Archaeological Records Check:
US 31 Plymouth to South Bend Project in Marshall and St. Joseph Counties, Indiana.

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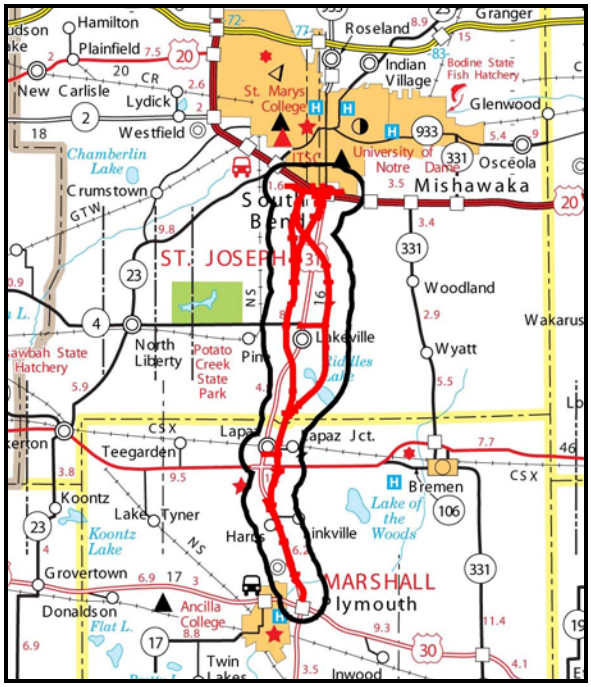

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INTRODUCTION

In response to a request from Bernardin - Lochmueller & Associates, Inc., an archaeological records check has been conducted for the US 31 Plymouth to South Bend project in Marshall and St. Joseph Counties, Indiana. The Study Area for this project is located in the extreme north-central part of Indiana between the town of Plymouth and the city of South Bend. There are four alternatives under consideration for the project; Alternatives Cs, Es, G-Cs, and G-Es (Figures 1 - 4). These alternatives are located on portions of the USGS 7.5 minute series Lakeville, La Paz, Plymouth, South Bend East, South Bend West, and Wyatt, Indiana topographic quadrangles.

The working alignment of Alternative Cs is approximately 19.5 miles (31.4 km) long and involves roughly 962 acres (389.32 hectares) of land (Figure 1). It traverses, from south to north, portions of Sections 34, 35, 27, 22, 15, 16, 9, and 4, Township 34 North, Range 2 East; Sections 33, 34, 28, 27, 22, and 15, Township 37 North, Range 2 East; "Michigan Road Grant" Sections 1 and 2; Sections 34, 27, 22, 15, 10, and 3, Township 36 North, Range 2 East; and Sections 34, 35, 36, 27, 26, and 25, Township 37 North, Range 2 East.

The working alignment of Alternative Es is approximately 20 miles (32.2 km) long and involves about 969 acres (392.15 hectares) of land (Figure 2). It crosses, from south to north, portions of Sections 34, 35, 27, 22, 15, 16, 9, and 4, Township 34 North, Range 2 East; Sections 33, 34, 28, 27, 22, and 15, Township 35 North, Range 2 East; "Michigan Road Grant" Sections 1 and 2; Sections 34, 27, 22, 15, 14, 10, 11, and 2, Township 36 North, Range 2 East; Sections 35, 36, 25, and 26, Township 37 North, Range 2 East; and Section 30, Township 37 North, Range 3 East.

The working alignment of Alternative G-Cs is approximately 20.5 miles (33 km) long and involves roughly 1012.5 acres (409.76 hectares) of land (Figure 3). It traverses, from south to north, portions of Sections 34, 35, 27, 22, 15, 16, 9, and 4, Township 34 North, Range 2 East; Sections 33, 34, 28, 27, 22, 15, 14, 11, 12, and 1, Township 35 North, Range 2 East; Sections 36, 35, 26, 25, 24, 13, 12, 11, 2, and 3, Township 36 North, Range 2 East; and Sections 34, 35, 36, 27, 26, and 25, Township 37 North, Range 2 East.

The working alignment of Alternative G-Es is roughly 20.5 miles (33 kilometers) long and involves a total of approximately 1011 acres (409.15 hectares) of land (Figure 4). It crosses, from south to north, portions of Sections 34, 35, 27, 22, 15, 16, 9, and 4, Township 34 North, Range 2 East; Sections 33, 34,28,27,22, 15, 14, 11, 12, and 1, Township 35 North, Range 2 East; Sections 36, 35, 26, 25, 24, 13, 12, 11, and 2, Township 36 North, Range 2 East; Sections 35, 36, 25, and 26, Township 37 North, Range 2 East; and Section 30, Township 37 North, Range 3 East.

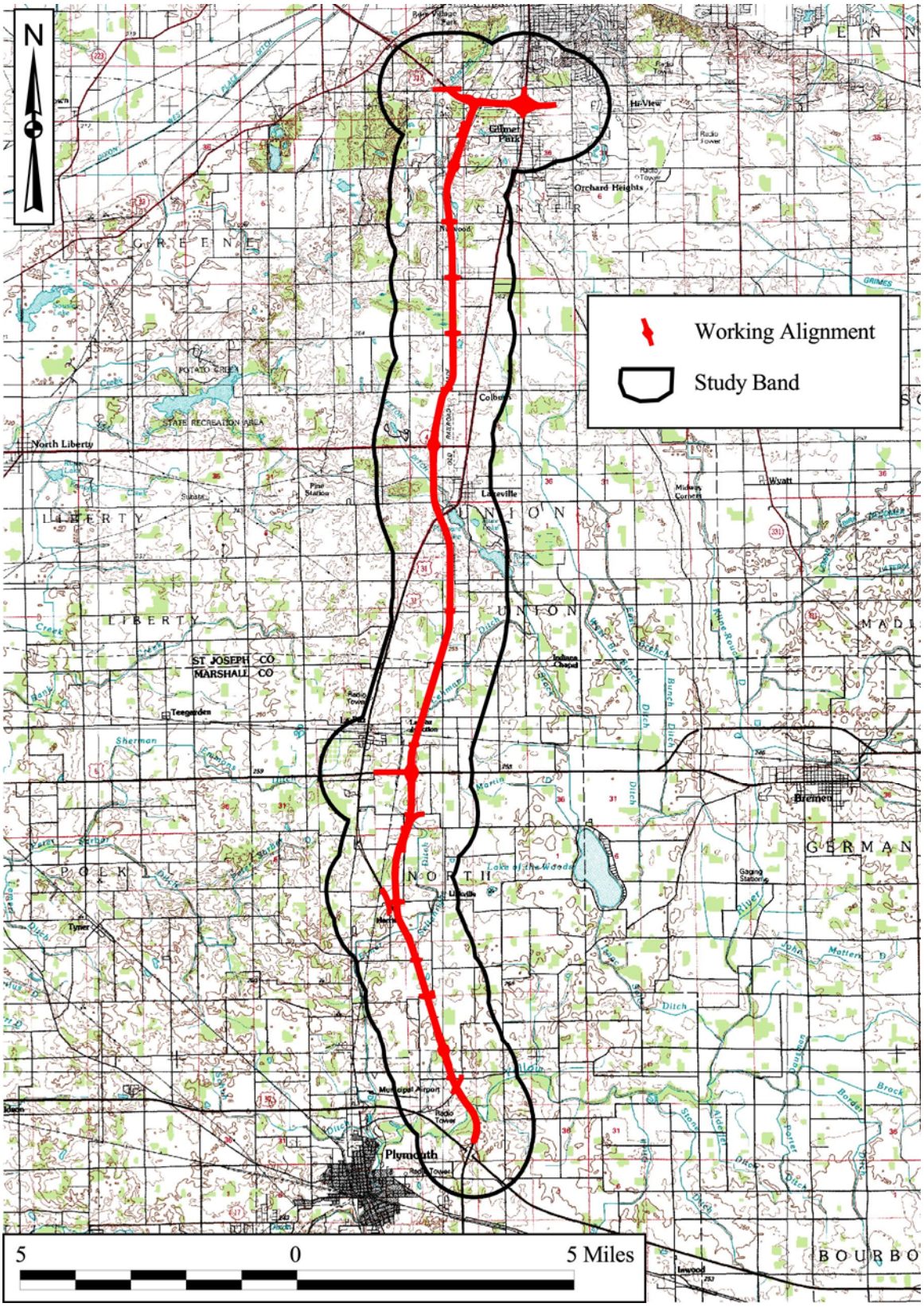
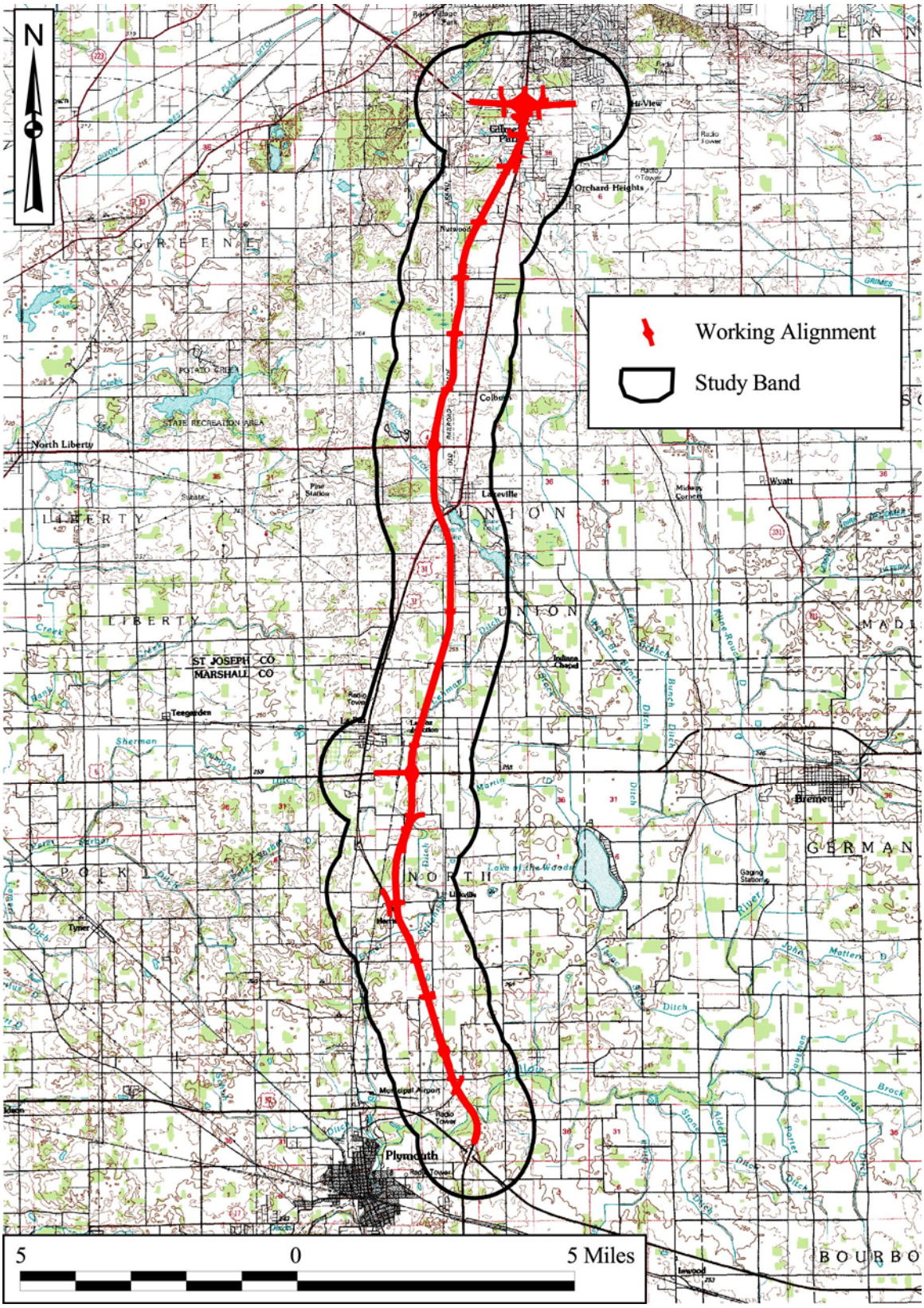


Figure 1. Map showing the general location of Alternative Cs.



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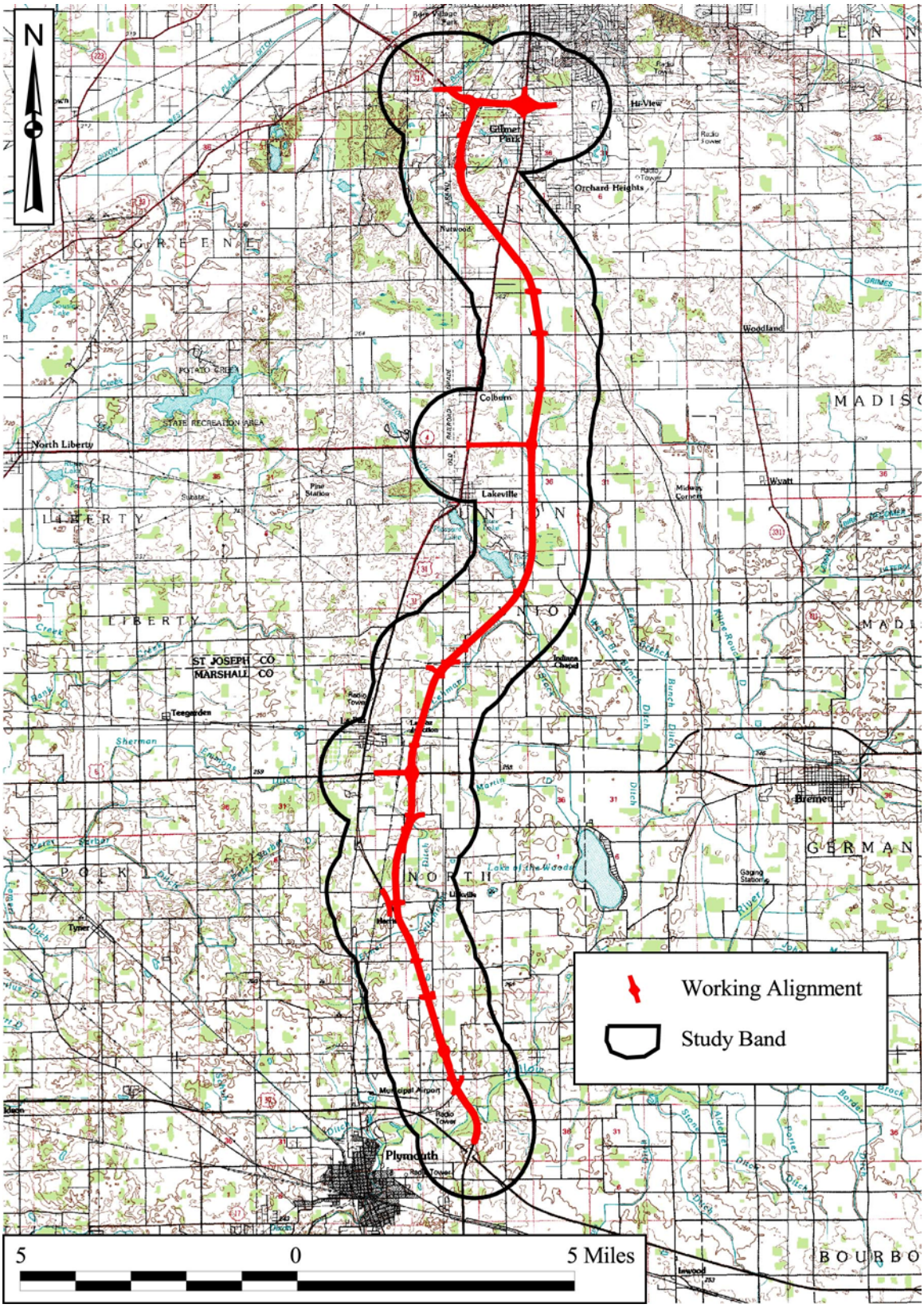

