,000 B.P., the southern margin of the Wisconsin ice sheet was located just to the north of the project area, and the region was tundra. This vegetational community was characterized by predominantly herbaceous taxa but also included birch, willow, spruce, and alder. As the ice retreated northward and the climate moderated, the tundra vegetation gradually gave way to coniferous boreal forest communities characterized by spruce and pine. By approximately 10,000 B.P., a mixed deciduous forest community characterized the region. Common taxa within the deciduous forest communities would include hickory, oak, elm, ash, maple, and tulip tree. During the Hypsithermal Interval, 8000–4000 B.P., the climate was warmer and drier than present. This climatic optimum would have resulted in the expansion of xeric forest communities at the expense of mesic and floodplain forests communities (Delcourt and Delcourt 1981).

The modern presettlement vegetation of the project area is classified by Braun (1950) as part of the Western Mesophytic Forest Region and by Greller (1988) as part of the mixed mesophytic subzonobiome. The forest communities of the region were somewhat transitional in nature between the mixed mesophytic forests to the east, beech-maple forest communities typical of areas to the north, and the oak-hickory forest that characterized regions to the west. Dominant canopy tree taxa within the upland forests would have been white oak, tulip tree, black oak, and several species of hickories – shagbark, pignut, and bitternut. In addition, red maple, sugar maple, black walnut, cherry, beech, and ash would have been minor constituents of the forest canopy. Forest composition within the region varied along with localized edaphic and topographic characteristics, and a mosaic of mesic and more xeric forest characterized the region. Eastern red cedar was common on dry rocky slopes underlain by Paleozoic limestone, while extensive floodplain forest communities covered the bottoms of the Ohio River valley. Floodplain forest communities would have included black willow, pecan, river birch, sweet gum, swamp cottonwood, eastern cottonwood, and swamp white oak in addition to an abundance of shrubby and herbaceous taxa.

Fauna

The extensive modification of the natural landscape since the region was settled by Euroamericans in the nineteenth century has altered species distribution and composition throughout southern Indiana. Many species were decimated in the middle to late 1800s through overhunting and landscape modification – principally clearing of forested areas for cultivation – which fragmented and degraded habitat. Small- to medium-sized mammals available for meat or pelts included eastern cottontail rabbit, woodchuck, fox squirrel, gray and red fox, raccoon, striped skunk, bobcat, river otter, beaver, and muskrat. Larger mammals included white-tailed deer, bison, black bear, and possibly the mountain lion (Jones and Birney 1988; Mumford and Whitaker 1982). Avifauna, such as ducks and geese, would have been plentiful within the Ohio River valley during their spring and fall migrations, and upland birds such as turkey and quail would have been year-round residents. Numerous other passerine species, including the now-extinct passenger pigeon, wading birds, and raptors were also residents of the southern Indiana region and could have been exploited for a variety of uses (Mumford and Keller 1984; Pough 1946; Schorger 1955). The Ohio River and its larger tributary streams would have contained a wide range of fish, mussels, reptiles, and amphibians. Larger fish taxa include numerous catfishes such as the flathead, blue and channel catfish, various suckers, bowfin, gar, and paddlefish. Other taxa include drum, black bass, white bass, perch, walleye, sunfish, and minnows (Gammon 1997; Walden 1964).

Geology

The unconsolidated surficial Pleistocene and Holocene deposits within the INAAP project area are underlain by Paleozoic carbonate rock strata of the late Silurian and Devonian periods. Late Devonian and early Mississippian shales underlie the western portions of Clark County. The formations include the middle Silurian Louisville Limestone, and the Jeffersonville and North Vernon Limestones of the Muscatuck Group dating principally to the middle Devonian. The Muscatuck Group contains thin interbeddings of shale and limited quantities of chert as well as evaporites such as anhydrite and gypsum. The carbonate rock of the Muscatuck Group ranges from fine-grained sandy dolomite or dolomitic quartz sandstone to light-colored to dark limestone that ranges from shaly to pure and granular. The Jeffersonville Limestone is exposed at the Falls of the Ohio, its type locality, located to the southwest of the project area where it unconformably overlies rock ranging from the early to late Silurian. The carbonate lithology of the Devonian Muscatuck Group is paraconformably overlain by the New Albany Shale, a late Devonian to early Mississippian stratum. These Paleozoic strata are between 30 and 36 m (98.4 and 118.1 feet) thick beneath the INAAP project area (Roberts 1996; Thompson 2002).

The carbonate rocks such as the Louisville Limestone, Jeffersonville Limestone, and North Vernon Limestone were formed from thin deposits of calcareous marine sediments deposited in quiet, near-shore waters of Paleozoic seas that covered the region. The Acadian Orogeny, a period of continental collision and uplift that occurred during the late Devonian through early Mississippian, led to the deposition of sand and silt in the inland sea that resulted in the formation of the New Albany Shale. Structurally, these strata are located on the western flank of the Cincinnati Arch, a large structural arch trending in a northeast-southwest direction from northern Alabama to the southern shore of Lake Erie. The rock strata on the western flank of the Cincinnati Arch dip gradually to the west toward the Illinois Basin where they are overlain by progressively younger strata. Older Ordovician limestone and dolomite are exposed at the center of the Cincinnati Arch in the form of the Nashville and Lexington Domes, both of which have been truncated by erosion. The gradual westward dip of the strata from the center of the arch has resulted in progressively younger rock outcropping or subcropping as one moves from east to west and away from the domes that lie at the core of the Cincinnati Arch (Roberts 1996). Microfaults and fractures resulting from the uplift of the Cincinnati Arch and subsidence of the Illinois Basin to the west, coupled with the general westward dip of the rock strata, may have played an important role in the location of the several deep stream valleys that cut across the INAAP project area. The deeply entrenched valleys of Jenny Lind Creek, Battle Creek, and Little Battle Creek all join the Ohio River at approximately right angles to the larger stream, and their locations may reflect zones of weakness which typify landscapes underlain by carbonate substrata. The Paleozoic bedrock strata are exposed at the west edge of the Ohio River valley in the form of a scarp 40–45 m (131.2–147.6 feet) in height. Karstic features such as sinkholes, subterranean drainages, caves, and rockshelters are common in the region.

The Paleozoic bedrock strata are unconformably overlain by unconsolidated deposits of Pleistocene age which form a thin veneer over the upland portions of the INAAP and may attain significant depths within the Ohio River valley. The Pleistocene deposits are primarily tills dating to the Kansan and Illinoisan stages of Pleistocene glaciation and predate 100,000 B.P. The Pleistocene sediments on the uplands consist primarily of gravel, sands, silt and clays. More recent Pleistocene deposits such as loess may be present across portions of the uplands, but it is likely that erosion has removed much of these younger sediments from the uplands and redeposited them within the deep stream valleys that drain the area. The narrow nature of the stream valleys likely subjects sediments deposited within to repeated cycles of deposition and erosion with the end result being that few stratified deposits likely exist within these drainages. Along the Ohio River, glaciofluvial and fluvial terrace deposits are present along the river and at the mouths of some of the tributary valleys. Due to the impoundment of the river by downstream locks and dams, however, the majority of the alluvial landforms within the valley have been flooded. Within

the INAAP project area, a terrace approximately 10–13 m (32.8–42.7 feet) above the present level of the Ohio River represents a late Pleistocene glaciofluvial terrace deposited around 20,000 B.P. A thin (up to 75 cm [29.5 inches]) layer of loess was subsequently deposited atop the Pleistocene outwash (Ray 1974). Younger terrace formations are present at elevations some 7.5 m (24.6 feet) or more below the high Pleistocene terrace and are composed of sediments that range in age from at least the mid-Holocene through the twentieth century. Considerable deposition of sediments at the mouths of tributary streams, in part the result of increased rates of erosion following the clearing and cultivation of the uplands, has mantled earlier deposits on some portions of the floodplain. Numerous mid-channel islands and point bars have been observed to form within the Ohio River channel over the past 50 years from recently eroded and transported sediments, attesting to the rate of sediment accumulation (Fraser 1986).

Glacial History

The INAAP project area is located within a region that was last glaciated around 100,000 B.P. during the Illinoian stage of the Pleistocene epoch which saw glacial ice advance farther to the south than any of the other Pleistocene ice sheets. The Illinoian advance reached the western portion of Clark County and left a thin deposit of till following its retreat. The till ranges in thickness from about 1.5–7.6 m (5–25 feet) across Clark County, with thicker deposits to the north. The maximal southern extent of the subsequent Wisconsin glacial stage was at least 50 km (31 miles) to the north of the INAAP project area. In addition to the Pleistocene till, several episodes of loess deposition during the Pleistocene and early Holocene added a thin veneer of silty loess to the landscape (Wayne 1966). The high terrace at the base of the limestone cliffs along the west bank of the Ohio River represents a Pleistocene glaciofluvial deposit. Much of the Pleistocene sediments within the valley, however, have been scoured away.

Physiography

The INAAP project area is located near the southern extent of the Till Plains Section of the Central Lowlands Province (Fenneman 1938). Schneider (1966) places the project area within the Muscatuck Regional Slope, near its boundary with the Scottsburg Lowland. The Muscatuck Regional Slope is a westward-dipping structural plain composed of the carbonate rock deposited during the Silurian and Devonian periods. The area is characterized by steep-sided, deep stream valleys and broad undulating to nearly flat uplands. The topography in the Muscatuck Regional Slope division is strongly influenced by the underlying bedrock topography due to the thin deposits of Pleistocene till atop the Paleozoic bedrock. The Scottsburg Lowland is described as a strike valley, a lowland whose topography is again largely determined by the lithology and structure of the underlying Devonian and Mississippian shales. Immediately to the west, a large east-facing cuesta rises up to 91 m (300 feet) above the Scottsburg Lowland. Composed of siltstones, shales, and limestone of the middle Mississippian, the Norman Upland is characterized by narrow flat uplands, deep V-shaped valleys and steep slopes. Gray (2000) places the project area with the Charlestown Hills Section of the Southern Hills and Lowlands Region. The Charlestown Hills Section covers most of central Clark County and joins the Scottsburg Lowland in southern Scott County to the north of the project area.

The deposition of Pleistocene till, glaciofluvial and alluvial terraces, and loess mantled the Paleozoic bedrock surfaces, and the ice sheets influenced the drainage patterns of the Ohio River, resulting in its carving a deep narrow valley through the Paleozoic carbonate rock, as well as the small tributary streams which occupy deeply incised narrow valleys. Erosional processes have been the dominant factor in the evolution of the upland landscape over the past 100,000 years following the retreat of glacial ice during the Pleistocene.

Soils

There are nine soil series recognized and mapped as present within the INAAP project area. These include Corydon, Crider, Jennings, Uniontown, Huntington, Avonburg, Hagerstown, Rossmoyne, and Wheeling series soils. The Corydon and Crider series soils are widely distributed within the INAAP project area. The soils of the Corydon, Crider, Jennings, Avonburg, Hagerstown, and Rossmoyne series are found in the uplands. The deep Huntington soils are formed in alluvial deposits on the Ohio River floodplain, Wheeling series soils are on terraces above the river, and the Uniontown series are distributed on stream terraces, (Nickell 1974). Characteristics of each these soils series are described below based on the Official Soil Series Descriptions (U.S. Department of Agriculture, Natural Resources Conservation Service 2002).

Crider series soils are generally deep, well-drained soils found on uplands. These soils formed within a loess mantle over the underlying limestone residuum on slopes ranging from 0–30 percent. A typical Crider soil profile exhibits a brown silt loam plow zone extending to about 20 cm (8 inches) below surface which is underlain by a yellowish brown silt loam Bt1 horizon extending to about 30.5 cm (12 inches) below surface. The Bt1 is characterized by a weak fine subangular block structure, few clay films on ped facies, and medium acidity. The underlying subsoil, extending to depths of up to 2.54 m (100 inches), ranges from silt loam in the upper portion to a heavy silty clay loam or clay in the lower portion. The upper portion of the subsoil is medium acid and ranges in color from brown to reddish brown. The lower portion of the subsoil, below 96.5 cm (38 inches), is dark red in color with a medium block structure and is strongly acid. Beneath the subsoil is a layer of limestone residuum. Crider soils formed beneath mixed hardwood forest vegetation.

Corydon series soils are shallow, well-drained to excessively drained soils formed within limestone residuum and thin loess deposits on hill slopes with 6–70 percent slopes. Corydon soils have a silty clay loam texture and are moderately slowly permeable. A typical Corydon profile exhibits an A–Bt1–Bt2–Bt3 profile over limestone bedrock. The A horizon sediments, extending from the surface to approximately 12.7 cm (5 inches) below surface, are dark grayish brown silt clay loam with abundant limestone residuum composing up to 20 percent of the soil volume. Owing to the abundant residuum, the Corydon A horizon sediments exhibit a neutral ph. The underlying subsoil sediments comprising the Bt1, Bt2, and Bt3 soil horizons are dark brown to dark yellowish brown silty clay with limestone residuum comprising up to about 14 percent of the soil volume. The subsoil typically extends to a depth of 43.2 cm (17 inches) below surface to the top of the limestone bedrock beneath.

Hagerstown soils are deep, well-drained soils formed within thin loess and materials eroded from particularly pure gray limestones on ridges and hill slopes up to 45 percent and within the adjacent swales. Rock outcrops are common within areas of the Hagerstown soils, and the depth to limestone bedrock is at least 1 m (39 inches). A typical Hagerstown profile exhibits a brown to dark brown friable silt loam Ap horizon extending approximately 20 cm (8 inches) below surface. The Ap horizon is underlain by a yellowish red clayey subsoil that extends to the underlying bedrock. The sediments are generally neutral in ph and have few coarse fragments. Clay content ranges between 35 and 60 percent. Hagerstown series soils formed beneath mixed hardwood forest vegetation.

The Jennings series soils are very deep, moderately drained soils that formed within loess deposited on Illinoian till and paleosols and residuum of the Devonian New Albany shale. These soils are found on summits, back slopes and benches within the dissected Illinoian till plain on slopes ranging between 0 and 12 percent. Jennings soils are characterized by a fragipan found at depths ranging from as little as 30.5 cm (15 inches) in eroded profiles to as much as 81.3 cm (32 inches) within more intact profiles. A typical profile is characterized by a silt loam Ap horizon and a silty clay loam to silt loam Bt horizon extending to the top of the fragipan or Btx horizon. The fragipan is characterized by a brittle moderately coarse prismatic structure, common clay films on ped facies, common manganese and iron concretions, and

strongly acidic ph values. The fragipan is underlain by as much as 1 m (39 inches) or more of clay loam subsoil atop the shale bedrock. The Jennings soils formed beneath mixed hardwood forest vegetation.

The Rossmoyne series soils are very deep moderately well-drained soils having a dense fragipan that formed within loess and Illinoian glacial till on nearly level to steeply sloping till plain. Rossmoyne soils differ from the above noted soil series in the presence of an E and BE horizon beneath the A horizon sediments. Where present, the E horizon is generally between 20.3 and 30.5 cm (8 and 12 inches) below surface, characterized by a weak platy structure and silt loam texture. A silt loam transitional BE horizon may also be present. The fragipan, or 2Btx1 horizon, is present between 58.4 and 93.9 cm (23 and 37 inches) below surface and is underlain by a 2Btx2 horizon extending to as deep as 1.42 m (56 inches) below surface. Together these two horizons comprise a fragipan of 25.4 cm–1.17 m (10–46 inches) in thickness that is underlain by clay loam subsoil (2Bt horizon) and a gravelly loam 2C horizon. The 2C horizon sediments are composed of a mixture of loess and erosional sediments derived from the Illinoian till.

The soils of the Avonburg series are very deep somewhat poorly drained soils that formed within loess and loamy to clay loam Illinoian till deposits on nearly level to gently sloping broad upland ridges. Avonburg soils are generally found on areas with less than 6 percent slope. These soils are characterized by a fragic Btg horizon about 53.3–93.9 cm (21–37 inches) below surface which inhibits root penetration and leads to a perched water table throughout much of the year. Depth to the water table ranges between 15.2 and 45.7 cm (6 and 18 inches) below surface within undisturbed and undrained Avonburg soils. Avonburg soils formed beneath mixed hardwood forest vegetation.

In contrast to the upland soils described above, the soils of the Uniontown, Wheeling, and Huntington series are found within alluvial and terrace settings. The Uniontown soils are well- to moderately well-drained silty soils formed within calcareous alluvium derived from loess on stream terraces having 0 to 30 percent slopes. Depth to bedrock is typically 3 m (10 feet) or greater. A typical Uniontown profile has a silt loam to silty clay loam plow zone extending from the surface to a depth of 22.9 cm (9 inches) underlain by a silt loam to silty clay loam subsoil (Bt1–Bt2–Bt3) extending to 86.4 cm (34 inches) below surface. Permeability is moderate to moderately slow and some Uniontown soils are subject to flooding.

Wheeling series soils are very deep well-drained soils formed within silty to loamy materials underlain by at least 1 m (39 inches) of noncalcareous sand or sand and gravel on terraces of the Ohio River. Slopes are generally slight, 0–8 percent, but range up to 55 percent. Wheeling soils are rarely subjected to flooding. A typical Wheeling profile has a brown silt loam, loam, sandy loam, or fine sandy loam Ap horizon extending from the surface to about 25.4 cm (10 inches) below surface and underlain by a dark yellowish brown E horizon. The E horizon sediments range from silt loam, loam, sandy loam to fine sandy loam and may be as much as 15.2 cm (6 inches) thick. The E horizon is underlain by a silty clay loam Bt horizon extending between 35.6 and 86.4 cm (14 and 34 inches) below surface. The argillic horizon is underlain by a very fine sandy loam BC1 horizon, which is in turn underlain by very gravelly sandy loam 2BC2 and stratified very gravelly sand 3C horizons to a depth of up to 1.83 m (72 inches) below surface.

The Huntington series soils are very deep well-drained silt loam to silty clay loam soils formed in alluvium on the Ohio River floodplain. Slopes are generally slight but range up to 15 percent. A typical profile has a very dark grayish brown silt loam Ap horizon extending from the surface to a depth of 27.9 cm (11 inches) underlain by a dark brown subsoil (Bw1–Bw2) extending to about 1.63 m (64 inches) below surface. The subsoil is a silt loam with a subangular blocky structure. The C horizon is a massive sandy clay loam. Huntington series soils formed beneath mixed hardwood forest vegetation.