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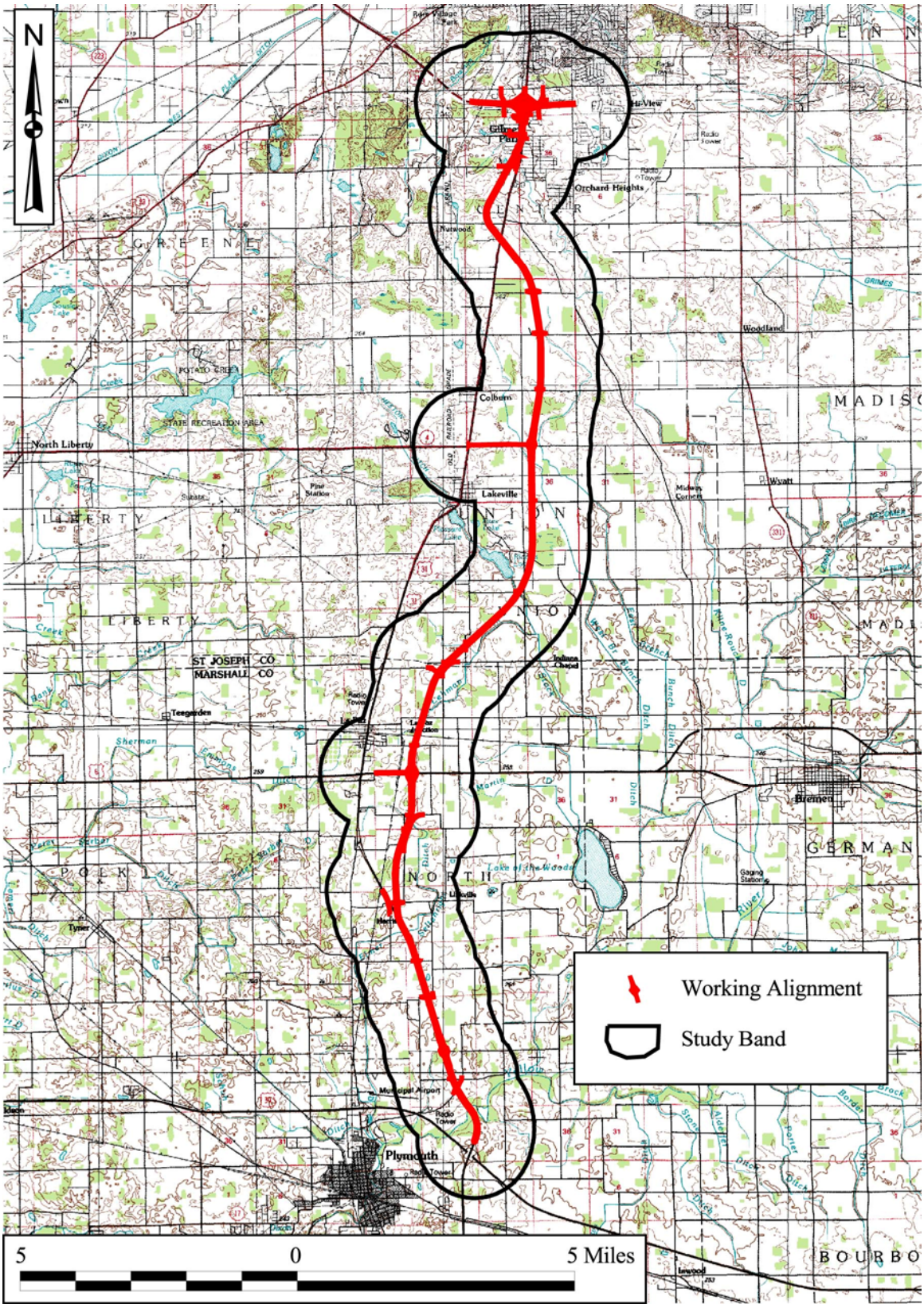

Figure 4. Map showing the general location of Alternative G-Es

ENVIRONMENTAL SETTING

Physiography

The Study Area is located within the Northern Moraine and Lake physiographic region, which has been divided into further physiographic regions due its variety of glacial and associated postglacial landforms (Schneider 1966). The majority of the project area lies within the Steuben Morainal Lake Area with a small area near the city of South Bend being within the Kankakee Outwash and Lacustrine Plain (Schneider 1966).

Schneider (1966) describes the Steuben Morainal Lake Area as a region of complex topographic expression and physiographic history, often with relatively rugged relief. There are a great variety of existing landforms that are all of glacial or postglacial origin and were produced by the advance and related activity of the Huron-Saginaw and Ontario-Erie Lobes of the Wisconsin ice sheet about 15,000 years ago. Knob-and-kettle type end moraine topography is the most evident, with many of the knobs being kame complexes. The kettle depressions are the origin of the thousands of lakes and peat bogs characteristic of northern Indiana. The area also contains abundant meltwater channels, as well as small lacustrine plains and occasional sand dunes (Schneider 1966:52-53).

The Kankakee Outwash and Lacustrine Plain is described as a vast area much of which is low, poorly drained, and underlain mostly by sand (Schneider 1966). The majority of the sand was deposited as outwash by glacial meltwaters derived from melting ice at several times during the late Wisconsin time. Some of the outwash appears to have been deposited in standing water, suggesting a lacustrine origin, while most of the outwash material was deposited in the form of broad valley trains and outwash plains that are related to the present day St. Joseph, Kankakee, Tippecanoe, and Iroquois Rivers. A large part of the original topography of this region has been greatly modified by the wind blowing, reworking, and redistributing the sand. This resulted in a veneer of eolian deposits over the outwash material that formed virtually featureless sand plains or in other places the piling of sand dunes in all shapes and sizes (Schneider 1966: 52).

Homoya et al. (1985) show the Study Area to be located within the Northern Lakes Natural Region, which is identified by the presence of numerous freshwater lakes of glacial origin. This region was invaded from the northwest by the Lake Michigan Lobe of the late Wisconsin ice sheet, from the northeast by the Saginaw Lobe, and from the east by the Erie Lobe. As a result, the area is now covered with a thick and complex deposit of glacial material, which exceeds 450 feet in places. The glacial topography is complex and characterized by knobs, kettles, kames, valley trains, and outwash plains. The natural community types are numerous and include bog, fen, marsh, prairie, sedge meadow, swamp, seep spring, lake, and various deciduous forest types. Bogs are more numerous here than in other natural region within the state. In addition, swamp communities commonly border lake and bog sites, while areas of marsh are commonly associated with lake communities. The forest types consisted of oak-hickory and beech-maple (Homoya et al. 1985:252-253). Casebere (1997) states that the juxtaposition and

blending of these numerous and variable natural communities created a great diversity of plant and animal life in this region.

Geology

North-central Indiana is underlain by Upper Devonian to Lower Mississippian-aged rocks and is a part of the Michigan Basin. The bedrock in this area consists of a nearly continuous sequence of brown, black, and green shales, which belong to the Antrim, Ellsworth, and Sunbury Formations. These rocks become thicker northward as they slope down dip into the Michigan Basin and thin out to the south and southwest along the flank of the Kankakee Arch (Howe 1997; Camp and Richardson 1999). There are no natural exposures of these rocks in northern Indiana due to the thick covering of glacially derived material.

The unconsolidated surface deposits found within the Study Area are Quaternary in age and were formed during the Pleistocene epoch. The project lies within that portion of Indiana that was extensively worked by successive episodes of Wisconsin glaciation. As discussed above, this area was affected by the advance and retreat of the Huron-Saginaw and Ontario-Erie Lobes of the Wisconsin ice sheet. Therefore, these deposits were derived from eolian, or windblown, loess and sand, glacial outwash, and recent alluvial river channel and floodplain deposits. Both Marshall and St. Joseph Counties produce gravel and sand for aggregate purposes from the glacial drift deposits (Wayne 1966; Melhorn 1997; Camp and Richardson 1999).

Deutchman and Dorwin (1979) note that the glacial outwash deposits would have provided the prehistoric inhabitants of the area plentiful chert cobbles for the use in stone tool manufacturing. Cantin (1994) shows that there are no known chert outcrops, or even chert-bearing formations, near the Study Area and states that gravel cherts are often overlooked in their role as local prehistoric lithic resources.

The numerous bogs and lakes created in northern Indiana during the Late Pleistocene have produced peat and marl deposits of commercial quality (Wier and Patton 1966; Camp and Richardson 1999). Marl and peat are common organic sediments found in glacial lakes and swamps. These sediments began to accumulate as the last of the glacial ice melted in this region.

Marls are soft calcareous muds that commonly contain fossil remains. This material was used as flux in smelting iron from bog ore in Mishawaka in the 1830's and was also used to make cement. In 1877 South Bend was the site of the first successful manufacturer in the country of portland cement from a mixture of marl and clay. Marls are used today as agricultural lime to reduce the acidity of soils (Wier and Patton 1966; Camp and Richardson 1999).

Peat is partly decayed plant material that when buried eventually turns into coal. The major use of peat is to improve and lighten soils that are heavy with clay. It is also used as a conditioning agent and filler in some fertilizers, a component of potting soil,

and as an absorbing material for environmental contaminants (Wier and Patton 1966; Camp and Richardson 1999).

Soils

Due to the fact that the Marshall and St. Joseph County soil surveys utilize somewhat different nomenclature and groupings with regards to the soil associations and soil types, each county's soils will be discussed individually. With respect to Marshall County, there are four soil associations mapped by the United States Department of Agriculture (USDA) within the Study Area. These include the Oshtemo-Owosso-Fox association, the Crosier-Brookston association, the Riddles-Metea-Wawasee association, and the Houghton-Adrian-Palms association.

Oshtemo-Owosso-Fox Association soils are deep and moderately deep, nearly level to strongly sloping, well drained, moderately coarse textured and coarse textured soils that are over sand and gravel and formed in outwash deposits. These soils are found on outwash plains and moraines (Smallwood 1980).

Crosier-Brookston Association soils are deep, nearly level, somewhat poorly drained and very poorly drained, medium textured soils that formed in glacial till. These soils are found on till plains and moraines (Smallwood 1980).

Riddles-Metea-Wawasee Association soils are deep, nearly level to strongly sloping, well drained, moderately coarse textured and coarse textured soils that formed in glacial till. These soils are found on moraines (Smallwood 1980).

Houghton-Adrian-Palms Association soils are deep, nearly level, very poorly drained soils that formed in organic material. These soils are found in bogs and on old lakebeds on till plains, outwash plains and moraines (Smallwood 1980).

There are four soil associations mapped by the USDA within the Study Area in St. Joseph County. These are the Crosier-Brookston-Milford association, the Hillsdale-Oshtemo association, the Houghton-Adrian-Palms association, and the Riddles-Miami-Crosier association.

Crosier-Brookston-Milford Association soils are deep, depressional and nearly level to gently sloping, and somewhat poorly drained to very poorly drained. These soils are found on till plains and lake plains (Benton 1977).

Hillsdale-Oshtemo-Chelsea Association soils are deep, nearly level to strongly sloping, and well-drained to excessively drained. These soils are found on till plains, moraines, outwash plains, and terraces (Benton 1977).

Houghton-Adrian-Palms Association soils are deep, depressional and nearly level, and very poorly drained. These organic soils are found on lake plains, outwash plains, and till plains (Benton 1977).

Riddles-Miami-Crosier Association soils are deep, nearly level to strongly sloping, and well-drained to somewhat poorly drained. These soils are found on till plains (Benton 1977).

The following tables list each soil type, by county, that is encountered within the working alignments of the alternatives. Included in these tables are the drainage classification for each soil type, as well as their occurrence on landforms, and parent material.

Table 1. USDA soil types mapped within the Working Alignments in Marshall County.

Symbol	**Soil Type**	**Drainage**	**Landform**	**Parent Material**
Ad	Adrian muck, drained	Very poor	Till plains and moraines	Organic material over sandy material
AuA	Aubbeenaubbee sandy loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
Bd	Brady sandy loam	Somewhat poor	Outwash plains	Outwash deposits
BoA	Bronson loamy sand, 0-2% slopes	Moderately well	Outwash plains	Outwash deposits
Br	Brookston loam	Very poor	Till plains and moraines	Glacial till
CtA	Crosier loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
Fc	Fluvaquents, loamy	Somewhat poor	Bottomlands	Alluvium
FsA	Fox sandy loam, 0-2% slopes	Well	Uplands	Outwash deposits
Gf	Gilford sandy loam	Very poor	Outwash plains	Sandy lacustrine and eolian deposits
Ho	Houghton muck, drained	Very poor	Till plains and moraines	Organic material
MeB	Martinsville loam, 2-6% slopes	Well	Terraces and outwash plains	Outwash deposits
MgB	Metea loamy fine sand, 2-6% slopes	Well	Moraines	Glacial till
Mn	Milford silty clay loam	Very poor	Broad flats, swales, and narrow drainageways in glacial lakebeds	Lacustrine deposits
OsA	Oshtemo loamy sand, 0-2% slopes	Well	Moraines and outwash plains	Outwash deposits
OsB	Oshtemo loamy sand, 2-6% slopes	Well	Moraines and outwash plains	Outwash deposits

Symbol	Soil Type	Drainage	Landform	Parent Material
OsC	Oshtemo loamy sand, 6-12% slopes	Well	Moraines and outwash plains	Outwash deposits
OwA	Owosso sandy loam, 0-2% slopes	Well	Uplands	Glacial till
Pa	Palms muck, drained	Very poor	Till plains and moraines	Organic material
PdA	Pinhook sandy loam, 0-2% slopes	Poor	Outwash plains	Outwash deposits
Re	Rensselaer loam	Very poor	Uplands	Outwash deposits
RsA	Riddles sandy loam, 0-2% slopes	Well	Moraines	Glacial till
RsB	Riddles sandy loam, 2-6% slopes	Well	Moraines	Glacial till
RsC2	Riddles sandy loam, 6-12% slopes, eroded	Well	Moraines	Glacial till
RsD	Riddles sandy loam, 12-18% slopes	Well	Moraines	Glacial till
TyB	Tyner loamy sand, 2-6% slopes	Well	Uplands	Sandy lacustrine and eolian deposits
Ua	Udorthents, loamy	N/A	Outwash plains and moraines	N/A
Wh	Washtenaw silt loam	Very poor	Moraines, till plains and outwash plains	Alluvium
WkC2	Wawasee sandy loam, 6-12% slopes, eroded	Well	Knolls and ridges on broad uplands	Glacial till
Wt	Whitaker loam	Somewhat poor	Terraces and outwash plains	Outwash deposits

Table 2. USDA soil types mapped within the Working Alignments in St. Joseph County.