Geoarchaeological Implications

Given the age of the stable upland surface which dominates the landscape within the INAAP, the potential for buried and stratified sites within the uplands is extremely limited. Sites will therefore be expected to be present at or very near the surface across most of the uplands. Thin aeolian or colluvial deposits may have been deposited atop prehistoric sites within portions of the uplands. The narrow tributary stream valleys that dissect the uplands may contain buried sites or components within their alluvial deposits, but the narrow nature of these tributary valleys and their potential for scouring by flood events limits the potential for site burial and subsequent preservation. The high terrace along the west bank of the Ohio River was formed prior to human occupation, and sites thus would be expected at or near the surface of this landform. Site burial by colluvium would be possible along the western portion of the terrace at the base of the limestone cliffs, Thin aeolian deposits may have buried sites with up to 1 m (39 inches of loess) on the terrace surface. On the Ohio River floodplain, the potential for site burial is high within the silty alluvial sediments (Stafford and Creasman 2002). At present, however, the floodplain is inundated by the normal pool elevation held behind the downstream lock and dam.

Drainage

The INAAP project area is located along the west bank of the Ohio River about 15 km (9.3 miles) north of Louisville, Kentucky, along a stretch of river that flows generally north-south. The Ohio River valley is approximately 2.8 km (1.7 miles) in width and is bounded by steep limestone cliffs up to 45 m (148 feet) tall. The river itself is about 1.6 km (1 mile) wide opposite the INAAP facility, leaving narrow alluvial terraces at the base of the limestone scarps. A large mid-channel island, Twelvemile Island, is located several hundred meters offshore from the southeast portion of the facility. The Ohio River valley in this region formerly contained a variety of backwaters, wetlands, and braided channels, all of which have been significantly altered by lock and dam construction and the creation and maintenance of shipping channels (Simons 1985). Several small, deeply incised creeks drain the uplands and join the Ohio River. From south to north these are Battle Creek, Little Battle Creek, and Jenny Lind Run. These drainages have eroded deeply into the Paleozoic carbonate bedrock and are characterized by steep to nearly vertical slopes, narrow alluvial terraces and bottoms, and the presence of caves and rockshelters within the limestone.

The project area is situated in the southwest part of the INAAP on rolling uplands of bedrock, pre-Wisconsinan glacial drift, and Wisconsinan loess. The INAAP is bordered on the east by the Ohio River and is drained by Jenny Lind Run, Little Battle Creek, Battle Creek, and Lentzier Creek, which flow east to southeast and empty into the Ohio River. Prior to Euroamerican settlement, vegetation in the area was characterized by a mosaic of eastern mixed mesophytic, beech-maple, and oak-hickory forests. The area represents a prime location for human settlement, and a review of the archaeological records for Clark County and adjacent counties indicates evidence of a long human occupation of the area extending from the Paleoindian period to recent times.

Paleoindian Period

The Paleoindian period marks the earliest well-documented occupation of the North American mid-continent by Native Americans. Paleoindian groups rapidly dispersed across a wide range of environments and settled a dynamic landscape undergoing rapid climatic/environmental changes that were linked to the retreat of the continental ice sheets northwards and increasing summer insolation (Haynes 1982; Shane 1987, 1994). Pleistocene mammalian fauna such as mammoth, mastodon, flat-headed peccary, Jefferson's ground sloth, giant beaver, tundra and woodland musk ox, caribou, bison, horse, and stag-moose either became extinct (through environmental changes or human impact) or moved northward with glacial retreat (McDonald 1994; Tankersley 1992). Munson (1985) has proposed a tripartite division of the Paleoindian period with Clovis, dating from 12,000–11,000 B.P., followed by Folsom/Cumberland at 11,000–10,500 B.P., and finally by Plano, 11,000–9000 B.P.

Paleoindian settlement-subsistence strategies responded to these environmental changes. Although Paleoindian settlement patterns are poorly understood, Tankersley (1992:11) argues that such patterns shifted from landforms with relatively low relief and open habitats to landforms characterized by more rugged terrain and closed habitats. He has proposed an Early Paleoindian "specialized hunter" settlement model based on the recognition of big game-related and lithic procurement-related activities. Specifically, Early Paleoindian sites appear restricted to areas that attracted and concentrated large migrating herd mammals, which included shallow river crossings, kettle lakes, saline springs, marshes, sinkhole ponds, and sandy terraces of major streams that created open vegetation patches. Also, they may be concentrated along overlooks (e.g., crests of moraines) of riverine (aquatic/wetland) habitats and in proximity to lithic outcrops (i.e., in the glaciated regions, lithic resources are found primarily in various unconsolidated secondary deposits). It is important to note that this model of primary dependence on big-game hunting contradicts ethnographic data that hunter-gatherer bands obtain most of their calories from gathering fruits, nuts, berries, roots, tubers, and starchy and oily seeds. Thus, they may not have been used as simply emergency or backup foods as Tankersley (1992:11) suggests.

It is generally thought that Early Paleoindian groups were highly mobile (nomadic), widely scattered, lightly equipped opportunists that lived in small egalitarian bands (Dragoo 1976:9; Fitting 1975: 38–57; Markman 1991:47; Mason 1981:82; Wright 1995:50–52). They moved on a seasonal basis to more fully exploit a wide range of animal and plant resources while also in pursuit of large herd animals. Their degree or magnitude of mobility is shown by the fact that fluted projectile points have been discovered hundreds of kilometers from where the raw chert materials were procured and where they were supposedly manufactured (Tankersley 1992; Tankersley et al. 1990). The specialized hunting of large migratory herbivore prey required a small, efficient toolkit consisting of bifacial and flake knives, a variety of scrapers, gravers, burin-like tools including wedges, spoke-shaves, drills, hammerstones, billets (made of antler, bone, ivory, or wood), blades struck from specially prepared polyhedral chert cores, and fluted projectile points that could easily penetrate

thick, tough animal hides (Mason 1981:86–89; Tankersley 1992:9–10, 1994:96–97).

The shift from Early to Late Paleoindian occurs about 10,850 years B.P. and is correlated with changes in the subsistence patterns that involved the replacement of big-game hunting with a broad-based utilization of closed-canopy, climax deciduous forest and forest edge ecotone resources (e.g., nuts, seed-bearing plants, smaller game). This economic shift may have been associated with a settling-in process reflected in the archaeological record as decreased mobility and raw material selectivity and increased stylistic diversity and frequency and size of sites. Site locations are most frequently in ecotone habitats such as along the edges of lakes and marshes in addition to river valleys and transitional zones along the edges of the till plains (Tankersley 1992). The post-Clovis Paleoindian groups manufactured a wider variety of stone bifacial and unifacial tool types than their predecessors, and these included large, bipointed alternately beveled bifaces, backed bifaces, end and side scrapers, backed and snapped unifaces, and hafted perforators. There was also an increase in regional and local fluted point types including Folsom, Cumberland, Barnes, Gainey, Crowfield, and Holcombe (Ford 1974:389; Tankersley 1994:100).

A transitional Paleoindian/Early Archaic complex, Dalton, has been identified across the midcontinent, dating between 10,500 and 9850 B.P. This complex has been defined largely on the basis of the presence of the distinctive Dalton projectile point and Dalton chert adze among lithic assemblages that are otherwise similar to those of the earlier Paleoindian period. Dalton populations are believed to have been the first to adapt to a fully post-glacial environment (Goodyear 1974; Morse and Morse 1983; Muller 1986).

Evidence for Paleoindian occupations in and near the project area is sparse, and sites of this time period are known solely from the recovery of diagnostic lithics from surface contexts. Points similar to the Cumberland and Clovis types have been recovered from Clark County (Swartz 1973), and a cache of fluted points was recovered from 12CL391,a possible Paleoindian habitation site in northern Clark County (Janzen 1977). Artifacts characteristic of the transitional Dalton complex have also been recovered from southern Indiana (Muller 1986).

Archaic Stage

The following Archaic stage has been subdivided into three periods: Early Archaic (10,000–8000 years B.P.), Middle Archaic (8000–5000 years B.P.), and Late Archaic (5000–2700 years B.P.). It is marked by the termination of the Pleistocene epoch and the extinction of megafauna across North America, with subsequent development of modern biotic regimes. Thus, the Archaic stages are noted for climatic/environmental and human adaptive change. As the mean annual temperatures increased, the tundra-like aspects of the periglacial regions retreated farther northward, to be replaced initially by coniferous forests and, subsequently, by deciduous hardwood forests and prairie (Kellar 1973). Important cultural trends recognized during these time periods include increases in population density, increased sedentism associated with an increase in the exploitation of aquatic/wetland resources of floodplain environments, and experimentation with technological innovations associated with horticulture activities, along with a marked regional divergence of material culture styles (Brown 1983; Brown and Vierra 1983; Jefferies 1995; Winters 1969).

Early Archaic Period

During the Early Archaic, small, highly mobile hunter-gatherer groups gradually became more geographically restricted. This settling-in process can be correlated with the trend toward greater utilization of the till plain/valley edge zone and aquatic/wetland areas (e.g., lakes, marshes) in a deciduous forest environment (Tankersley 1992). Although the hunting of white-tailed deer, cottontail rabbit, elk, bear, and turkey was a major subsistence activity for Early Archaic peoples, such a strategy appears to have been much more diverse and structured around the seasonal availability of resources in different environmental zones (C. Chapman 1975:128; J. Chapman 1975:232–233; Christensen 1986; Cleland 1966:92–93; Meltzer and Smith 1986). There was apparently little specialized exploitation of the floral

and faunal resources during the Early Archaic at sites such as Modoc Rockshelter, where subsistence remains indicate foraging for nuts and seeds and the exploitation of a variety of small mammals and main-channel and backwater lake fish species (Styles et al. 1983). Brown (1985:215) has proposed that Early Archaic camps be regarded as opportunistic types within a residentially mobile system due to the absence of substantial permanent structures.

The changes in settlement-subsistence strategies necessitated changes in lithic technology. The most recognizable markers of the Early Archaic tools are the projectile point types, which exhibit a variety of hafting element forms. Point types include lanceolate (Dalton Cluster and Hi-Lo Cluster), expanded to straight stemmed (Hardin Barbed), bifurcate-based (LeCroy Cluster, Rice Lobed Cluster, Kirk Stemmed Cluster, Kirk Corner Notched Cluster), and corner-notched (Thebes Cluster) varieties (Justice 1987; Kellar 1973:28-29; Vickery and Litfin 1994: 181-184). These often have broad, triangular as well as lanceolate blades with a high frequency of beveling that probably relates to other functions such as their secondary use as knives for butchering animals. Other lithic implements include end and side scrapers, *pieces ésquillées*, gravers, anvil stones, choppers, hammerstones, retouched flakes, large drills reworked from knives or spear points, adzes, and biface knives and preforms.

Evidence for Early Archaic occupation in the INAAP area is limited but seems to indicate that small, short-term settlements were utilized in the exploitation of a broad range of resources. Subsistence data are, however, poorly represented in excavated Early Archaic sites from adjacent northern Kentucky (Collins and Driskell1979). Diagnostic Early Archaic projectile points recovered from Clark County include Thebes, Kirk Corner Notched, and Bristol Diagonal Notched forms (Limp 1976; Noel 1986).

At the end of the Early Archaic in the Midwest, the effects of the Hypsithermal Interval (also known as the Atlantic, Optimum, or Altithermal climatic episode) were first felt, which is probably related to the replacement of the retreating Arctic air masses by the warmer and drier Pacific air masses prior to 6,000 years B.P. (Bartlein et al. 1984:372; Goudie 1992; Wendland 1978:278-280; Wendland and Bryson 1974:14). Mean temperatures were higher and mean precipitation lower than at any time during the Holocene resulting in the progressive eastward expansion of prairie communities from the Plains region (Hicks 1992; Markman 1991:54). The long-term warm, dry episode of the mid-Holocene (ca. 8500-5100 years B.P.) (Wendland 1978) resulted in the establishment of a savanna interspersed with oak groves and, thus, a depletion of upland resources. In the major river valleys there were marked increases in upland erosion of vegetation. The denuded ground created rapid deposition of colluvial sediments, with fluvial aggravation forming an alluvial fill that increased river meandering and the development of food-rich backwater lakes that were uncommon prior to 7000 years B.P. (Ahler 1984; Asch et al. 1972; Bettis and Hajic 1995; Brown and Vierra 1983; Styles 1986).

Middle Archaic Period

Increased sedentism appears to have been associated with these climatic/environmental changes as Middle Archaic peoples replaced a residential mobility (foraging) system with a logistically organized collecting system in which task groups were deployed from a central settlement or base camp (Brown 1985). The desiccation of the uplands and environmental pulls offered by abundant, diverse floodplain resources of major river valleys may have affected settlement patterns throughout the Midwest. Populations apparently lived for longer periods in larger multiseasonal base camps strategically located on or near the floodplain, as indicated by thickened midden deposits with clusters of pits, substantial structures, and diverse tool inventories at sites like Koster and Modoc, while conducting logistical forays by only a few individuals to extractive locales for specialized resource exploitation.

A variety of wild food resources was exploited from aquatic/wetland regimes of the floodplain (fish, freshwater mussels, turtle, marsh roots and tubers, wild seeds, and migratory waterfowl) and upland forest-prairie ecotone environments (white-tailed deer and nuts). The broadening of the subsistence base can be correlated with technological innovations. For

example, there was improved efficiency in hickory nut processing by using a boiling-skimming process rather than picking out the nuts by hand. The technique simply involved using a small, shallow, basin-shaped pit lined with hide, filling it with water that was brought to a boil by adding hot rocks, dropping pulverized nuts into the water, and then skimming off the nut meats and oil that rose to the surface (Talalay et al. 1984:352–353). This is shown archaeologically by the appearance of pits, presence of large quantities of fire-cracked rock, and a dramatic increase in hickory nut shell in Middle Archaic assemblages. Polished stone artifacts such as the full-grooved groundstone axe and the celt also first appear during this time period (C. Chapman 1975:158; Jefferies 1995; Stoltman 1978:715).

Middle Archaic chipped-stone tool assemblages often included a variety of side-notched projectile point or knife forms that continued to be produced into the Late Archaic. Raddatz, Godar, Black Sand, Faulkner, and Brannon are broad, side-notched, slightly concave- to straight-based types with heavy basal and lateral grinding characteristic of the midcontinent (C. Chapman 1975:158; Goldstein and Osborn 1988; Justice 1987; Morrow 1984; Waldorf 1987:91–92). In addition, bone tools such as pins, awls, fishhooks, and flint knapping tools are well represented within Middle Archaic assemblages.

Middle Archaic occupations are poorly represented within the INAAP region (Bennett 1988; Collins 1977) and within the Ohio River valley as a whole, and specifics on the nature of their adaptations, settlement patterns, and density of Middle Archaic populations are rare.

Late Archaic Period

The Late Archaic was a time of increasing cultural complexity and sedentism as it marks the transition from a hunting-gathering lifeway of the Middle Archaic to one of at least partial dependence on horticulture characteristic of the following Early Woodland period. The markedly increased archaeological visibility of Late Archaic sites is a phenomenon that occurs throughout the Midcontinent as a result of population growth, increased occupational intensity of sites, and cultural elaboration associated with a

more open, broadly based subsistence pattern including the earliest evidence of seed-plant cultivation (Caldwell 1958; Emerson et al. 1986; Griffin 1978:231; Jefferies 1995; Winters 1974). Another major factor responsible for the increasing archaeological visibility of Late Archaic sites is the attainment of more modern climatic/environmental conditions that, in turn, resulted in the stabilization of the landscape. The Sub-Boreal climatic episode (ca. 5060-2760 years B.P.) was responsible for a decrease in mean annual temperature to levels slightly lower than today and increased precipitation that led to more available surface water (Wendland 1978:280). Consequently, there was an expansion of food-rich deciduous forest, including nut producing tree species, and improved fishing and freshwater mussel collecting as a result of the reattainment of high water levels.

Experimentation, innovation, intensification of exchange networks, and development of complex mortuary ritual serve to describe Late Archaic times. This time period witnessed the first use of storage pits critical in leveling out subsistence crises during seasons of stress, winter and spring, when food was in short supply. Pecking, grinding, and polishing of nonchert stone rose to prominence as exemplified by an increase in ornaments (e.g., gorgets, pendants, beads), hunting and fishing gear (e.g., plummets, spear-thrower weights, ground slate knives), and varieties of milling stones to process vegetal foods and heavy wood working tools (e.g., three-quarter grooved axe). This time period also witnessed the first systematic long-distance trade in exotic raw materials. Atlantic and Gulf Coast marine shell, Ozark hematite and magnetite, Lake Superior copper, Upper Mississippi Valley and southeastern Missouri galena, Appalachian slate and steatite, bluish gray Indiana hornstone (also known as Harrison County or Wyandotte flint), and Ohio Flint Ridge chert are some of the items that are found in notable quantities outside the confines of their source areas, with their trade instrumental in the formation of alliances and use as power symbols in a common cosmology. The increased exchange in exotic materials is associated with the development of complex mortuary ceremonialism.

Several Late Archaic cultural manifestations have been identified in southern Indiana in the region of the INAAP study area. These include the Maple Creek Archaic, identified from the area of the Falls of the Ohio and eastward into southwestern Ohio; the Shell Mound or Green River Archaic, known from the lower Green River valley in Kentucky; and the Cave Archaic, also identified within Kentucky (Munson et al. 1977; Muller 1986). Several sites in the Falls of the Ohio area have been identified with Green River complex artifacts (Janzen 1977). Late Archaic components have been identified from caves and rockshelters, within tributary stream valleys, and on terraces and floodplain ridges within the Ohio River valley. Large sites within the Ohio River valley indicate a reliance on mussels and other riverine resources, while sites from the adjacent uplands are as yet poorly understood (Muller 1986). Bottomland Late Archaic sites in the region are characterized by often deep shell middens, abundance of fire-cracked rock and other indicators of intensive occupation, and appear to have been located with respect to several habitat zones allowing ready exploitation of a range of resources (Janzen 1977).

Woodland Stage

The Woodland stage has been subdivided into three periods, the Early Woodland, 2600-2100 B.P., the Middle Woodland, 2100-1650 B.P., and the Late Woodland, 1650-1150 B.P. The Woodland period is marked by a significant increase in cultural diversification, and a continuation of the trends initially identified during the Late Archaic - emerging social stratification, population increase, growing economic complexity, technological innovation, development and maintenance of long-distance exchange networks, and horticultural intensification.

Early Woodland Period

At most sites, an Early Woodland presence is indicated by weak-shouldered projectile points (or knives) that exhibit either a distinctive long, straight stem with heavy lateral grinding that is characteristic of the Early Woodland Stemmed Cluster (e.g., Kramer) or a contracting stemmed style characteristic of the Dickson Cluster (e.g., Dickson Contracting

Stemmed, Adena Stemmed, including the Waubesa type) (Justice 1987:184–198; Morrow 1984:49–53). Kramer points are commonly found with Marion Thick ceramics and are diagnostic of the Marion phase (Munson 1986). It is important to note that the contracting stemmed points are also associated with Middle Woodland components, and, consequently, they may have little utility in determining cultural relationships (Morrow 1984; Munson 1986:645). In the area of the INAAP, Early Woodland projectile points such as Kramer and Robbins have been recovered from Clark County, but the period is at present poorly represented (Limp 1976).