Symbol	Soil Type	Drainage	Landform	Parent Material
Ad	Adrian muck, drained	Very poor	Till plains and moraines	Organic material over sandy material
Am	Alluvial land	Somewhat poor	Bottomlands	Alluvium
Au	Aubbeenaubbee sandy loam	Somewhat poor	Uplands	Glacial till
Bd	Brady sandy loam	Somewhat poor	Terraces and outwash plains	Outwash deposits
BeA	Brems fine sand, 0-2% slope	Moderately well	Outwash plains	Eolian sand deposits

Symbol	Soil Type	Drainage	Landform	Parent Material
Br	Brookston silty clay loam	Very poor	Till plains	Glacial till
ChA	Chelsea fine sand, 0-5% slopes	Excessive	Outwash plains	Eolian sand deposits
ChC	Chelsea fine sand, 5-10% slopes	Excessive	Outwash plains	Eolian sand deposits
CtA	Crosier loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
De	Del Rey silt loam	Somewhat poor	Lacustrine plains	Lacustrine deposits
GP	Gravel Pits	N/A	Disturbed	N/A
HdA	Hillsdale sandy loam, 0-2% slopes	Well	Till plains and moraines	Glacial till
HeC2	Hillsdale complex, 6-12% slopes, eroded	Well	Till plains and moraines	Glacial till
HeD2	Hillsdale complex, 12-18% slopes,	Well	Till plains and moraines	Glacial till
Hm	Houghton muck	Very poor	Till plains and moraines	Organic material
Ho	Houghton muck, drained	Very poor	Till plains and moraines	Organic material
La	Landes loam	Moderately well	Bottomlands	Alluvium
Mc	Marsh	Very poor	Moraines and outwash plains	Organic material
MeA	Martinsville loam, 0-2% slopes	Well	Terraces and outwash plains	Outwash deposits
MeB2	Martinsville loam, 2-6% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
MeC2	Martinsville loam, 6-12% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
MkB	Metea loamy fine sand, 4-10% slopes	Well	Till plains	Glacial till
MoC3	Miami clay loam, 6-12% slopes, severely eroded	Well	Till plains	Glacial till
MoD3	Miami clay loam, 12-18% slopes, severely eroded	Well	Till plains	Glacial till
Mp	Milford silty clay loam	Poor	Glacial lake plains	Lacustrine deposits

Symbol	Soil Type	Drainage	Landform	Parent Material
OsA	Oshtemo sandy loam, 0-2% slopes	Well	Terraces and outwash plains	Outwash deposits
OsB	Oshtemo sandy loam, 2-6% slopes	Well	Terraces and outwash plains	Outwash deposits
OsC2	Oshtemo sandy loam, 6-12% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
OsD	Oshtemo sandy loam, 12-18% slopes	Well	Terraces and outwash plains	Outwash deposits
Pa	Palms muck, drained	Very poor	Till plains	Organic material
Re	Rensselaer loam	Very poor	Outwash plains	Outwash deposits
Rm	Rensselaer mucky loam	Very poor	Outwash plains	Outwash deposits
RtA	Riddles loam, 0-2 % slopes	Well	Till plains	Glacial till
RtB	Riddles loam, 2-6 % slopes	Well	Till plains	Glacial till
RtC2	Riddles loam, 6-12 % slopes, eroded	Well	Till plains	Glacial till
RtD2	Riddles loam, 12-18 % slopes, eroded	Well	Till plains	Glacial till
Tx	Troxel silt loam	Well	Outwash plains	Outwash deposits
TyD	Tyner loamy sand, 12-18% slopes	Well	Terraces and outwash plains	Sandy outwash deposits
Wk	Wallkill silt loam	Very poor	Till plains and lake plains	Organic material
Ws	Washtenaw silt loam	Very poor	Moraines, till plains and outwash plains	Alluvium
Wt	Whitaker loam	Somewhat poor	Outwash plains	Outwash deposits

Climate

The north-central portion of Indiana has a variable climate that is classified as cool-temperate-continental and humid (Newman 1997), and is modified locally by Lake Michigan (Benton 1977; Smallwood 1980). In Marshall County the summers are often hot, while the winters are relatively cold. St. Joseph County has less temperature extremes than Marshall County due to increased cloud cover resulting from the county's closer proximity to Lake Michigan (Benton 1977; Smallwood 1980). This area of the state has an average annual temperature of 49 degrees F. In addition, this area is not as prone to summer droughts as is the remainder of Indiana due to increased ground

moisture resulting from winter snow cover. The average annual growing season for these counties is the shortest in the entire state of Indiana and ranges from 150 to 170 days per year (Newman 1997). Average annual snowfall is 30 to 40 inches or more per year, which again is greatly affected by Lake Michigan (Newman 1997). Average yearly precipitation is approximately 37 inches for Marshall County and approximately 36 inches for St. Joseph County (Benton 1977; Smallwood 1980).

Although there have been minor fluctuations, with periods of warming and cooling (Newman 1997), the current climatic conditions in Indiana have existed for approximately the past 5,000 years (Stafford 1997; Melhorn 1997; Newman 1997). However, during the Pleistocene Epoch, the climate was much colder, with glaciers covering large portions of the state. In northern Indiana, the glacial ice lingered longer than in the rest of the state (Melhorn 1997), with the spruce dominated forests characteristic of the glacial regime being gradually replaced by the deciduous forests (Stafford 1997) that are described below.

Flora and Fauna

The presettlement vegetation of north-central Indiana consisted primarily of an oak-hickory association mixed with large areas of both a beech-maple association and a wetlands association (Lindsey 1997). As noted previously, the diverse blending of natural community types within this region resulted in a great diversity of plant and animal life (Casebere 1997). Dry and dry-mesic upland forest types, which once covered approximately half of the region, dominate the oak-hickory association. This natural community is characterized by such species as red oak, white oak, black oak, shagbark hickory, and pignut hickory. The mesic areas of the beech-maple association are characterized by such dominant species as beech, sugar maple, black maple, and tulip tree. Natural community types of lake, swamp, marsh, and bog, each of which has many distinctive species, a few of which are state restricted, characterize the wetlands association. These restricted species include ginger-leaved pyrola, needle-and-thread grass, knotted spikerush, autumn willow, and Deam's rockcress (Homoya et al.1985:252-253; Casebere 1997; Lindsey 1997).

According to Mumford (1966, 1997), there are currently 57 species of wild mammals occurring in Indiana. The more commonly observed species include white-tailed deer, opossum, gray squirrel, red squirrel, fox squirrel, eastern chipmunk, eastern cottontail rabbit, raccoon, woodchuck, and striped skunk. Other, not as readily seen, species include several varieties of bat, shrew, and vole, as well as beaver, mink, and coyote (Mumford 1966). As with the flora, north-central Indiana's Northern Lakes Natural Region is home to distinctive fauna including the spotted turtle, massasaugua rattlesnake, Blanding's turtle, star-nosed mole, cisco, marsh wren, swamp sparrow, and sandhill crane (Homoya et al.1985:252-253; Casebere 1997). Many aquatic species of mammals, turtles, and fish are prevalent in this region and waterfowl, such as ducks and geese, are also extremely abundant especially during migrations (Casebere 1997). Bison and black bear were also present in north-central Indiana, but were gone by the mid 1800s (Richards and Whitaker 1997).

Many species of megafauna existed in the region during the Pleistocene. These included the mastodon, mammoth, giant beaver, giant ground sloth, saber-tooth tiger, dire wolf, musk ox, various species of peccary, the ancient bison, short-faced bear, stag moose, tapir, giant armadillo, jaguar, and horse. However, all of these species were extinct in Indiana by approximately 10,000 years ago (Richards and Whitaker 1997).

CULTURAL OVERVIEW

Paleo-Indian (prior to 8000 B.C.)

The evidence for Paleo-Indian peoples in eastern North America includes several types of lanceolate fluted and unfluted points as well as a diverse assemblage of chipped stone tools (Griffin 1967:176; Justice 1987). During late glacial and early post-glacial times these tools were used to exploit large game such as caribou, musk oxen, mammoth, and mastodon as well as scarce edible plants. Small sites with no evidence for permanent structures and low artifact densities imply high mobility and band-level social organization (Stoltman and Baerreis 1983:253-254).

Fluted Paleo-Indian points are among the rarest point forms and seldom occur in good archaeological context. Approximately 400 fluted points are recorded for Indiana as a whole, the majority occurring in the southern half of the state from floodplain or terrace contexts. Tankersley (1992:9) notes that six of these points have been reported for Marshall County, while only one has been reported for St. Joseph County.

Early Archaic (8000 - 6000 B.C.)

The hunting and foraging people of later Paleo-Indian and Early Archaic times slowly adjusted to the extinction of large game brought on by the changing landscapes of an increasingly warmer and drier climate. The distinction implied by the term Early Archaic is thus a blurred one, marking a time of transition from specialized hunting and limited foraging toward more regionally focused deer and small game hunting (Stoltman 1978:714; Hicks 1992:13). Tool assemblages indicate continued primary emphasis on hunting and animal processing (Griffin 1983:244), though the gathering of newly available plants and aquatic resources undoubtedly increased during this time. An increase in the number of sites encountered suggests population growth or aggregation as well as an increasingly diversified subsistence/settlement system (Mohow 1992:21).

Middle Archaic (6000 - 4000 B.C.)

Middle Archaic people of the Midwest adapted to a time of maximum warmth and dryness that was accompanied by the spread of grasslands and oak-hickory forests. A reduction in hunting and gathering mobility brought on by resulting resource patchiness probably fostered population growth and logistically organized collector strategies (Brown and Vierra 1983:168; Stafford 1994:219-221). An increase in rough and ground stone tools, such as grinding stones, pestles, bannerstones, and grooved axes, marks a

time of increased subsistence diversity (Griffin 1967:178), but deer, hickory nuts, and at some locations aquatic resources probably dominated the diet (Stafford 1994:223). Middle Archaic horizons from the Koster site in the lower Illinois Valley contain chipped, rough and ground stone tools, diverse antler and bone tools, hearths, roasting pits, mussel steaming pits, shell dumps, shallow storage pits and evidence for rectangular structures (Brown and Vierra 1983:183-184). High quantities of fire-cracked or fire-burned rock at Middle Archaic base camps suggests intensive food processing, probably the extraction of hickory nutmeats and oil (Stafford 1994:221).

Late Archaic (4000 - 1000 B.C.)

The Late Archaic in the Midwest is widely known as a period of increasing complexity and diversity and as a time of transition between established Archaic patterns and new Woodland patterns featuring ceramics, food production, and mound building (Griffin 1983:249; Stoltman 1978:715). Larger sites with recurrent habitations suggest considerable population growth (Griffin 1983:249), which may be linked to the gradual return of cooler and wetter conditions and the spread of modern mixed-deciduous forests. Other general trends include increasing use of plant foods, increasing numbers of grinding stones, a greater variety of preserved faunal remains, evidence for structures, the appearance of shell midden sites, long distance exchange of raw materials and finished objects, and inclusion of exchange objects in burials (Griffin 1967:178-180; Griffin 1983:249; Kellar 1983:29). Early fiber-tempered ceramics appear in the southeast by about 2000 B.C. (Griffin 1967:180), but ceramics do not appear in the Midwest until the end of the Late Archaic (Griffin 1983:249). Evidence for the cultivation of native plants as well as squash and gourd imports from the southeast is evident at the end of the Late Archaic (Ford 1974:401).

There are a number of named regional Late Archaic manifestations throughout the Midwest. One of the best known is the Helton phase, which is known from the Koster site in the lower Illinois Valley. Helton phase artifacts include Matanzas, Godar, Helton, Karnak Stemmed and Table Rock Stemmed points, T-shaped drills, full and three-quarter grooved axes, plummets, bannerstones, metates, and chevron-incised bone pins. A variety of hearths and roasting pits are found at Helton phase sites along with evidence for a rectangular house pattern. Some differences in burial treatment suggest the marking of status and in some cases Helton phase burials contain exotic materials such as marine shell or copper (Griffin 1983:250; Brown and Vierra 1983:185; Munson and Cook 1980:734-736). By 2000 B.C. the Helton phase is replaced at Koster by the Titterington phase, which is defined by Wadlow, Etley, Sedalia, Merom, and Kampsville points (Brown and Vierra 1983:186). Titterington people are cited as having a well-adjusted economy that made equal use of floodplains, uplands, and areas between (Griffin 1983:250). Munson and Cook (1980) defined the French Lick phase (3000-1500 B.C.) in south-central and southwestern Indiana. This phase incorporates riverine shell midden and non-shell midden sites with Matanzas, Big Sandy II, Karnak, and straight to expanding stemmed points. The subsistence/settlement system is characterized by summer and fall base camps along large creeks and tributary confluences, fall and winter camps along tributaries, and summer shell midden sites along large rivers (Munson and

Cook 1980:723-730). Riverton culture sites (2000-1000 B.C.) have been identified along the middle Wabash River by Winters (1969). Sites range from shell middens along the river to terrace top settlements with houses and prepared clay floors (Winters 1969:137). Robeson Constricted Stem, Merom Expanding Stem, and Trimble Side Notched points are diagnostic of the Riverton Culture along with the occurrence of Robeson gouges, grooved sinkers, limonite axes, "cloudblower" pipes, and Indian Knoll rattles. Winters looks south for Riverton antecedents, arguing against connections to the earlier "Wabash Valley Archaic" (Winters 1969:103-108). Ford (1974:395) includes the various Late Archaic manifestations discussed here in a larger mid-continent tradition called the Riverine Archaic.

While the Riverine tradition clearly defines southern portions of Indiana, the Late Archaic in the northern half of the state is not as well understood. A complex known as Glacial Kame is known from burials in gravel mounds with distinctive marine shell, gorgets, and native copper grave goods. Red ochre and "birdstones" were often included as well (Griffin 1983:253; Kellar 1983:34). In the western portion of the state a related mortuary complex known as Red Ocher is defined by red ocher-covered burials in low artificial mounds. Distinctive Fulton Turkey-tail points are associated with Red Ocher manifestations, often occurring in large caches (Kellar 1983:34). These burial complexes appear ancestral to the burial ceremonialism that became so widespread during Early and Middle Woodland times.

Early and Middle Woodland (1000 B.C. - A.D. 500)

Roughly simultaneous occurrence of ceramic manufacture, food cultivation, and artificial earth constructions characterizes the Early and Middle Woodland periods in the Midwest. Following developments in the Middle Atlantic area, cord-marked ceramics such as Marion or Schultz Thick spread rapidly. More complicated indigenous ceramics with rocker and dentate stamped decoration appeared during the Middle Woodland along with trade vessels from the southeast (Griffin 1967:184; Griffin 1983:254). Intensive hunting and gathering appears to have been supplemented by cultivation of squash and gourd and the indigenous cultigens sunflower, sumpweed, and goosefoot (Stoltman 1978:718; Ford 1974:401). Corn was adopted from the southwest much later, and became a regular (though not staple) part of Middle Woodland subsistence (Ford 1974:402).

Early Woodland peoples constructed earthen mounds for the dead throughout many parts of eastern North America. The most extensive form of this practice by Adena peoples took place in the Ohio Valley area (Griffin 1983:254). Cremation and inhumation burials have been found in village cemeteries and in accretional mounds built over the locations of circular "ritual" structures (Griffin 1983:258; Clay 1986:581). The distribution of Adena mortuary goods among adult males suggests the presence of graded, achieved statuses (Mainfort 1989:173). Mortuary goods include cut mica, copper bracelets, copper beads, copper adzes, tubular pipes, effigy pipes, marine shell, engraved stone tablets, and plain and decorated ceramics (Griffin 1983:258-259). Small domestic sites, with strategic locations between valleys and uplands, characterize other Early Woodland complexes such as Black Sand in western Illinois (Griffin 1983:257).

After approximately 100 B.C. Middle Woodland Hopewellian regional complexes dominated the Midwest. Hopewell sites in Ohio include large and complex geometric earthworks and burial mound clusters (Griffin 1983:262-262). Mortuary goods reflect a wide sphere of interaction for Hopewell peoples. Copper, silver, galena, meteoric iron, quartz crystal, mica, obsidian, Ohio pipestone, and marine shell commonly appear in burials as raw materials or artifacts. Human and animal effigies in clay, on carved platform pipes or in cut mica are among the broad array of elaborate Hopewell artifact forms (Griffin 1967:184). Greber (1979) has identified some social divisions and "high ranking" individuals using mortuary data, but the structure of Hopewell society cannot be reliably inferred from the data (Griffin 1983:263). Havana Hopewell in western Illinois includes smaller mound burials and similar types of mortuary goods, though no geometric earthworks are present (Griffin 1983:268). A similar Hopewellian complex is known in western Michigan (Fitting 1978:47-49). Other mound building, stamped ceramic cultural complexes have been identified in the Great Lakes area, such as Laurel in Minnesota, northern Wisconsin, Michigan, southeastern Manitoba and western Ontario (Griffin 1983:271). Elsewhere, such as in northern Indiana, southeastern Michigan, and northern Ohio, poorly understood Middle Woodland complexes await further clarification (Fitting 1978:47). Schurr (2003a and b) has identified the Goodall Tradition in northwestern Indiana as being a manifestation of Middle Woodland Hopewell and a regional variant of Havana Hopewell from Illinois.

At a limited number of terrace and floodplain habitation sites throughout Indiana, Early Woodland Marion Thick ceramics occur in association with pits and thick midden deposits. In a similar setting, ceramics of Middle Woodland age are associated with living floors and hearths (Kellar 1983:36, 43; Hicks 1992:25). Aspects of Adena and Hopewell ceremonialism have been observed in southern and east-central Indiana. The Nowlin Mound site in southeastern Indiana contained seven log tombs within a single mound and small amounts of typical Adena mortuary goods (Kellar 1983:38). Crab Orchard Tradition Hopewell burial mounds are situated on high terraces and bluffs in southwestern Indiana, and a village/ceremonial complex has been identified in Posey County (Kellar 1983:45-46). Mounds and earth enclosures in east-central Indiana were constructed from late Adena through Hopewell times (Cochran 1992:26). Diagnostic artifact types for Adena sites in Indiana include Montgomery Incised ceramics, copper bracelets, and Adena points and cache blades. Hopewell diagnostics include various types of stamped ceramics, copper earspools, stone effigy pipes, Hopewell Cache blades, Snyders points, and Lowe Flared Base points (Kellar 1983:41-45).

Late Woodland and Mississippian (A.D. 500 - 1650)

The transition to the Late Woodland period is marked by the abrupt decline of fluorescent Hopewellian complexes, though in many areas no decline from established regional Middle Woodland patterns is seen (Stoltman 1978:721-22). The early Late Woodland in central and southern Illinois is characterized by cord-marked ceramics and small, scattered sites typical of a generalized economy. Similar cord-marked ceramics are also noted for western Michigan (Fitting 1978:54). The Newtown complex in southern

Ohio and southeastern Indiana includes large villages with circular house plans. Lowe Flared Base points, Chesser Stemmed points, and cord-marked ceramics are characteristic (Griffin 1983:272-273). Villages of the Allison-LaMotte and Albee complexes are found in the middle to lower Wabash Valley. Oval dwellings, Lowe Flared Base points, stamped ceramics, and increasing evidence for plant cultivation, characterize Allison-LaMotte. Excavation of an Albee cemetery revealed tools, beads, gorgets, and cord-marked ceramics with distinctive wedge-shaped rims (Kellar 1983:50). Botanical remains from the Albee complex Morell-Sheets site (12 My 87) in west central Indiana suggest roughly equal use of maize and wild plants at a spring through summer occupation (Bush 1994:7).

Inhabitants of the Midwest became more intensely horticultural after A.D. 900 and established larger, more sedentary villages characterized by house clusters, storage pits, and stockades (Stoltman 1978:723-724). Such changes may be associated with the improved subsistence during the warming of the Secondary Optimum (A.D. 1000-1200), but the trend towards larger settlements is one that began earlier. In the American Bottom the Cahokia site represents Mississippian cultural fluorescence. During Cahokia's apogee (A.D. 950-1300) people engaged in the construction of enormous platform mounds and further evidence for social complexity is seen in elaborate mound burials (Griffin 1983:278-280). Cahokia was linked through cultural similarity and interaction to a number of independently derived expressions throughout the Midwest and southeast. As the largest Mississippian center, Cahokia is thought to have exerted considerable influence throughout this area and at its margins (Stoltman 1978:725; Griffin 1983:280-282). The Angel, Murphy, and Vincennes Complexes represent Mississippian cultural patterns in southern Indiana. The forty-hectare Angel Mounds site and associated villages, hamlets, and camps are located in the southwestern tip of the state along the Ohio and Wabash Rivers. The Angel Mounds site represents a palisaded town with platform mounds, plazas, rectangular house remains, and a main occupation date between 1200 and 1400 A.D. (Griffin 1983:283). Diagnostic artifacts include typically Mississippian ceramic bowls, bottles, plates and jars and small triangular arrow points. Some Angel vessels feature negative painted motifs and effigies (Griffin 1983:286-288). Distinctly less complex Mississippian sites of the Murphy and Vincennes complexes are located along the lower Wabash River in Illinois and Indiana (Griffin 1978:550). The Caborn-Welborn phase of Mississippian, with more dispersed and unfortified settlements, replaces earlier Mississippian occupations in the Ohio/Wabash area after A.D. 1450 and continues until the time of European exploration of eastern North America (Griffin 1983:288).

In contrast to the Mississippian cultural patterns in southern Indiana, the Mississippian cultures in northern Indiana are represented by such cultural expressions as the Huber and Fisher Phases (Faulkner 1972). Archaeological evidence shows that the Mississippian peoples of northern Indiana had semi-permanent village sites in the upland areas during the spring and fall, when crops were being planted and harvested, and seasonal, temporary encampments in the vicinity of the vast marshlands of the area while procuring resources during the summer (Faulkner 1972). Deutchman and Dorwin (1979) and Perkins and Doershuk (1993) note that groups in northern Indiana appear less

dependent on corn than groups further south. They suggest that this is a result of the more uncertain weather conditions and the presence of plentiful marshes, which yielded large amounts of wild floral and faunal resources. This resulted in a return to smaller seasonal camps during the Late Woodland and Mississippian time periods.

Whereas most of the Late Woodland Period for Indiana provides a general image of cultural continuity, the region became relatively depopulated during the centuries before direct European contact (Hicks 1992:42). Population movements probably resulted from indigenous social and ecological factors as well as indirect impacts from European presence on the continent. Newman (1997) notes a cooling temperature trend in North America during the fifteenth and sixteenth centuries, with a thermal minimum being reached near the end of the seventeenth century. This corresponds to the "Little Ice Age" of Europe and may also have had an affect on population movements out of Indiana at that time.

Historic (A.D. 1650 to Present)

Connections between prehistoric and historic Indian groups in Indiana are not clear, although links between the prehistoric Ft. Ancient and historic Shawnee Indians have been suggested. Faulkner (1972) suggests that the Fisher and Huber cultures of northern Indiana are the prehistoric correlates of the Iliniwek or Miami tribes who moved into northern Indiana as a response to pressure from the Iroquois. Faulkner bases this on the comparison of ethnohistorical data and the known subsistence and settlement patterns of the prehistoric inhabitants of the area, as determined from the archaeological record. Both Faulkner (1972) and Secunda et al. (2002) indicate that the Potawatomi had also moved into northern Indiana and inhabited the region by 1500 AD.

In the late 1600's the coastal Iroquois of New York acquired firearms from the Dutch, then preceded to wreck havoc on their neighboring tribes, clearing a vast area north of the Ohio River from New York almost to the Mississippi. A note from the cartographer on "A Map of the British and French Dominions in North America" (Mitchell 1755) records this native expansion:

> The Six Nations (the Iroquois) have extended their territories to the River Illinois since the year 1672 when they subdued and were incorporated with the Ancient Chaouanons, the Native Proprietors of these Countries, and the River Ohio: Besides which they likewise claim a Right of Conquest over the Illinois, and all the Mississippi as far as they extend...

The French restored technological parity by providing firearms to the Iroquois' neighbors, and Miami settlement of the area resumed in Indiana by 1680 (Barnhart and Riker 1971). By 1700 the Wea, Piankashaw, Potawatomi, Kickapoo, and Delaware had followed, as white man's diseases, weapons, and greed first for furs, and then for new lands, decimated the native populations, pushing the Indian ever westward.

Miami Chief Little Turtle laid claim for the Miami, Potawatomi, and Wabash Indians, all the lands contained in Indiana, western Ohio, and the eastern edge of Illinois in a speech to General Wayne at the Treaty of Greenville on August 21, 1795 (Wheeler - Voegelin et al. 1974):

> You have pointed out to us the boundary line between the Indians and the United States; but I now take the liberty to inform you that the line cuts off from the Indians a large portion of country without molestation or dispute. The prints of my ancestor's houses are everywhere to be seen in the portion.... It is well known that my forefather kindled the first fire at Detroit; from thence he extended his lines to the headwaters of the Scioto; from thence to its mouth; from thence down the Ohio to the mouth of the Wabash; and from thence to Chicago, on lake Michigan. At this place I first saw my elder brothers the Shawnees.

Chief Little Turtle at the Treaty of Greenville with the chiefs of eleven other tribes then sold over 25,000 square miles of this land to the United States government for about 3 cents an acre.

The Indians became increasingly alarmed at the loss of their lands to the whites. Chief Tecumseh, an Indian statesman and warrior, began an effort to unite the tribes against the sale of their common lands and with his brother, the Prophet, established the Indian Capitol of "Prophetstown" a few miles east of present day Lafayette. The British, stung by their loss of the colonies, continued to encourage the Indians to resist the new republic while preparing for their attack on the American Capitol in the War of 1812. Locally this resistance resulted in the Battle of Tippecanoe in 1811, when Harrison's troops marched to Prophetstown, defeated the Indians, and burned the town. The armed resistance to the white expansion in Indiana was over. By 1840, except for small isolated bands, the native populations had been "removed" to lands "forever theirs" west of the Mississippi. Prior to this removal, northern Indiana contained 36 Potawatomi and 23 Miami communities (Tanner 1987).

The Treaty of Mississinewa in 1826 and the Treaty of Tippecanoe in 1832 made the lands that are currently Marshall and St. Joseph Counties available for settlement. Many of the first settlers of this area migrated northward along the state's first north-south highway, the Michigan Road, which was surveyed through the area in 1828, made "passable to wagons" by 1834, and completed in 1837 (Montgomery 1902, Prather 1941, Taylor 1989) (Figure 5). According to Prather (1941), "…with only a few minor changes in routing, this road, …still curves up across Indiana from Madison in southeastern Indiana to Michigan City in the northwestern corner of the state… and is now designated as…Highway 31 from Rochester to South Bend." As Secunda et al. (2002) point out, the Michigan Road followed an older Indian trail through what is now Marshall and St. Joseph Counties. A brief history and background of Marshall and St. Joseph Counties are provided below.

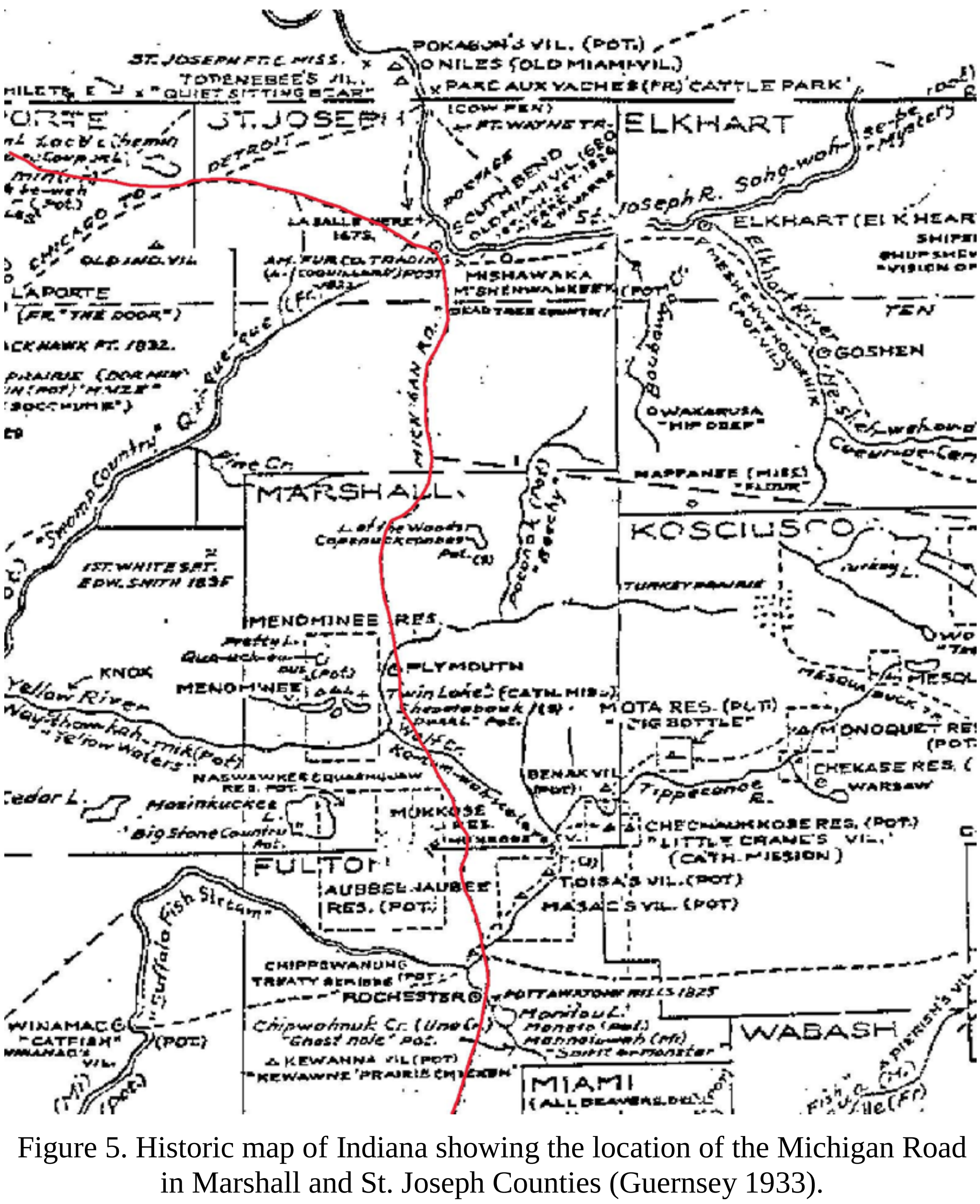

Figure 5. Historic map of Indiana showing the location of the Michigan Road in Marshall and St. Joseph Counties (Guernsey 1933).