Middle Woodland Period

The following Middle Woodland period is characterized by the inception and expansion of the Hopewell cultural phenomenon. It is a time period that is well-known because of the data collected primarily from the lower Illinois River valley and the Scioto and central Ohio River valleys of southern Ohio. The trends of the preceding time periods continue with increasing sedentism, population growth, horticultural intensification, and investment in mortuary ceremonialism involving mound construction and a diverse assemblage of exotic ceremonial artifacts (Brose and Greber 1979).

Regarding plant usage during the Middle Woodland, there appears to be an intensified plant cultivation of the starchy seed complex consisting of knotweed, goosefoot, and maygrass, and very likely little barley. Two domesticated oily seeds (marsh elder and sunflower), two cucurbits (squash and bottle gourd), and tobacco were also cultivated. Maize has been recovered from Middle Woodland contexts and may have constituted a very minor cultigen during this period (Asch and Asch 1985; O'Brien 1987:183; Riley et al. 1994). Increased plant usage probably provided greater efficiency and stability of the subsistence economy thereby reinforcing the trend toward sedentary village life.

The chipped-stone tool assemblage could include lamellar flake blades and end scrapers on blades, side scrapers, bifacial knives, drills, perforators, gravers, wedges, adzes, gouges, blade cores, and a variety of hammerstones, grinding stones, and whetstones. Other ground-stone tools include full-grooved axes, pitted cobbles, celts, and pestles. Diagnostic Middle Woodland point types are of a corner-notched style including Snyders, Affinis Snyders, Gibson, Manker, Lowe Flared, Tamms and Norton (Justice 1987).

The Ohio River valley and adjacent uplands in the region of the INAAP project area contain scant evidence for the presence of Hopewellian Middle Woodland cultural expression. Burial mounds dating to this period have yet to be identified, and habitation sites are also unknown. Muller (1986) reports that an "undefined" Middle Woodland complex is present in the Falls of the Ohio area, one that does not exhibit any of the traits of its Scioto Hopewell neighbors to the east or those of Hopewellian populations in the lower Wabash River valley. The absence of Hopewellian stylistic markers in the region may be the result of Middle Woodland populations having a more conservative adaptation and economy along the lines of the preceding Early Woodland or Late Archaic. The absence of broad alluvial floodplains with abundant riverine and bottomland resources, apparent focal points of the Hopewellian economy, may also have served to slow the development of Hopewellian cultural expressions among the Middle Woodland population of the region.

Late Woodland Period

Late Woodland groups have been termed the "good gray cultures" (Williams 1963) because they were supposedly overshadowed by the former Hopewellian and subsequent Mississippian cultural climaxes. However, the Late Woodland stage is now understood as a time when important innovations were developed in terms of technology and settlement-subsistence patterns. Advances in cooking vessel technology (i.e., thinner walls) for preparing food can be correlated with a rapid increase in the economic importance of native-annual seeds that, in turn, may have increased population growth rates. Studies of faunal assemblages from Late Woodland sites in the American Bottom and lower Illinois

River Valley indicate localization and intensification in aquatic-resource procurement (O'Brien 1987). Resources that comprised the bulk of the Late Woodland diet include terrestrial animals (deer, turkey, raccoon, squirrel), mast resources (particularly hickory nuts), aquatic/wetland species (fish, waterfowl, turtles, freshwater mussels, and various aquatic and semiaquatic plants), and horticultural products (maygrass, goosefoot, knotweed, little barley, squash, sumpweed, and sunflower) (Munson 1988:9). Maize appears to have constituted only a minor subsistence element over much of the time period, perhaps becoming important sometime after A.D. 800 (Asch and Asch 1985; Munson 1988:10).

A variety of projectile point types is present during the Late Woodland. Many forms are small enough to suggest the adoption of bow-and-arrow technology, which may have been introduced around A.D. 600–700 (Fowler and Hall 1978). The bow and arrow permitted more efficient hunting in forested areas and proved important in raiding activities. Small, crude shallow-notched forms of the Scallorn Cluster and Madison and Hamilton Incurvate triangular points are common during this time period (Justice 1987).

The Late Woodland period, much like the preceding Early and Middle Woodland, is poorly represented in the Falls of the Ohio area and this period is virtually unknown within the INAAP study area. A possible Late Woodland stone fort was reported on the Devil's Backbone along Fourteenmile Creek just north of the present INAAP survey area. While early reports of this structure appear to have been exaggerated, the site contained a stone enclosure containing five mounds and was similar in construction to stone forts identified in southern Illinois. Prehistoric artifacts, including ground stone tools, triangular projectile points, chert debitage and other materials were recovered. By the 1930s, however, the site had been destroyed by agricultural activity and quarrying and its affiliation with the Late Woodland remains unclear (Cox 1874; Janzen 1972).

Mississippi Period

The succeeding Mississippi period, beginning about A.D. 1000, is better represented in the INAAP region with several Mississippian manifestations present within the Ohio River valley including the Fort Ancient cultural manifestation and several Middle Mississippian cultural variants. Fort Ancient sites are principally located to the east of the INAAP in southeast Indiana, Ohio, Kentucky, and West Virginia, while Middle Mississippian cultures were located within the Mississippi River valley and the lower Ohio River valley to the west. Mississippian cultural variants present in southern Indiana and northern Kentucky include the Kincaid–Angel, Green River, Vincennes, and Falls Mississippian. Mississippian cultures are best understood as an adaptive system based on intensive agricultural production from bottomland settings coupled with the exploitation of a limited range of productive wild resources such as backwater species of fish and seasonally available floral resources and characterized by a ranked social organization (Muller 1986; Smith 1978).

The Falls of the Ohio Mississippian variant is known from a number of small, widely scattered sites located within and adjacent to the relatively wide Ohio River floodplain in the vicinity of Louisville. This floodplain expanse is bounded both upstream and downstream by a narrow gorge with little floodplain development. The type site, the Prather site, consisted of a number of small, rectangular wall-trench structures surrounding central hearths, and having burials interred beneath the structures. Ceramics are shell-tempered, and maize remains were identified (Griffin 1978; Janzen 1972). Lilly (1937), reported a string of Mississippian villages and associated mounds along the Ohio River in Floyd County to the west of the INAAP. Many of these sites, however, have been destroyed prior to professional archaeological attention. Griffin (1978) identifies the Falls of the Ohio area as the easternmost extent of the Middle Mississippian culture area, a conclusion supported by an absence of Mississippian sites upstream from Clark County (Munson et al. 1977).

Protohistoric and Historic Period

The Protohistoric and Historic Native American periods in the area of the INAAP are, not surprisingly, poorly understood, and little substantive information regarding the habitation of the region by historically known tribes is available. The Ohio River would have been a major transportation route, and it is likely that many historically known tribes would have traversed the region, especially during periods of upheaval and population movements during the historic period as Euroamericans penetrated deeper into the North American continent. The favorability of the area for travel may have resulted in its becoming a region of transient usage rather than a habitation are during this time. The Piankashaw and Shawnee were known from areas to the west near the Wabash River, while the Delaware and Shawnee were found to the east in southeast Indiana and southern Ohio. Guernsey (1942) reports that sites attributed to the Shawnee were visible in the Falls of the Ohio region during the late 1800s and indicates that this tribe inhabited the area prior to Euroamerican contact.

The historic period in Indiana began with encounters between Native Americans and Europeans in the late seventeenth century. Although others may have visited areas that later became part of Indiana, the first documented European presence was in 1679 when Robert Cavelier, Sieur de la Salle, made a portage between the St. Joseph and Kankakee Rivers in the vicinity of South Bend (Barnhart and Riker 1971:62). While several villages of the Miami, Wea, Potawatomi, Piankeshaw, Kickapoo, Mascouten, Delaware and Shawnee were documented in Indiana during the eighteenth century, the villages were located primarily in the South Bend area or along the Wabash River drainage extending from what is now northeast Indiana to the western border of the state. No permanent villages are shown for the Falls of the Ohio region in Indiana (Tanner 1987). The region could have been included in the Native American mixed economy of corn agriculture, hunting, fishing, and gathering of seasonally available resources. The area may have been in continuous use during the late

prehistoric to historic period, since the Buffalo Trace, extending from the Falls of the Ohio to Vincennes, is described as a prominent route as early as 1800 (Wilson 1991:1, 16–17).

French posts such as Oiuatenon and Vincennes were established during the eighteenth century to try to maintain military control over the vast territory they claimed in North America. The French needed the cooperation of tribal groups as trading partners and military allies against the British, who came into the Ohio River valley as early as 1700 (Barnhart and Riker 1971:67–68). The Ohio River valley became part of British territory in 1763 at the end of the French and Indian War, and then came under American control in 1783. From 1783 to 1784, what later became the Indiana Territory was part of the Commonwealth of Virginia. The land was ceded to the federal government in 1784 and became part of the Northwest Territory (Indiana Historic Sites and Structures Survey 1988:xiii). In 1779 and 1780, the General Assembly of Virginia passed an act to provide land bounties to officers and soldiers who has served in the Revolutionary War.

During the last quarter of the eighteenth century, a series of military campaigns had more to do with the continuing interests of the groups competing for control over the Northwest Territory than with the American Revolution. The French had developed personal and familial ties with Native Americans, while the British wanted to control hunting lands and trade with the Indians. Americans wanted to acquire the land for speculation and settlement. The military expeditions increased in frequency in the 1790s, with a triumph for combined tribal groups over General Arthur St. Clair in 1791. However, the Indian loss at the battle of Fallen Timbers in 1794 signaled the end of the Native American struggle to maintain control over of the area northwest of the Ohio River (Tanner 1987:68–69).