Marshall County

Marshall County (Figure 6) was formed in 1835 and organized in 1836. The county was named for United States Supreme Court Chief Justice John Marshall (Taylor et al. 1989; Baker and Carmony 1975). Plymouth was platted in 1834, was established as the county seat in 1836, was incorporated as a town in 1851, and reached city status in 1873 (Taylor et al. 1989). Marshall County was originally part of the territory belonging to the Menominee tribe of the Potawatomi Indians, which was ceded in the government purchase under the 1832 treaty of Tippecanoe River (Taylor et al. 1989). However, it was not until after 1838, when the Potawatomi Indians were forcibly removed during the infamous "Trail of Death" march, that this area became open for large scale white settlement (Taylor et al. 1989; Tanner 1987).

The current US 31 Study Area encompasses two of the ten civil townships within Marshall County. These are Center and North Townships, which were two of the three original townships organized in 1836 and 1838, respectively (Historic Landmarks Foundation 1990).

Marshall County relies heavily on agriculture as the basis for its economy. Agriculture within the county was difficult at first, due to the necessity of having to drain the marshlands that made up a large part of the county, especially in the northern portion (Taylor et al. 1989; Historic Landmarks Foundation 1990). Brant and Fuller (1890) provide an in depth discussion on the draining of the areas that were once impassable bogs but are now fertile lands, excellent for farming with very productive soils. The primary crops grown in Marshall County include onions, mint, corn, oats, potatoes, and hay, all of which grow in the muck created by draining the marshlands, while orchards abound in the highland areas (Taylor et al. 1989).

St. Joseph County

St. Joseph County (Figure 7) was organized in 1830 by the Indiana state legislature, with South Bend named as the county seat. Initially, the western boundary of St. Joseph County extended to the state's western border. After several alterations, the existing boundaries were formed in 1850. The county was named after the St. Joseph River, which flows through the county (Taylor et al. 1989; Baker and Carmony 1975).

The area that eventually became the city of South Bend was first explored in 1679 by French explorers, including La Salle, who canoed up the St. Joseph River and crossed the Kankakee-St. Joseph portage. Europeans did not settle permanently in the area until the 1800's, the earliest being the fur traders. South Bend grew out of a small settlement that was in the vicinity of two trading posts along the St. Joseph River. The settlement received a large boost from the construction of the Michigan Road, which played an integral role in the settlement of north-central Indiana (Prather 1941; Taylor et al. 1989). The population of St. Joseph County was 287 in 1830 and had increased to 6,415 by 1840 (Prather 1941).

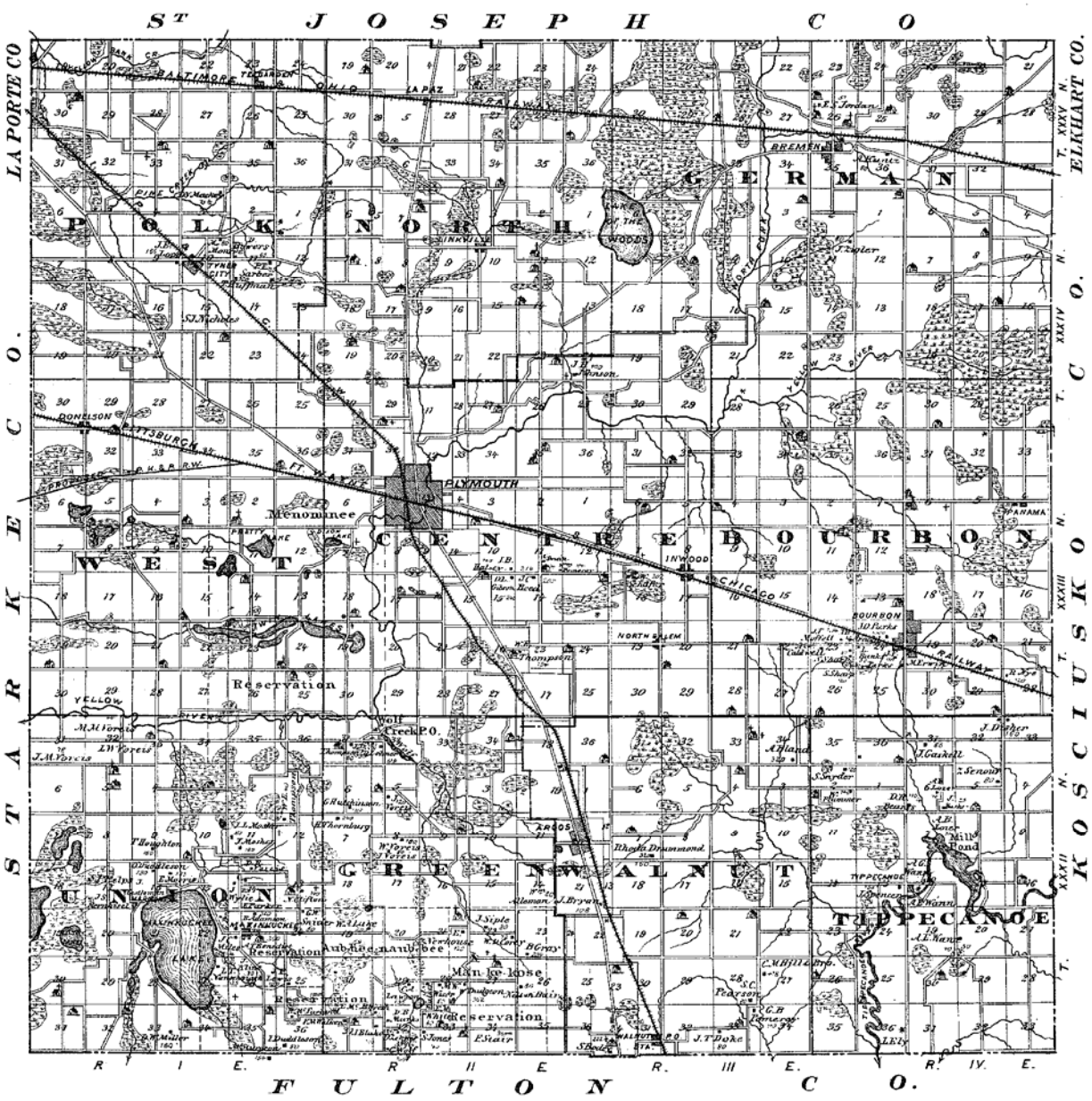

Figure 6. 1876 Map of Marshall County (Indiana Historical Society 1968).

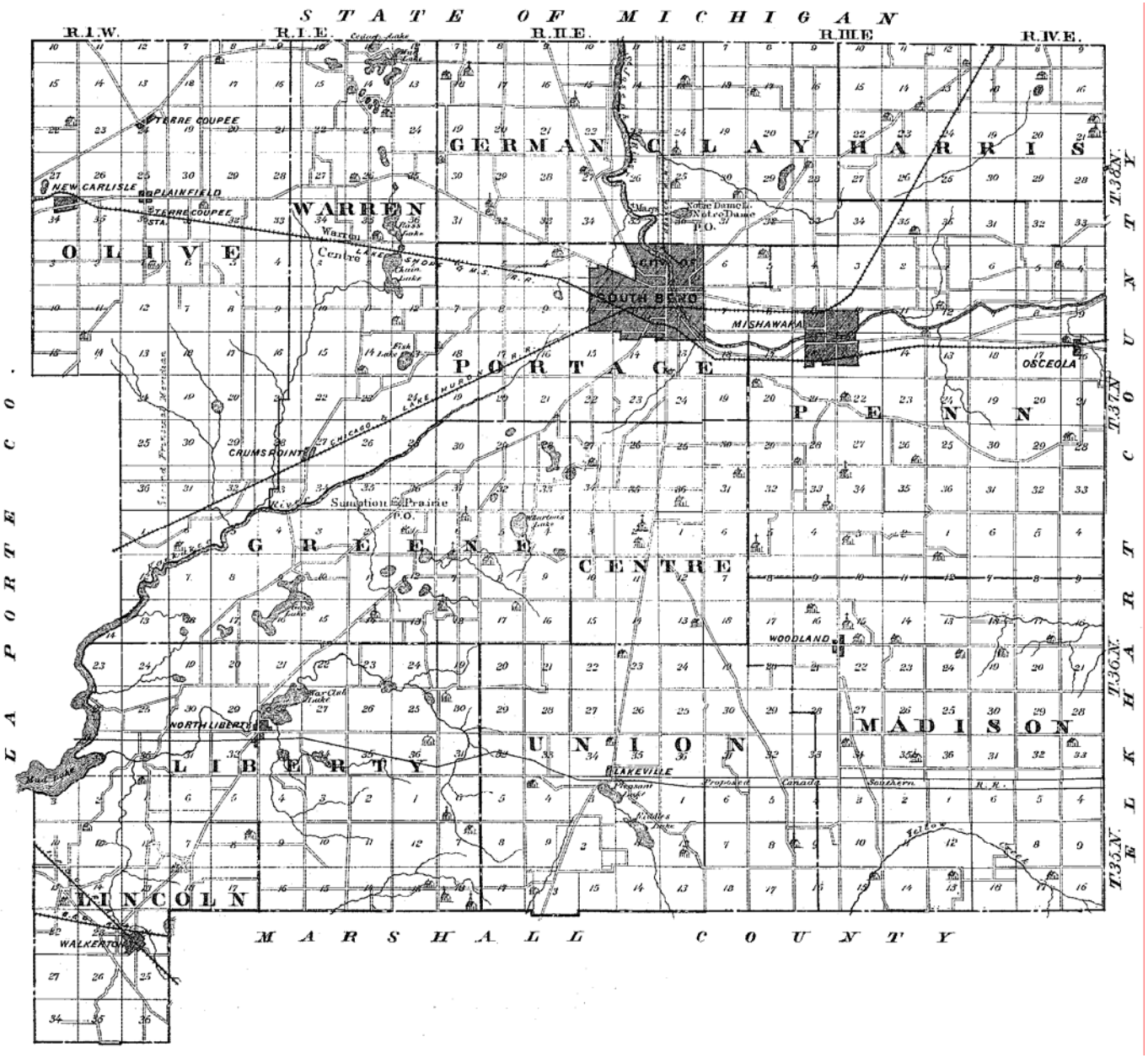

Figure 7. 1876 Map of St. Joseph County (Indiana Historical Society 1968).

The area under consideration for the US 31 project includes three of the thirteen civil townships of St. Joseph County. These townships are Center, Portage, and Union. Portage Township was one of the four original townships in St. Joseph County organized in 1830. Center Township was formed in 1831, and Union Township was formed in 1836. Re-organization of the townships continued until the present thirteen were arrived at when the final county boundaries were determined in 1850 (Taylor et al. 1989).

Like Marshall County, St. Joseph County also has rich farmland as a result of draining the marshlands, with fruit and grain being the principal crops grown (Taylor et al. 1989). However, the county also has a strong industrial base concentrated in the adjoining cities of South Bend and Mishawaka, which lie along the St. Joseph River. Many of the early enterprises relied on the river itself, including power produced by two man-made races on either side of the river in the city of South Bend. The three dominant early businesses in South Bend were the Studebaker Wagon Works (which later switched to automobile manufacturing), The Oliver Plow Company, and the Singer Sewing Machine Company. Today, the economy of this area still relies on manufacturing, but is much more diversified then in earlier years (Taylor et al. 1989).

METHODS

The archaeological records check and literature search for this project utilized the resources of several organizations and facilities in order to provide a complete and comprehensive listing of the previously documented archaeological sites present within the Study Area. In addition, previous archaeological research and compliance projects within and around the proposed alternatives were examined in order to determine the potential for the Study Area to contain archaeological resources.

The primary data for this project came from archaeological site forms, a computer database, topographic maps, and archaeological reports on file at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). In addition, reports on file at Landmark Archaeological and Environmental Services, Inc. that contained information regarding previous archaeological investigations in the Study Area were also examined.

Additional information about the Study Area was collected from various historic maps and documents on file at the Indiana State Library, the Marshall County Historical Museum, and the St. Joseph County Library. These documents included original county histories, such as the *History of St. Joseph County* (Chapman & Co. 1880), *History of Indiana: Special Edition for Marshall County* (Brant and Fuller 1890), *A History of St. Joseph County, Indiana* (Howard 1907), *A Twentieth Century History of Marshall County, Indiana* (McDonald 1908), and *An Account of St. Joseph County from Its Organization* (Stoll 1923). County and state maps, road maps, and plat maps from the late nineteenth and early twentieth centuries were also studied in order to assess the potential for historic archaeological sites within the project area

The cemetery data for Marshall and St. Joseph Counties was obtained from the cemetery database records at IDNR, DHPA, USGS 7.5 minute topographic maps, county interim reports, and records at the Indiana State Library. This was done in order to assist in the recommendations of avoidance for the known historic cemeteries affected by the study alternatives. The cemetery database at IDNR, DHPA for Marshall and St. Joseph Counties is currently in progress and has not yet been completed for either county.

RESULTS

Previous Archaeological Studies

It is important to note that there has been very little archaeological research done in north-central Indiana as compared to the remainder of the state, resulting in a limited understanding of the prehistory of this area (Deutchman and Dorwin 1979; McGowan et al. 1998; Schurr 2003a). The majority of archaeological studies in northern Indiana have concentrated in the northeastern or northwestern portions of the state, particularly along the major drainages such as the Kankakee River and lower St. Joseph River, as well as along Lake Michigan. These studies have tended to focus on Middle Woodland, Late Woodland, and Mississippian cultural manifestations (Faulkner 1960, 1972; Garland and Clark 1981; Mangold 1997; Schurr 1993, 1996, 2003a, 2003b). Faulkner (1972:14) notes that the early archaeological investigations in northern Indiana were “mound-oriented” and failed to mention any other prehistoric cultures other than what was similar to Middle Woodland Hopewellian expressions. As Secunda et al. (2002:14) state, “in general, differences in cultural occupations across northern Indiana are better known for Late Prehistoric occupations than they are for earlier ones”, which in turn may be the result of this earlier “mound-oriented” focus.

Professionals unfortunately often refer to the north-central portion of the state as an “archaeological void”. That is not to say that archaeological sites do not exist, only that very little work has been done in the way of recording them. Schurr (2003a) points out that the area south and east of the Kankakee drainage, where the current US 31 Study Area is located, has been particularly neglected by archaeological research within the state.

Some of the basic framework for the understanding of the prehistory of the last millennium for northwestern Indiana has come from investigations of the Moccasin Bluff Site located in the lower St. Joseph River Valley in southwestern Michigan (Schurr 2003a). Moccasin Bluff is a large multi-component site located on a terrace near the St. Joseph River that was occupied for approximately 8,000 years. According to Fitting (1970), this site was excavated in 1948 by the University of Michigan and is the most extensively excavated site in southwestern Michigan. The Upper Mississippian components at the Moccasin Bluff Site are very similar to the Fisher and Huber Phases of northwestern Indiana, as defined by Faulkner (1972), and may indicate an expansion of these cultural traits into southwestern Michigan from northwestern Indiana (McAllister 1999).

Other studies conducted in southwestern Michigan also indicate prehistoric cultural ties to northern Indiana (Garland 1986; Garland and Mangold 1980; Garland and Clark 1981; Mangold 1981). Again, some of these cultural comparisons focus on Woodland and Mississippian traditions. However, Mangold (1981) does discuss the presence of a sparse number of Paleo-Indian sites as well as a number of Archaic sites in his survey of the Galien River Basin, portions of which extend into northern Indiana and St. Joseph County (Mangold 1981). In addition, sites excavated in the right-of-way of US 31 project in Berrien County, Michigan (Garland and Clark 1981) revealed Late Archaic occupations on several of the sites. The topographic settings of the archaeological sites discussed in these investigations may help to assess the potential for the presence of archaeological sites in similar topographic settings within the current US 31 Study Area.

One of the best sources on information on the prehistoric resources of the Study Area comes from Ervin Stuntz, an amateur historian with a keen interest in the prehistory of northern Indiana. His works, *The Incredible Wheel of Time* Vols. I and II (Stuntz 1983 and 1984), while not professional studies, do provide information pertaining to the locations of Indian villages and burial grounds in Marshall and St. Joseph Counties based on interviews with local artifact collectors. These works were also examined as part of the background research for this project, and may provide relevant information that can be utilized upon commencement of actual archaeological fieldwork. A few of the sites Stuntz describes do roughly correspond to previously recorded archaeological sites.

Marshall County

In 1959-1960, Charles Faulkner undertook the first, and really only, major professional attempt to survey and document archaeological resources in Marshall County (Faulkner 1961). It should be noted that while Faulkner surveyed many of the sites he recorded, some of the sites were recorded based on information he obtained from interviews with local artifact collectors. Faulkner (1961) recorded 316 sites within Marshall County, with 35 archaeological sites being recorded within Center Township and 15 archaeological sites being recorded within North Township. Bellis (1975) states that Faulkner “had produced the most complete and accurate data available” for the northern quarter of Indiana.

Faulkner (1961) noted that the vast majority of the sites he recorded were seasonal, Woodland period hunting and collecting sites, as opposed to the permanent villages found elsewhere in the state for this time period. These sites were located on sand ridges and knolls of eolian origin, which would have been the only areas suitable for habitation within the vast marshlands of the county that existed prior to the draining that occurred during historic times. Faulkner also points out that prehistoric groups in this area appeared to be less dependent on horticulture than elsewhere during the same time frame due to the presence of other rich natural resources in the form of abundant marshland flora and fauna.

Another archaeological study conducted in Marshall County was the excavation of the Rouch Site in the western part of the county, by personnel from the University of

Notre Dame (Bellis 1975). The Rouch Site was originally identified by Faulkner and is an Early Archaic to Mississippian lithic workshop. It is the only site of this type excavated in northern Indiana (Bellis 1975).

Other archaeological investigations conducted in Marshall County include various small-scale compliance projects such as road improvements, developments, and proposed cellular phone tower locations. Three of these studies were found to have been conducted within the two-mile wide study bands of the four current US 31 alternatives (Buehrig 1986, Stillwell 2000b, 2000c). None of these surveys revealed evidence of archaeological resources; however, this may be in part due to the small size or the previously disturbed nature of the project areas. One additional survey (Fabyan 1978), which was conducted on the west side of the town of Plymouth and near the southern terminus of the current US 31 Study Area, recorded four archaeological sites.

A recent research project conducted by personnel from the University of Notre Dame (Secunda et al. 2002) involves the investigation of historic Potawatomi villages in northern Indiana. The project used the original General Land Office (GLO) records to assist in locating these villages, which had been in existence up until the removal period in the late 1830s. This study does involve portions of Marshall County, although the specific areas surveyed are outside of the current US 31 Study Area.

To date there are 383 archaeological sites recorded in Marshall County. As discussed above, Faulkner (1961) recorded 316 of these sites. As can be determined from this data, very few archaeological sites have been recorded in Marshall County in the past 40 years. This again points to the lack of archaeological work having been completed in this county, not the paucity of archeological sites themselves.

St. Joseph County

There are 418 archaeological sites recorded in St. Joseph County to date. Although there has been no systematic countywide survey undertaken in St. Joseph County, several larger archaeological surveys have been conducted including various highway corridor studies and other compliance projects.

Soil Systems, Inc. in 1979 (Deutchman and Dorwin 1979) and Resource Analysts, Inc. in 1980 (Bouchard and Dorwin 1981) both surveyed routes around South Bend as part of the US 20 bypass corridor study. The 1979 survey recorded 269 archaeological sites (197 of which were isolated artifact finds) and the 1980 survey recorded 54 additional archaeological sites. Deutchman and Dorwin (1979:9) note that prehistoric cultural remains were found in both upland settings and depressional areas that once bordered glacial ponds and lakes, and marshes. They also concluded that north-central Indiana was not extensively occupied during prehistoric times, a fact which is not just the result of the lack of archaeological investigation in the area but is based on the results of their survey (Deutchman and Dorwin 1979).

These two surveys account for a large portion of the archaeological sites recorded for St. Joseph County. Some of these sites fall within and portions of these surveys cross the current US 31 Study Area, as will be discussed below. However, it should be noted here that the 1979 survey did not assign state site numbers to the 197 isolated artifact finds recovered from this survey, as far as could be determined from the information available at the IDNR, DHPA.

The original survey for the U.S. 20 bypass corridor study (Deutchman and Dorwin 1979) contains two corridor alternates that partially overlap the current US 31 Study Area. These are the western end of "Original Line N" and the western portion of the "Southern Alternate", both of which cross portions of the four current US 31 alternatives (Cs, Es, G-Cs, and G-Es). One archaeological site (12-Sj-26) and seven archaeological isolated finds (I-Sj-1, 2, 3, 4, 14, 20, and 21) were found during this survey that fall into the current US 31 Study Area (see Table 5 below in the Archaeological Resources section).

The 1981 survey for the U.S. 20 bypass corridor study (Bouchard and Dorwin 1981) also overlaps the current US 31 Study Area. The western end of survey Line N of the U.S. 20 project also falls into portions of the four current US 31 alternatives (Cs, Es, G-Cs, and G-Es). However, no evidence of archaeological resources was found in that portion of the U.S. 20 project that overlaps the current US 31 Study Area.

Other smaller compliance projects have also been conducted near the current US 31 Study Area within St. Joseph County. Most of these were road improvement projects, development projects, and proposed cellular phone tower locations (Bellis n.d., 1983; Cantin 1995a, 1995b; Cochran 1999a, 1999b; Dietrich 1985; Helmkamp et al. 2000; Helmkamp and Javorsek 2001; Keener 2000a, 2000b; Maust 1987; Stillwell 1997, 2000a, 2000d, 2002; Tomak 1987; Tonetti 1976; Verbka 1994; Wappenstein 1999).

Of the above referenced smaller compliance projects, eleven have been conducted within the current US 31 Study Area (Bellis 1983; Cantin 1995a, 1995b; Cochran 1999a; Helmkamp and Javorsek 2001; Stillwell 1997, 2000a, 2000d, 2002; Verbka 1994; Wappenstein 1999). These investigations are correlated by alternative in the following table.

Table 3. Previous small archaeological surveys conducted within the Study Area.

Survey	**Study Band**	**Study Corridor**	**Working Alignment**
Bellis 1983	Cs, Es, G-Cs, G-Es		
Cantin 1995a	Cs, Es, G-Cs, G-Es	Cs, Es, G-Cs, G-Es	Cs, G-C
Cantin 1995b	Cs, Es, G-Cs, G-Es		
Cochran 1999a	Cs, Es, G-Cs, G-Es	Es, G-Es	
Helmkamp/Javorsek 2001	Cs, Es, G-Cs, G-Es	G-Cs, G-Es	
Stillwell 1997	Cs, Es, G-Cs, G-Es		
Stillwell 2000a	Cs, Es, G-Cs, G-Es	G-Cs, G-Es	
Stillwell 2000d	Cs, Es	Cs, Es	

Survey	Study Band	Study Corridor	Working Alignment
Stillwell 2002	Cs, Es	Cs, Es	
Verbka 1994	Cs, Es, G-Cs, G-Es		
Wappenstein 1999	Cs, Es, G-Cs, G-Es	G-Cs, G-Es	

None of these eleven previously conducted archaeological investigations found any evidence of archaeological resources. However, this once again may be due to the small size of these project areas or the previously disturbed nature of some of the project areas.

Another larger archaeological investigation within St. Joseph County was the excavation of the Bellinger Site (12-Sj-6) in western St. Joseph County during the early and mid 1990s by the University of Notre Dame. Excavation of this site provided new insight into the Goodall Tradition in northern Indiana (Schurr 1996, 1997) by showing evidence of a regional interaction model for the Early Middle Woodland Goodall Tradition and indicating that the Goodall Tradition is a regional variant of Havana Hopewell Tradition from Illinois (Schurr 1997). Schurr (1997) states that the Bellinger Site is located in a similar topographic setting as other Goodall Tradition mound sites and is situated on a terrace edge adjacent to marshland. Schurr (1997) also notes that Goodall habitation sites are common on dunal islands within the meander belt of the Kankakee River Valley, as well as in the uplands bordering marshes.

An additional area in St. Joseph County where archaeological work has been concentrated is Potato Creek State Recreational Area, which is located just west of the current US 31 Study Area. Several archaeological surveys and one test excavation have been conducted within the park boundaries (Koleszar 1976, 1977; Waters 2001).

Archaeological Resources

There are six previously recorded archaeological sites in Marshall County and 25 previously recorded archaeological sites in St. Joseph County that are located within the two-mile wide study bands examined for the current US 31 Study Area. The following tables list each archaeological site within these study bands, by county, along with cultural affiliations, site descriptions, and recommendations.

Table 4. Previously recorded archaeological sites within the Study Bands of the alternatives in Marshall County.

Site Number	Cultural Affiliation	Site Description	Recommendations	Comments
12-Mr-219	Unidentified Prehistoric	Habitation	None Given	
12-Mr-221	Unidentified Prehistoric	Habitation	None Given	
12-Mr-234	Unidentified Prehistoric	Habitation	None Given	Destroyed?

Site Number	Cultural Affiliation	Site Description	Recommendations	Comments
12-Mr-235	Unidentified Prehistoric	Habitation	None Given	Partially Destroyed
12-Mr-308	Unidentified Prehistoric	Habitation	None Given	Possibly Destroyed
12-Mr-318	Unidentified Prehistoric	Habitation	None Given	

Table 5. Previously recorded archaeological sites within the Study Bands of the alternatives in St. Joseph County.

Site Number	Cultural Affiliation	Site Description	Recommendations	Comments
12-Sj-26	Historic	Farmstead	Intensive Survey	
12-Sj-235	Middle Woodland	Isolate	No Further Work	
12-Sj-238	Unidentified Prehistoric	Isolate	No Further Work	
12-Sj-239	Historic	Scatter	No Further Work	
12-Sj-250	Unidentified Prehistoric/Historic	Camp and Historic Trading Post	Further Work Recommended	
12-Sj-251	Early Archaic to Late Woodland	Habitation	None Given	Collector Report/ Destroyed
12-Sj-252	Unidentified Prehistoric	Camp	Field Survey and Assessment	Collector Report
12-Sj-253	Middle Woodland	Camp	Field Survey and Assessment	Collector Report and Possibly Destroyed
12-Sj-255	Unidentified Prehistoric	Camp	Field Survey and Assessment	Collector Report
12-Sj-256	Archaic and Early Woodland	Camp	Field Survey and Assessment	Collector Report
12-Sj-260	Middle Woodland (Hopewell)	Isolate	Field Survey and Assessment	Collector Report
12-Sj-265	Woodland	Camp	Field Survey and Assessment	Collector Report
12-Sj-266	Unidentified Prehistoric	Camp	Field Survey and Assessment	Collector Report
12-Sj-270	Historic Native American	Burials	Field Survey and Assessment	Collector Report
12-Sj-271	Paleo-Indian	Isolate	Field Survey and Assessment	Collector Report
12-Sj-272	Unidentified Prehistoric	Camp	Field Survey and Assessment	Collector Report

Site Number	Cultural Affiliation	Site Description	Recommendations	Comments
12-Sj-289	Early Woodland	Isolate	No Further Work	
12-Sj-290	Late Archaic (Lamoka)	Camp	No Further Work	
I-Sj-1	Unidentified Prehistoric	Isolate	No Further Work	
I-Sj-2	Unidentified Prehistoric	Isolate	No Further Work	
I-Sj-3	Late Woodland/Mississippian	Isolate	No Further Work	
I-Sj-4	Late Archaic (Brewerton)	Isolate	No Further Work	
I-Sj-14	Unidentified Prehistoric	Isolate	No Further Work	
I-Sj-20	Early Woodland	Isolate	No Further Work	
I-Sj-21	Unidentified Prehistoric	Isolate	No Further Work	

The following table lists those archaeological sites described in the tables above that are located within the 2000-foot wide study corridors of the alternatives. The table also indicates whether or not a particular archaeological site falls within the working alignment of an alternative.

Table 6. Previously recorded archaeological sites within the Study Corridors and Working Alignments of the alternatives.

Site Number	Study Corridor Alternatives				Working Alignment Alternatives			
	Cs	Es	G-Cs	G-Es	Cs	Es	G-Cs	G-Es
12-Mr-308	X	X	X	X	X	X	X	X
12-Mr-318	X	X	X	X	X	X	X	X
12-Sj-26		X		X		X		
12-Sj-250			X	X				
12-Sj-270			X	X				
I-Sj-2			X					
I-Sj-4		X		X				
I-Sj-20	X		X					
I-Sj-21	X		X					

In addition to the previously recorded archaeological sites discussed above, there is also one archaeological site that is located east of the town of Lakeville for which the exact location and site type are unknown. According to William Mangold of the IDNR, DHPA (personal communication 2003) the existence of this site was reported by E. H. Young, who was an artifact collector from approximately 1890 to 1950. A map obtained from the IDNR, DHPA indicates that the site is located not only within the two-mile wide

study bands of the alternatives for the current US 31 Study Area but also within the 2000-foot wide study corridors of Alternatives G-Cs and G-Es.

Cemeteries

There are five known historic cemeteries located within the two-mile wide study bands in Marshall County and five known historic cemeteries located within the two-mile wide study bands in St. Joseph County. These cemeteries are listed in the following tables.

Table 7. Known cemeteries within the Study Bands in Marshall County.

Cemetery Name	**Quad**	**Township**	**Dates**	**Interim Report #**
Fairmount (Vinnedge)	La Paz	North	1834-present	05027
Jacoby	Plymouth (unnamed)	Center	1850-1930	20023
Mount Zion (County Line)	La Paz	North	1909-present	05003
Seltenright	La Paz (unmarked)	North	1880's (graves supposedly moved to Fairmount)	
White	La Paz (unnamed)	North	1871-1902	05015

Table 8. Known cemeteries within the Study Bands in St. Joseph County.