The area chosen for those who served with General George Rogers Clark during the Revolutionary War was 150,000 acres extending northwest from the Ohio River, adjacent to the falls in what later became Clark County, Indiana. Although the town of Clarksville was platted in 1784 opposite the lower part of the falls, and survey of Clark's Grant was completed in 1786 by William Clark, the land was not relinquished by Native Americans until the treaty of Greenville in 1795 following the battle of Fallen Timbers (Wilson 1991:57–58).

With the establishment of Clark's Grant at the turn of the nineteenth century, this area became the first in which American settlers could legally cross the Ohio River for settlement. An area that had been prominent as a link between the Ohio River and an important overland route became the location of rapid and diverse settlement on the American frontier. The early decades of the nineteenth century saw many developments in Charlestown and Utica Townships in Clark County, which was established by Governor William Henry Harrison from the eastern half of Knox County. Charlestown Landing, also known as McDonald's Ferry, began operation even earlier in 1796. Charlestown, established in 1808, was the township's commercial center and only town until 1854. By 1815, there were ten licensed ferries operating in Clark County. Schools were first established in Charlestown Township in 1803 and in Utica Township in 1811. A stone mill was built on Fourteenmile Creek in 1800, and horse mills were established in several locations. In addition, a still house and a tannery were also built and operated in Utica Township (Anonymous 1882:342–402).

An effort was made in Indiana to construct a canal around the barrier presented by the more than 2-mile-long Falls of the Ohio. Despite a more favorable configuration for navigation and the 1817 establishment of a company by the state legislature to build a canal, a commission decided upon the Kentucky side of the river (Anonymous 1900), and the Louisville and Portland Canal was completed in 1830. As a result, Louisville's development surpassed that of towns on the Indiana side of the Ohio (Simons 1985:82).

Clark County residents figured prominently in one of the most important issues of the new Northwest Territory, the question of allowing slavery within the territory. Although the language of the Northwest Ordinance of 1787 prohibited slavery, later territorial legislation permitted long-term contracts with slaves brought into the territory, in effect allowing inden-

tures for these individuals and their children for decades. Citizens of Clark County met in 1807 to protest the proslavery position of the territorial government (Cayton 1996:190–191). With many of the early settlers in Clark County former Kentucky residents, this sentiment was more due to the threat of an influx cheap labor and opposition to the territorial government than to a desire for all blacks to be free (Cayton 1996:245–246). The antislavery representatives won out, and Harrison resigned as governor in 1812. Indiana statehood was established in 1816, with Jonathan Jennings elected at the first state governor.

Clark County was organized in 1801, with Springville serving as county seat for only a year before Jeffersonville, earlier the site of military fortifications, became the county seat. For most of the nineteenth century (1811–1878), the more central location of Charlestown served as the county seat, although it was returned to Jeffersonville in 1878 (Indiana Historic Sites and Structures Inventory 1988:xiii). Although the original area of Clark County was later reduced with the formation of Washington, Jefferson, Floyd, and Scott Counties, by the 1820s, its configuration was similar to that of the county today (Pence and Armstrong 1933: 256–275). The population of Clark's Grant in 1784, when Virginia ceded its claim to the Northwest Territory, was 929 whites (Cayton 1996:178). By 1820, the population of Clark County was 8,700 (Indiana Historic Sites and Structures Survey 1988:xiii), and by the turn of the twentieth century, the county population was more than 30,000 (Cottman and Hyman 1915:227).

Some developments in Clark County through the nineteenth century were dispersed rather than concentrated in urban areas. Lime production began in southern Indiana in the late eighteenth century with "groundhog" kilns, temporary or limited-use kilns built into hillsides to remove carbon dioxide from the abundant dolomitic limestone. Commercial kilns, such as that established by the Utica Lime Company, operated in Clark County beginning in 1870 (Striker et. al. 2000:17–18). In addition, by 1900 there were 19 cement mills within the county, employing about 4,000 men in producing up to 15,000 barrels of cement a day or more than 5 million per year (Anonymous 1900). Diverse institutions in Jeffersonville served to anchor its development through the nineteenth century, beginning with the state prison in 1822 (Cottman and Hyman 1915:227). The Howard shipyards, started by James Howard in the 1830s at Jeffersonville, became the premier inland boat builder in the nation, building around 3,000 steamboats during its 107-year history (Indiana Historic Sites and Structures Inventory 1988:xiii). In addition, the United States Supply Depot was established at Jeffersonville during the Civil War, with buildings later constructed for the manufacture and storage of quartermaster's supplies for army posts in the United States and its territories (Anonymous 1900).

With the need for a munitions factory recognized by the United State in the late 1930s, Congress authorized spending for the construction of explosive and propellant factories in 1939. The first new factory, the Indiana Ordinance Works, was built by DuPont beginning in 1940. Subsequent additions to the plant near Charlestown occurred during the 1940s, with their consolidation as the Indiana Arsenal in 1945 and the Indiana Ordinance Plant in 1961. The early 1940s plants at Charlestown served as prototypes for other world War II-era ammunition factories (Peter et al. 1995:I–23 –I–25).

RESULTS OF INVESTIGATIONS

The original Clark's Grant plat (English 1896) does not depict any structures in the project area (Figure 3). The 1876 atlas of Clark County (Andreas 1968) shows a church in the project area in Clark's Grant Tract 54 (Figure 4). This church, which has since been razed, was located adjacent to Union Cemetery, within an area currently surrounded by chain-link fencing. The 1937 15' topographic map shows eight residences in the survey area, of which seven were identified in the field as sites 12CL640, 12CL641, 12CL642, 12CL643, 12CL645, 12CL658, and 12CL650 (Figure 5). These sites are discussed in detail below.

At the time of survey the project area consisted of pasture and various INAAP facilities (e.g., structures, roads, parking/storage lots). Surface visibility in the pastures was generally below 30 percent. As described in the Research Methods section, areas that did not exhibit obvious evidence of disturbance were investigated by screened posthole tests at 10-m intervals. Thirteen archaeological sites were identified as a result of the survey.

12CL640

Site 12CL640 (field number AOS 1), which measures approximately 15-x-30 m, is an historic site located on a subtle upland ridge approximately 60 m north of Patrol Road and 150 m east of State Route 3/62 in the southwest corner of the INAAP (Figures 2 and 6). It is located in an area currently used as pasture, and at the time of the survey vegetation cover consisted of grasses and weeds with no surface visibility. Historic artifacts were recovered from ten screened posthole tests. With the exception of two large concrete fragments at the south edge of the site, no architectural remains were identified at the site. This area has been used by the INAAP as a dumping and burial ground for metal canisters, and several of these were observed throughout the site area. The ground surface immediately south of the site is very uneven and appears to have been extensively disturbed.

A total of 45 artifacts was recovered from 12CL640 consisting of 17 brick fragments, 9 coal fragments, 5 pieces of flat glass, 3 undecorated whiteware fragments, 1 whiteware fragment with blue-green decal decoration, 2 machine-cut nails, 2 fragments of clear curved glass, 2 mortar fragments, 1 fragment of salt/Albany stoneware, 1 piece of plastic, 1 ironstone rim fragment, and 1 fragment of semiporcelain with decal decoration. Approximately half of the artifacts (47 percent) were found from 0 to 10 cm below surface, with the remainder from 10 to 20 cm below surface.

No structure is depicted at this location on the 1876 Clark County atlas (Figure 4). The 1937 15' topographic does indicate a structure here, suggesting that the site dates to the late nineteenth century at the earliest through the early twentieth century (Figure 5). Artifacts found at this site support this temporal affiliation.

In summary, both the artifact assemblage and historic documents suggest a late nineteenth- through early twentieth-century temporal affiliation for this site. Based on this and severe disturbance of the area by INAAP activity for approximately 60 years, 12CL640 is not considered eligible for listing in the National Register of Historic Places, and no further work is recommended.

12CL641

Site 12CL641 (field number AOS 2) is an historic site located on the crest of a prominent upland ridge approximately 150 m north of Patrol Road and 450 m east of State Route 3/62 in the southwest corner of the INAAP (Figures 2 and 7). The site measures approximately 30-x-10 m and consists of nine positive posthole tests located in a pasture. Vegetation cover at the time of the investigation consisted of grasses and weeds with no surface visibility.

A total of 33 artifacts was recovered to a depth of 30 cm below surface. Artifacts recovered from the site

Figure 3. Sections from plat of Clark's Grant.

Figure 4. Sections from 1876 map of Clark County, Indiana.

Figure 5. Sections from the 1937 USGS 15' Jeffersonville topographic map.

Figure 6. Sketch map of 12CL640.

Figure 7. Sketch map of 12CL641.

consist of 18 coal fragments, 5 brick fragments, 5 machine-cut nails, 2 fragments of curved aqua glass, 1 fragment of brown bottle glass, and 2 wire fragments. Approximately half (48 percent) of all artifacts were found between 0 and 10 cm below surface, 12 percent from 10 to 20 cm below surface, and 39 percent from 20 to 30 cm below surface. No architectural remains were located at this site.

The 1876 Clark County atlas does not depict a structure at this location, but one is indicated on the 1937 15' topographic map (Figures 4 and 5). Based on historic maps and artifacts, 12CL641 most likely represents a late nineteenth- through early twentieth-century occupation.