Cemetery	**Quad**	**Township**	**Dates**
Henson	Lakeville (unmarked)	Center	1840's-1909
Lakeville	Lakeville	Union	Unknown
Mount Calvary	Lakeville	Center	Unknown
Rohrer	South Bend East	Center	Unknown
Southlawn (Palmer Prairie)	Lakeville	Center	Active

The following table lists those cemeteries described in the tables above that are also located within the 2000-foot wide study corridors of the alternatives. None of the cemeteries fall within the working alignments of these alternatives.

Table 9. Known cemeteries within the Study Corridors.

Cemetery Name	**Alternatives**			
	Cs	**Es**	**G-Cs**	**G-Es**
Henson			X	X
Seltenright	X	X	X	X
Southlawn (Palmer Prairie)		X		X
White	X	X	X	X

RECOMMENDATIONS

Due to the large size of the US 31 Plymouth to South Bend project area and the fact that the vast majority of the project area has not been surveyed by a professional archaeologist, there is potential for additional archaeological sites to be found in those areas of similar topography to that of the previously recorded archaeological sites in the region. In addition, the project will be impacting previously undisturbed property. Therefore, it is recommended that a Phase Ia archaeological field reconnaissance be conducted on the final preferred alternative of project prior to any construction activities.

This study was conducted per guidelines in "The Management of Archaeological Resources, The Airlie House Report" (McGimsey and Davis 1977), and the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology's "Guidebook: Indiana Historic Sites and Structures Inventory - Archaeological Sites (1989 edition)". The study is in compliance with recent amendments to the Indiana Historic Preservation Act (IC 14-21-1). The archaeological records check, GIS-based archaeological analysis, and the report and recommendations have been accomplished or directly supervised by a Professional Archaeologist meeting the standards set forth by the U.S. Department of the Interior detailed in 36 CFR Part 61, and 66, and the Secretary of Interior's "Standards and Guidelines for Historic Preservation and Archaeology" (48 FR 44716).

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Phase Ia Archaeological Field Reconnaissance

INDOT Project #NH-153-7 (023), Des. Nos. 9904300 and 9904310;
US 31 Improvement Project in Marshall and St. Joseph Counties, Indiana.

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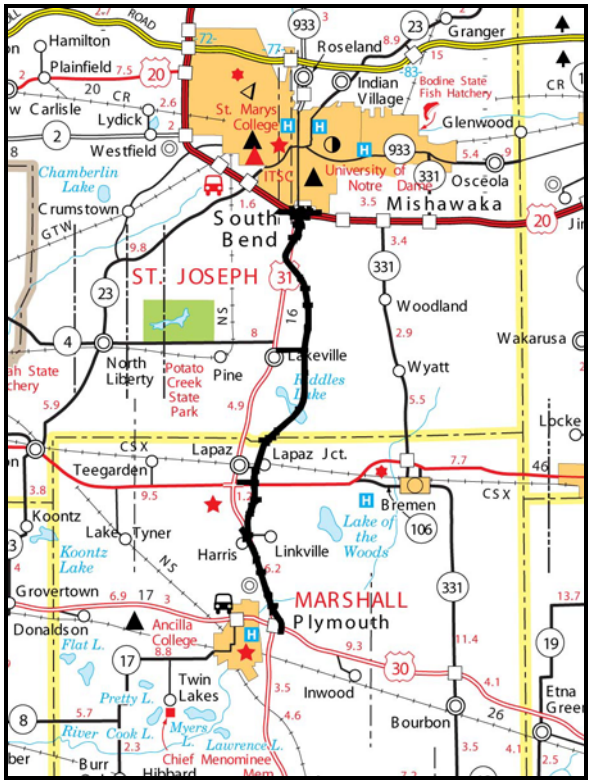
Revised:
March 29, 2006

Report of Investigations: 03IN0013-P1r01



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MANAGEMENT SUMMARY

In response to a request from Bernardin - Lochmueller & Associates, Inc., a Phase Ia archaeological field reconnaissance has been conducted on the proposed US 31 Improvement Project in Marshall and St. Joseph Counties, Indiana (Indiana Department of Transportation [INDOT] Project #NH-153-7 (023), Des. Nos. 9904300 and 9904310). This project is approximately 20 miles (32.2 kilometers) long, beginning at the interchange of US 31 and US 30 in Plymouth, Marshall County, Indiana, and extending north to the US 31 interchange with US 20 in South Bend, St Joseph County, Indiana. The project has an average right-of-way width of 300 feet (91.44 meters) and will require approximately 1011 acres (409.15 hectares) for the construction of a new highway corridor including new interchanges, overpasses, improvements to existing US 6, and several county and residential roads adjacent to the project.

An archaeological records check was conducted for several alternates of the proposed project at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA) during the alternative selection process (Carson and Plunkett 2003). Three previously recorded archaeological sites, 12-Mr-308, 12-Mr-318, and 12-Sj-26 were noted within, or very near the proposed new alignment right-of-way. No known cemeteries were found to be located within the project area.

Three previously recorded archaeological sites (12-Mr-308, 12-Mr-318, and 12-Sj-26) were resurveyed and twenty previously undocumented archaeological sites (12-Mr-413 to 419 and 12-Sj-420 to 432) were discovered during the Phase Ia field reconnaissance of the project area. The following recommendations are submitted as a result of the study:

State Site #	**Site Type**	**Recommendations**
12-Mr-308	Unknown Prehistoric	No further work is recommended
12-Mr-318	Unknown Prehistoric	No further work is recommended
12-Mr-413	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Mr-414	Prehistoric Isolate	No further work is recommended
12-Mr-415	Historic Artifact Scatter	No further work is recommended
12-Mr-416	Historic Farmstead	No further work is recommended
12-Mr-417	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Mr-418	Historic Farmstead	No further work is recommended
12-Mr-419	Prehistoric Isolate	No further work is recommended
12-Sj-26	Historic Farmstead	No further work is recommended
12-Sj-420	Prehistoric Isolate	No further work is recommended
12-Sj-421	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-422	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Sj-423	Prehistoric Isolate	No further work is recommended

State Site #	Site Type	Recommendations
12-Sj-424	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Sj-425	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-426	Prehistoric Isolate	No further work is recommended
12-Sj-427	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-428	Prehistoric Camp	No further work is recommended
12-Sj-429	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-430	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-431	Prehistoric Isolate	No further work is recommended
12-Sj-432	Prehistoric Lithic Scatter	No further work is recommended

It is the opinion of this archaeologist, based on the results of the Phase Ia archaeological field reconnaissance and other available information, that the proposed project should have no effect on significant archaeological resources meeting the criteria established for inclusion to the Indiana Register of Historic Sites and Structures or the National Register of Historic Places. Federal and State environmental provisions concerning the identification of archaeological resources have been accomplished and it is recommended that the project be allowed to proceed as planned. This is with the understanding that if human remains, features, or midden deposits are revealed during construction, all ground disturbing activities will cease, the IDNR, DHPA and INDOT will be contacted within two business days, and work will not resume in the area of the discovery until archaeological clearance is obtained.

This study was conducted in accordance with guidelines in "The Management of Archaeological Resources, The Airlie House Report" (McGimsey and Davis 1977), and revisions to the "Guidebook for Indiana Historic Sites and Structures Inventory-Archaeological Sites, 1989", issued by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology. The study is in compliance with recent amendments to the Indiana Historic Preservation Act (IC 14-21-1). All fieldwork, laboratory analysis, and report preparation have been performed or directly supervised by a Professional Archaeologist meeting the standards set forth by the U.S. Department of the Interior detailed in 36 CFR Part 61, and 66, and the Secretary of Interior's "Guidelines for Historic Preservation and Archaeology" (48 FR 44716).

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PROJECT DESCRIPTION

In response to a request from Bernardin - Lochmueller & Associates, Inc., a Phase Ia archaeological field reconnaissance has been conducted on the proposed US 31 Improvement Project in Marshall and St. Joseph Counties, Indiana (Indiana Department of Transportation [INDOT] Project #NH-153-7 (023), Des. Nos. 9904300 and 9904310). This project is approximately 20 miles (32.2 kilometers) long, beginning at the interchange of US 31 and US 30 in Plymouth, Marshall County, Indiana, and extending north to the US 31 interchange with US 20 in South Bend, St. Joseph County, Indiana (Figure 1).

The project has an average right-of-way with of 300 feet (91.44 meters) and involves a total of approximately 1011 acres (409.15 hectares) of property on both existing and new alignment. It is located in Sections 34, 35, 27, 22, 15, 16, 9, and 4, Township 34 North, Range 2 East; Sections 33, 28, 27, 22, 15, 14, 12, and 1, Township 35 North, Range 2 East; Sections 36, 25, 24, 13, 12, 11, and 2, Township 36 North, Range 2 East; Sections 35, 36, 25, and 26, Township 37 North, Range 2 East, and Section 30, Township 37 North, Range 3 East as shown on portions of the USGS 7.5 minute series Plymouth, La Paz, Bremen, Lakeville, Wyatt, South Bend West, and South Bend East, Indiana quadrangles (Figures 2 - 5).

The purpose of this study was to locate archaeological resources within the project area and determine their potential eligibility for listing in the Indiana Register of Historic Sites and Structures (IRHSS) or the National Register of Historic Places (NRHP).

ENVIRONMENTAL SETTING

Physiography

The project area is located within the Northern Moraine and Lake physiographic region, Steuben Moraine and Lake Area, which Schneider (1966: 52-53) describes as a region of complex topography and physiographic history with relatively rugged relief. The area contains a variety of glacial and postglacial landforms that were created during the advance and retreat of the Huron-Saginaw and Ontario-Erie Lobes of the Wisconsin ice sheet about 15,000 years ago. Knob-and-kettle end moraine topography is evident, with many of the knobs being kames formed by sediments carried by the rivers within the ice sheet itself. Thousands of lakes and peat bogs characterize the Steuben Moraine and Lake Area along with abundant meltwater channels, small lacustrine plains, and occasional sand dunes.

Homoya et al. (1985) show the project to be located within the Northern Lakes Natural Region, which is identified by the presence of numerous freshwater lakes of glacial origin. This region was invaded from the northwest by the Lake Michigan Lobe of the late Wisconsin ice sheet, from the northeast by the Saginaw Lobe, and from the east

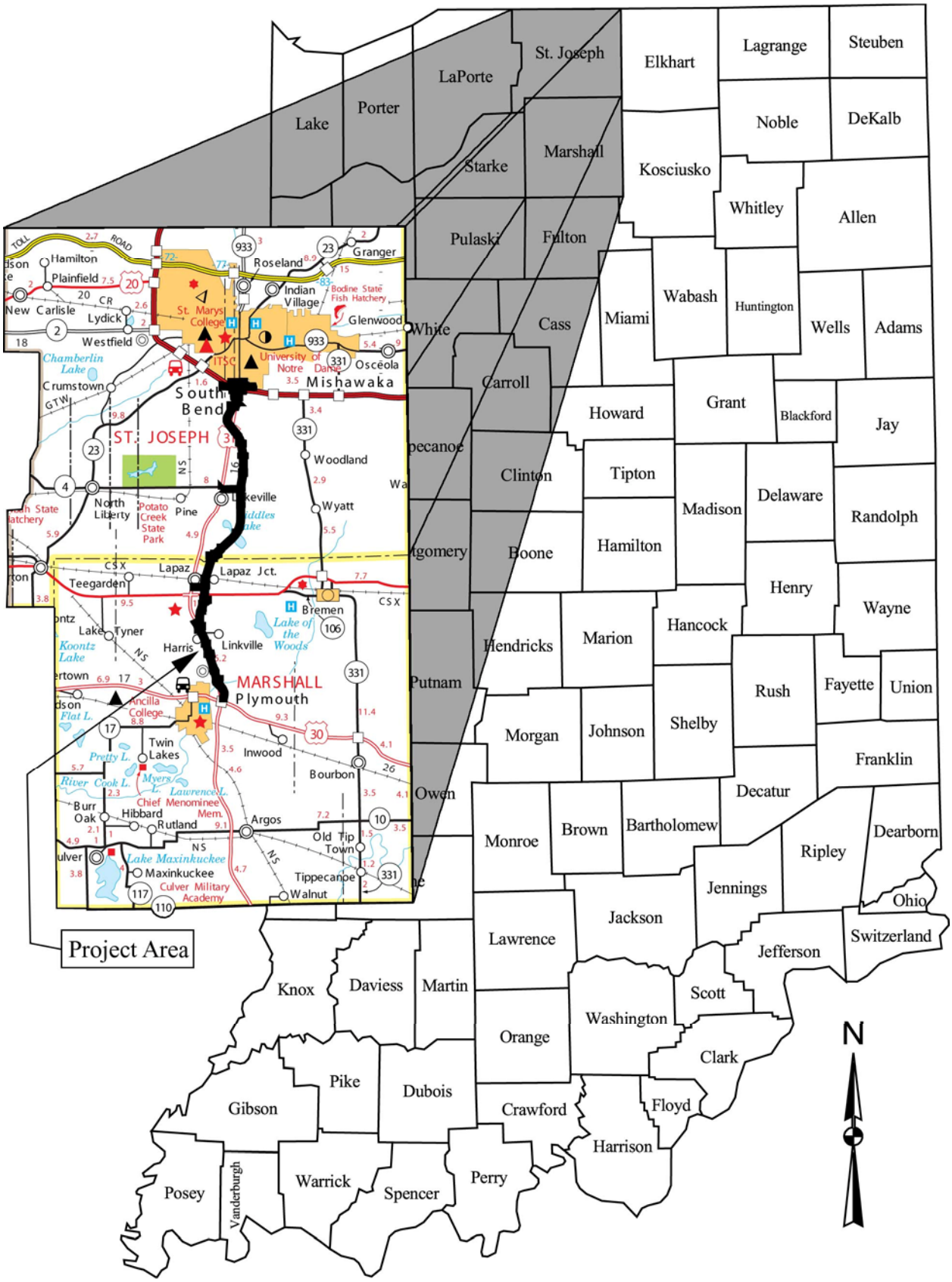

Figure 1. Location of Project Area in Marshall and St. Joseph Counties, Indiana.