In summary, both the artifact assemblage and historic documents suggest a late nineteenth- through early twentieth-century temporal affiliation for 12CL641. Based on this, the paucity of artifacts, and demolition associated with the construction of the INAAP, the site is not considered eligible for listing in the National Register of Historic Places, and no further work is recommended.

12CL642

Site 12CL642 (field number AOS 3) consists of two positive posthole tests on the north slope of an upland ridge approximately 70 m south of Safety Road and 100 m east of State Route 3/62 in the west-central part of the INAAP (Figures 2 and 8). The site measures approximately 5-x-5 m and is located in a pasture. At the time of the survey, the site was covered in grass and weeds with no surface visibility. The site produced one brick fragment and one piece of coal, both from 0 to 10 cm below surface. No architectural remains were identified.

A structure is depicted at this location on the 1937 15' topographic map but not earlier (Figures 4 and 5). It is likely that the paucity of material is due to thorough demolition during construction of the INAAP. Based on the paucity of material found and severe disturbance, 12CL642 is considered ineligible for listing in the NRHP. No additional archaeological investigations are recommended.

12CL643

Site 12CL643 (field number AOS 4) site consists of historic artifacts and architectural remains located on the crest of an upland ridge spur above a steep-sided ravine approximately 70 m southwest of Utica Road and 200 m southeast of Patrol Road and State Route 3/62 (Figures 2 and 9). The site area is generally open pasture with a few scattered maple trees and patches of day lilies and sweet peas. At the time of survey the area was covered with weeds and grasses with no surface visibility. The site measures approximately 30-x-100 m.

Seven positive posthole tests were excavated at this site producing 14 artifacts. The artifact assemblage from 12CL643 consists of nine brick fragments, two pieces of coal, one fragment of clear burnt glass, one fragment of plain ironstone, and one corroded square nut with bolt. Nearly 60 percent (n=8) of this material was found between 0 and 10 cm below surface. The remainder was recovered from between 10 and 20 cm below surface. In addition to the artifacts recovered from subsurface tests, a brick-lined cistern was located at the southwest edge of the site. This feature is approximately 2 m in diameter and is visible as two to three courses of bricks projecting just above ground level. Finally, a very slight depression in the center of the site area was noted, but no cultural debris were recovered from tests in this area.

No structure is depicted at this location on the 1876 Clark County atlas, while the 1937 15' topographic does indicate a structure here, suggesting that the site dates to the late nineteenth century at the earliest through the early twentieth century (Figures 4 and 5). Artifacts found at this site support this temporal affiliation.

In summary, both the artifact assemblage and historic documents suggest a late nineteenth- through early twentieth-century temporal affiliation for this site. Based on this and severe disturbance of the area by INAAP activity for approximately 60 years, 12CL643 is not considered eligible for listing in the National Register of Historic Places. No further work is recommended.

Figure 8. Sketch map of 12CL642.

Figure 9. Sketch map of 12CL643.

12CL644

Site 12CL644 (field number AOS 5) is a surface scatter of prehistoric lithic artifacts located in a cow trail that traverses a ditch between a railroad freight yard and the site of a razed INAAP structure (Figures 2 and 10). It is situated between a set of railroad tracks and Waterline Road, approximately 350 m northwest of Union Cemetery. A small scatter of lithic artifacts, measuring approximately 1.5 m in diameter, was found on the surface of the cow trail. Surface visibility at this location was 100 percent. Five artifacts were found at this location consisting of one primary chert flake, one tertiary chert flake, one chert bifacial thinning flake, one broken chert flake, and one pitted cobble. Four screened posthole tests were excavated immediately west of the surface scatter in an open pasture with scattered trees. An INAAP building formerly located in this area has been razed, and ground cover currently consists of grasses and weeds with less than 25 percent surface visibility. Three of these tests produced no prehistoric material, while the fourth produced an immature deer metatarsal which appears recent. All of the tests produced dense gravel similar to that used in the railroad bed.

Site 12CL644 is located in an area that has been severely disturbed by several processes, including construction of the railroad freight yard, construction and subsequent demolition of an INAAP structure, cattle traffic, and pre-INAAP agricultural activity. The original topography of the area as depicted on the 1937 15' topographic map consisted of an upland ridge immediately to the northwest of an intermittent drainage, and this has been drastically modified by these various processes which in turn have compromised the depositional integrity of the site area. Given the types of disturbance in the site area, it is unclear if the material represents a highly a disturbed prehistoric site or, alternatively, material that has been secondarily deposited by INAAP construction and demolition activity over the past 60 years. Given the proximity of the freight yard to the site, it is highly probable that the artifacts were redeposited with a load of gravel used to construct the rail bed. Based on the high degree of disturbance, which has severely impacted the depositional integrity of the area, and the possibility that the material is in secondary context, 12CL644 is considered ineligible for listing in the NRHP. No additional work is recommended.

12CL645

Site 12CL645 (field number AOS 6) consists of prehistoric and historic material located on a prominent knoll in the northwest corner of the survey tract, approximately 70 m southwest of Waterline Road and 280 m east of State Route 3/62 (Figures 2 and 11). It measures approximately 50-x-60 m, is located in a pasture with open woodlands, and is bordered on the west by a more densely wooded intermittent drainage. Surface visibility at the time of the survey was approximately 10 percent. Cattle intensively utilize this area for shade and water.

Site 12CL645 consists of both positive subsurface tests and architectural debris. Nine screened posthole tests produced cultural material from depths of 0 to 20 cm below surface. Nineteen artifacts were collected from these tests, consisting of eight pieces of coal, five brick fragments, one corroded wire-drawn nail, one corroded machine-cut nail, one salt-glazed stoneware fragment, two pieces of clear flat glass, and one tertiary chert flake. Three posthole tests produced tiny, pulverized brick fragments which were noted but not collected. Also located by subsurface testing but not collected was a large, flat, corroded metal bar with a square hole at one end. Approximately 70 percent (n=13) of the artifacts were found between 0 and 10 cm below surface. In addition to subsurface material, cultural debris were found on the site surface, consisting of five large pieces of concrete and cut limestone blocks. One of these blocks forms a 90-degree angle. The blocks appear to be foundation remnants and appear to have been only minimally displaced.

The single chert artifact found at 12CL645 is not culturally or temporally diagnostic. The 1876 Clark County atlas does not depict a structure at this location, but one is indicated on the 1937 15' topographic map (Figures 4 and 5). Other archival information tentatively identifies this site as the Connover/Barnett place and indicates that a brick

Figure 10. Sketch map of 12CL644.

Figure 11. Sketch map of 12CL645.

house of unknown date once stood here (Peter et al. 1995). Based on historic maps and artifacts, the historic component of 12CL645 most likely represents a late nineteenth- through early twentieth-century occupation which was razed during construction of the INAAP.

In summary, both the artifact assemblage and historic documents suggest a late nineteenth- through early twentieth-century temporal affiliation for the historic component at 12CL645. The tertiary chert flake is not temporally or culturally diagnostic, and the depositional integrity of the prehistoric component of the site has been compromised by house construction, demolition, and agricultural activity. Based on the paucity of historic and prehistoric artifacts, a late nineteenth- through early twentieth-century historic temporal affiliation, demolition associated with the construction of the INAAP, and severe disturbance of prehistoric deposits, the site is not considered eligible for listing in the National Register of Historic Places, and no further work is recommended.

12CL646

Site 12CL646 (field number AOS 7) is a small scatter of chert chipping debris located on an upland ridge above a steep wooded ravine that leads to a sinkhole (Figures 2 and 12). It is situated approximately 150 m northwest of North 4th Street in the northeast part of the INAAP. The site measures approximately 10-x-40 m and consists of two positive posthole tests. It is located in a pasture which had no surface visibility at the time of survey. Two secondary chert flakes were found at this site, one from 0 to 10 cm below surface and the other from 10 to 20 cm below surface. Neither artifact is temporally or culturally diagnostic. All brackets of the two positive posthole tests were negative. Soils at this location are heavily eroded, with an abrupt plow zone to B horizon transition at approximately 10 cm below surface. Based on the paucity of artifacts and disturbance due to agricultural practices and erosion, 12CL646 is considered ineligible for listing in the National Register of Historic Places. No additional work is recommended.

12CL647

Site 12CL647 (field number AOS 8) is an isolated broken chert flake from a posthole test in a slight saddle between two upland ridges (Figures 2 and 13). It is approximately 45 m west of a wooded ravine and sinkhole and 90 m northwest of North 4th Street in the northeast part of the INAAP. The single artifact, which is located in a pasture with no surface visibility, was found at a depth of 10 to 20 cm below surface. All brackets of the positive posthole test were negative. Based on the paucity of artifacts and disturbance due to agricultural practices and subsequent erosion, 12CL647 is not considered eligible for listing in the National Register of Historic Places, and no additional work is recommended.

12CL648

Site 12CL648 (field number AOS 9), which measures approximately 70-x-75 m, consists of 18 positive posthole tests and 3 surface features on a prominent knoll approximately 15 m east of Patrol Road and 300 m southwest of Adams Cemetery (Figures 2 and 14). At the time of the survey, the site area consisted of pasture with grass and weed vegetation cover. Surface visibility was approximately 10 percent. A total of 66 artifacts was recovered from the site, consisting of 43 coal fragments, 5 brick fragments, 3 limestone fragments, 3 machine-cut nails, 2 clinkers, 2 fragments of mortar, 1 fragment of undecorated whiteware, 1 polychrome handpainted whiteware fragment, 1 fragment of Albany stoneware, 1 salt-glazed stoneware fragment, 1 salt/Albany stoneware fragment, 1 stoneware pipe bowl fragment (light brown glaze), 1 fragment of clear flat glass, and 1 fragment of clear curved glass.

In addition to the positive subsurface tests, three historic features were documented at 12CL648.Two of these are small brick-lined depressions located on a slope near the east edge of the site. Each measures approximately 1 m in diameter. The third feature is a large brick and mortar cistern located at the south edge of the site. Surface grading has truncated the top of this feature, exposing a circular course of bricks.

Figure 12. Sketch map of 12CL646.

Figure 13. Sketch map of 12CL647.

Figure 14. Sketch map of 12CL648.

The artifact assemblage includes material that was produced over a wide temporal range. The hand-painted whiteware fragment and the stoneware pipe bowl (Figure 15) span the early to late nineteenth century, while the Albany stoneware was produced from the early nineteenth through early twentieth centuries (Ketchum 1983; Mansberger 1998; Price 1981).

According to the 1876 Clark County atlas, 12CL648 is located at the intersection of current State Route 3/62 and a former road to Utica on the Ohio River (Figure 4). The north end of the Utica road has been incorporated into the INAAP road system, and a short stretch is intact at the southern end at Utica. Construction of the INAAP has destroyed most the road between the two ends. The 1876 atlas indicates a cemetery on the east side of the intersection of current State Route 3/62 and the old Utica road, at the approximate location of 12CL648 (Figure 4). On the 1937 15' topographic map, a structure is depicted at the location of 12CL648, but no cemetery is indicated in the area (Figure 5). A reconnaissance survey conducted during preparation of the *Indiana Army Ammunition Plant Cultural Resources Management Plan* (Peter et al. 1995) identifies the location of 12CL648 as the "Josephine Cox and H. P. Lumen House" and indicates that, according to oral tradition, a "white weatherboard house" of unknown date was located here.

It is recommended that Phase II investigations be conducted at 12CL648 for the following reasons. First, the 1876 Clark County atlas indicates a cemetery at this approximate location. It is possible that a small family cemetery was located here but was subsequently removed, perhaps to Adams Cemetery to the north, which is not depicted on the 1876 atlas. If a cemetery was formerly located in the site vicinity prior to construction of the farmstead, there is a potential that some burials were not removed. Phase II testing of the area should attempt to determine if any historic burials are located within the site vicinity. Secondly, the artifact assemblage from the site suggests a possible middle to early nineteenth-century occupation located at an important intersection, possibly dating to the initial settlement of the area. State Route 3/62 follows the old Charlestown-Jefferson-

Figure 15. Stoneware pipe from 12CL648.

ville Pike which was established in 1810, and Utica was established in 1816 as a ferry crossing on the Ohio River (Indiana Historic Sites and Structures Inventory 1988). Site 12CL648 is therefore strategically located at the intersection of two major roads dating to the early nineteenth century that witnessed heavy traffic during Euroamerican settlement of the region. Third, the presence of a cistern and smaller brick surface features suggests that intact subsurface deposits exist at the site. Based on this evidence, it is suggested that 12CL648 is potentially eligible for listing in the NRHP, and Phase II investigations are recommended.

12CL649

Site 12CL649 (field number AOS 10) consists of ten positive posthole tests on an upland ridge (Figures 2 and 16). It is located approximately 30 m west of 2nd Avenue and 200 m east of an artificial pond near the center of the survey tract. The site, which measures approximately 30-x-120 m, was located in a pasture with no surface visibility. Ten lithic artifacts were found at the site consisting of four pieces of chert block shatter, four broken chert flakes, and two tertiary chert flakes. Fifty percent (n=5) of the artifacts were found between 0 and 10 cm below surface, four are from 0 to 20 cm below surface, and one is from 0 to 30 cm below surface. Subsurface tests indicate an abrupt plow zone to B horizon transition at 30 to 35 cm below surface, indicating

Figure 16. Sketch map of 12CL649.

that agricultural activity and erosion have severely impacted the depositional integrity of the site.

Based on the paucity of material, lack of cultural or temporally diagnostic artifacts, and evidence of severe erosion, 12CL649 is considered ineligible for listing in the NRHP and no additional work is recommended.

12CL650

Site 12CL650 (field number AOS 11), which measures approximately 20-x-20 m, consists of ten positive posthole tests that produced 15 prehistoric and historic artifacts (Figures 2 and 17). It is located approximately 100 m west of 2nd Avenue, 100 m north of an abandoned section of Salem Road, and 60 m east of an artificial pond near the center of the survey tract on an upland ridge. The site was located in a pasture with no surface visibility. The southwest edge of the site is bordered by an eroded/disturbed area measuring approximately 30-x-50 m. This area appears as a depression near the head of a swale and may be the result of erosion and/or borrow activity. Both historic and prehistoric artifacts were recovered from 12CL650. The prehistoric artifacts were recovered from depths of 10 to 30 cm below surface and consist of one broken chert flake, one primary chert flake, and one piece of chert block shatter. Historic artifacts consist of 12 brick fragments (5 glazed) found between 0 and 30 cm below surface.

No structure is depicted at this location on the 1876 Clark County atlas, while the 1937 15' topographic does indicate a structure here, suggesting that the site dates to the late nineteenth century at the earliest through the early twentieth century (Figures 4 and 5). Historic artifacts recovered from the site consist entirely of brick fragments and do not permit a more refined temporal assignment. According to oral tradition, this was the location of the Maurice and Lucielle Prather House, a brick structure of unknown date (Peter et al. 1995).

Construction and subsequent demolition of the historic structure has severely impacted the depositional context of the prehistoric component of 12CL650. The paucity and limited range of historic artifacts, as well as lack of evidence of surface features in the area, suggests that the historic component has also been severely disturbed by demolition activity during construction of the INAAP. Based on these findings, 12CL650 is considered ineligible for listing in the NRHP and no additional work is recommended.

12CL651

Site 12CL651 (field number AOS 12) consists of prehistoric lithic material derived from four posthole tests on a subtle upland ridge approximately 250 m northwest of an abandoned section of Salem Road and 390 m east of Patrol Road and State Route 3/62 (Figures 2 and 18). It measures approximately 25-x-60 m and is located in a pasture with 10 percent surface visibility. Four artifacts were found at the site consisting of one broken chert flake, one secondary chert flake, one piece of chert block shatter, and one end scraper fragment. Artifacts were found between 10 and 20 cm below surface. An abrupt plow zone to B horizon transition at 25 cm below surface indicates that agricultural activity has caused severe erosion at the site location.

Based on the paucity of artifacts and disturbance due to agricultural activity and subsequent erosion, 12CL651 in not considered eligible for listing in the NRHP. No additional investigations are recommended.

12CL652

Site 12CL652 (field number AOS 13) is a single broken chert flake located on the west slope of a subtle upland ridge approximately 85 m northwest of 3rd Street and 120 m west of the intersection of 3rd and 4th streets (Figures 2 and 19). The artifact was found between 10 and 20 cm below surface. The soil profile at this location indicates an abrupt plow zone to B horizon transition at 25 cm below surface, indicating that erosion has been severe at this location. In addition, the area between the site and 3rd Street has been disturbed by agricultural activity, shoulder grading/ditch excavation, and establishment of a walnut plantation.

Figure 17. Sketch map of 12CL650.

Figure 18. Sketch map of 12CL651.

Figure 19. Sketch map of 12CL652.

Due to disturbance from agricultural activity, erosion, establishment of a walnut grove, and road and drainage ditch construction work, the depositional integrity of this location has been severely compromised. Based on this and the paucity of cultural material, 12CL652 is considered ineligible for listing in the NRHP and no additional work is recommended.

CONCLUSIONS AND RECOMMENDATIONS

The Phase Ia archaeological reconnaissance of a 368-ha (920-acre) parcel located within the INAAP in Clark County, Indiana, resulted in the identification of 13 archaeological sites. Sites 12CL644, 12CL646, 12CL647, 12CL649, 12CL651, and 12CL652 are pre-Columbian Native American sites consisting of scatters of lithic chipping debris and tool fragments. Sites 12CL640, 12CL641, 12CL642, 12CL643,and 12CL648 are Euroamerican historic sites, and 12CL645 and 12CL650 have historic and prehistoric components. Based on a paucity of archaeological materials, various types of postdepositional disturbances, and significant degree of erosion, indicating that no significant cultural deposits are present, prehistoric sites 12CL644, 12CL646, 12CL647, 12CL649, 12CL651, and 12CL652 are recommended as ineligible for listing in the National Register of Historic Places. Historic sites 12CL640, 12CL641, 12CL642, and12CL643, as well as the multicomponent sites 12CL645 and 12CL650 are considered ineligible for listing in the National Register of Historic Places due to their late nineteenth- through middle twentieth-century temporal affiliations and demolition by modern mechanical razing during construction of the INAAP. One historic site, 12CL648, is considered potentially eligible for listing in the National Register of Historic Places, and Phase II investigations are recommended. No further work is recommended for the remaining 12 sites.

Phase II investigations are recommended for historic site 12CL648. Data derived from archival sources indicate that this site is located at the intersection of two principal roadways established in the early nineteenth century, and artifacts recovered from screened posthole tests are consistent with such a temporal assignment. In addition, the 1876 atlas indicates an unnamed cemetery in the general site vicinity. Based on this evidence it is suggested that additional investigations be conducted at this site to determine eligibility for listing in the National Register of Historic Places.

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