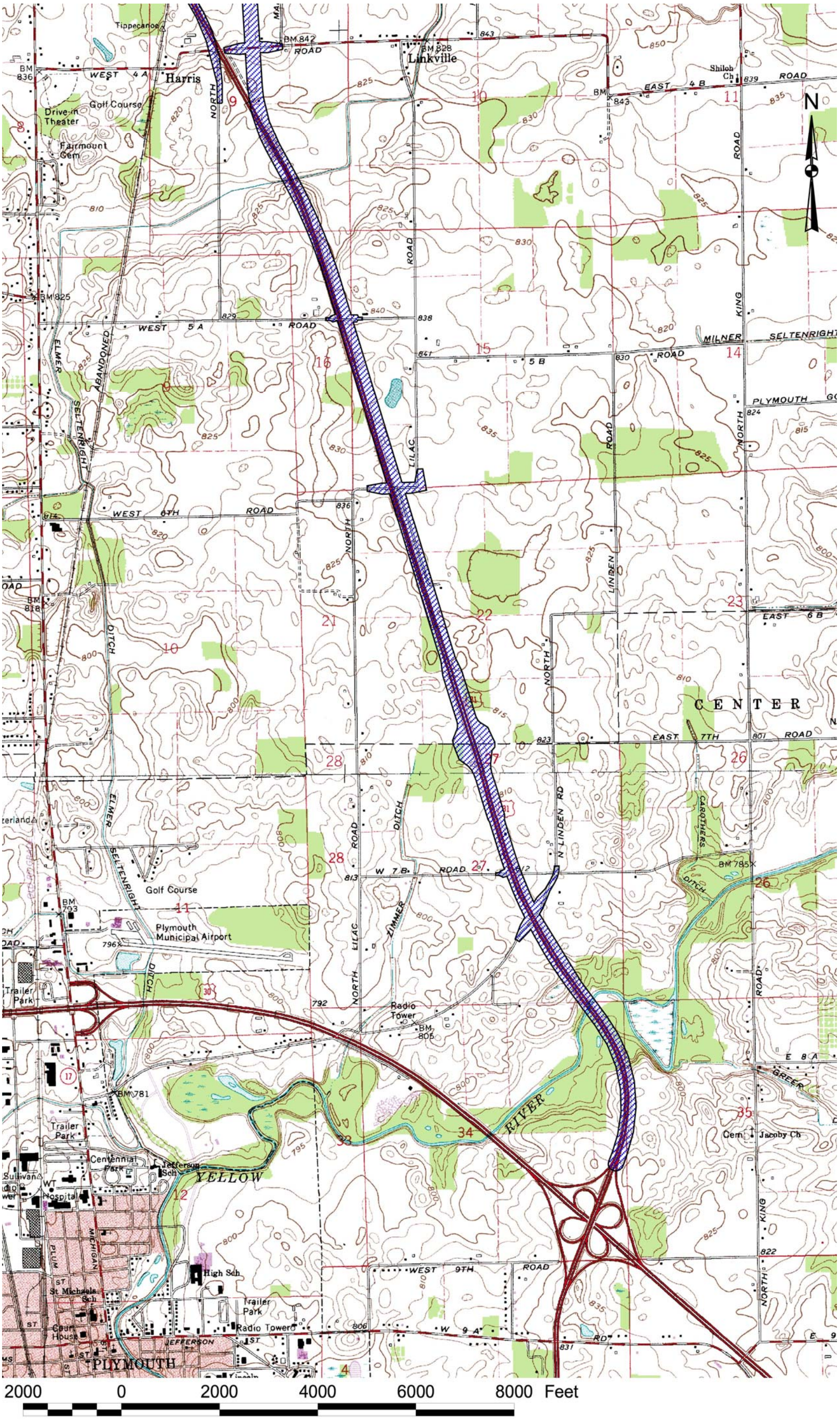

Figure 2. Project Area as shown on portions of the USGS 7.5 minute series Plymouth and La Paz, Indiana topographic quadrangles.

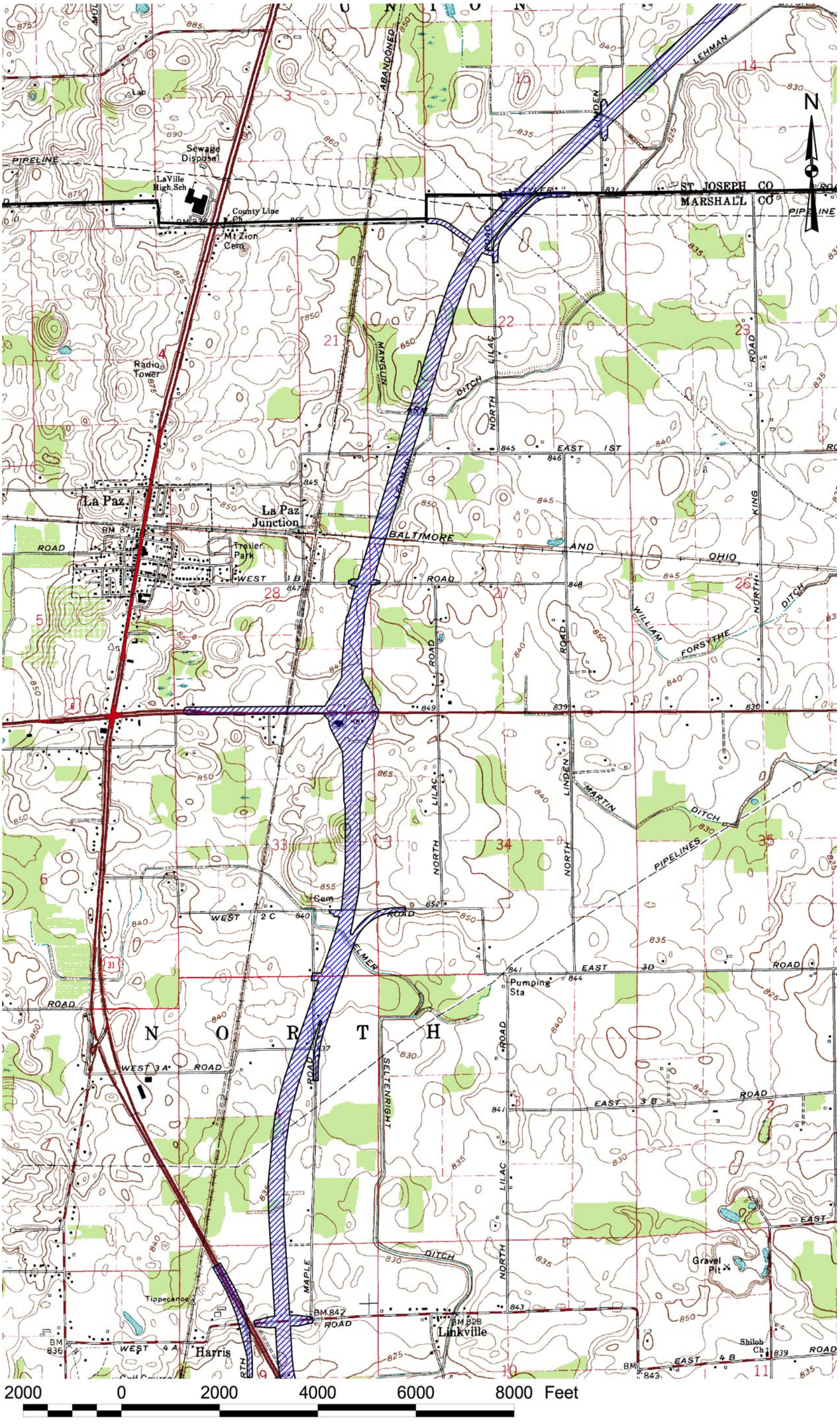

Figure 3. Project Area as shown on portions of the USGS 7.5 minute series La Paz, Indiana topographic quadrangle.

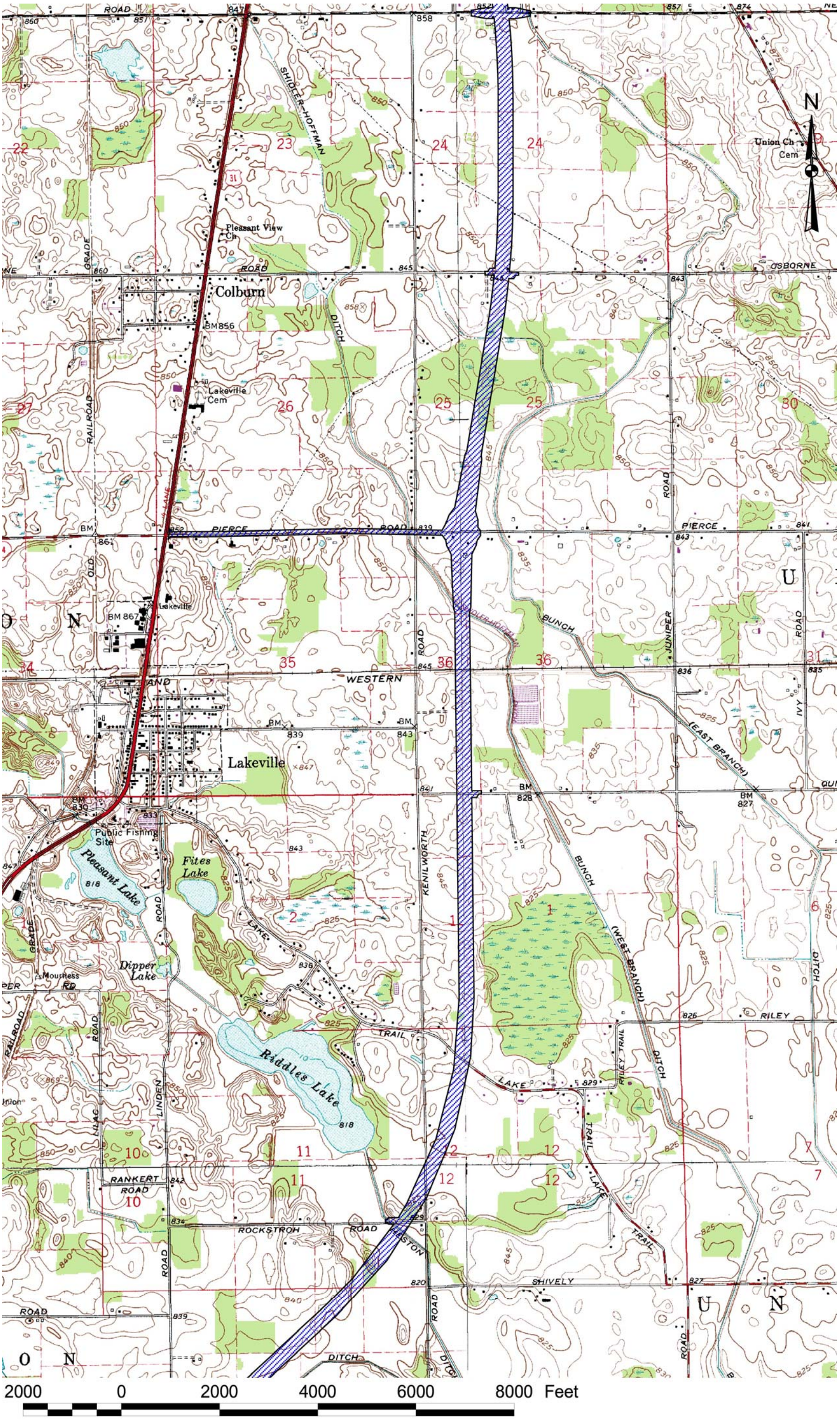

Figure 4. Project Area as shown on portions of the USGS 7.5 minute series La Paz, Bremen, Lakeville, and Wyatt, Indiana topographic quadrangles.

Figure 5. Project Area as shown on portions of the USGS 7.5 minute series Lakeville, Wyatt, South Bend West, and South Bend East, Indiana topographic quadrangles.

by the Erie Lobe. As a result, the area is now covered with a thick and complex deposit of glacial material, which exceeds 450 feet in places. The glacial topography is complex and characterized by knobs, kettles, kames, valley trains, and outwash plains. Natural community types are numerous and include bog, fen, marsh, prairie, sedge meadow, swamp, seep spring, lake, and various deciduous forest types. Bogs are more numerous here than in any other natural region within the state. In addition, swamp communities commonly border lake and bog sites, while areas of marsh are commonly associated with lake communities. The forest types consisted of oak-hickory and beech-maple (Homoya et al. 1985:252-253). Casebere (1997) states that the juxtaposition and blending of these numerous and variable natural communities created a great diversity of plant and animal life in this region.

The only major drainage that is traversed by the project area is the Yellow River drainage, which crosses the southern end of the project area just north of US 30.

Geology

North-central Indiana is a part of the Michigan Basin, underlain by Upper Devonian to Lower Mississippian-aged bedrock consisting of a nearly continuous sequence of brown, black, and green shales belonging to the Antrim, Ellsworth, and Sunbury Formations. These formations become thicker northward as they dip into the Michigan Basin and thin out to the south and southwest along the flank of the Kankakee Arch (Camp and Richardson 1999; Howe 1997). There are no natural exposures or outcrops of these rock formations in northern Indiana due to the thick covering of glacially derived material. However, Deutchman and Dorwin (1979) note that the glacial outwash deposits would have provided prehistoric inhabitants of the area with plentiful chert cobbles for the use in stone tool manufacturing. Cantin (1994) also notes that there are no known chert outcrops, or even chert-bearing formations, near the project area but believes that gravel cherts are often overlooked or underestimated as local sources of prehistoric lithic resources.

Soils

The Marshall and St. Joseph County soil surveys utilize somewhat different nomenclature and groupings of their soil associations and soil types, so each county's soils will be discussed individually.

There are four soil associations mapped within the Marshall County portion of the project area. These are the Oshtemo-Owosso-Fox association, the Crosier-Brookston association, the Riddles-Metea-Wawasee association, and the Houghton-Adrian-Palms association (Smallwood 1980).

1. *Oshtemo-Owosso-Fox Association* consists of deep and moderately deep, nearly level to strongly sloping, well drained, moderately coarse textured and coarse

textured soils found over sand and gravel and formed in outwash deposits. These soils are found on outwash plains and moraines.

2. *Crosier-Brookston Association* consists of deep, nearly level, somewhat poorly drained and very poorly drained, medium textured soils formed in glacial till. These soils are found on till plains and moraines.

3. *Riddles-Metea-Wawasee Association* consists of deep, nearly level to strongly sloping, well drained, moderately coarse textured and coarse textured soils that formed in glacial till. These soils are found on moraines.

4. *Houghton-Adrian-Palms Association* consists of deep, nearly level, very poorly drained soils that formed in organic material. These soils are found in bogs and on old lakebeds on till plains, outwash plains and moraines.

The specific soil types traversed by the Marshall County portion of the project area are listed below in Table 1, along with their corresponding drainage classification, landform on which they occur, and parent material in which they were formed.

Table 1. Soil types mapped with the Marshall County portion of the project area.

Symbol	**Soil Type**	**Drainage**	**Landform**	**Parent Material**
Ad	Adrian muck, drained	Very poor	Till plains and moraines	Organic material over sandy material
AuA	Aubbeenaubbee sandy loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
Bd	Brady sandy loam	Somewhat poor	Outwash plains	Outwash deposits
BoA	Bronson loamy sand, 0-2% slopes	Moderately well	Outwash plains	Outwash deposits
Br	Brookston loam	Very poor	Till plains and moraines	Glacial till
CtA	Crosier loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
Fc	Fluvaquents, loamy	Somewhat poor	Bottomlands	Alluvium
FsA	Fox sandy loam, 0-2% slopes	Well	Uplands	Outwash deposits
Gf	Gilford sandy loam	Very poor	Outwash plains	Sandy lacustrine and eolian deposits
Ho	Houghton muck, drained	Very poor	Till plains and moraines	Organic material

Symbol	Soil Type	Drainage	Landform	Parent Material
Hp	Houghton muck, ponded	Very poor	Moraines and outwash plains	Organic material
MeB	Martinsville loam, 2-6% slopes	Well	Terraces and outwash plains	Outwash deposits
MgB	Metea loamy fine sand, 2-6% slopes	Well	Moraines	Glacial till
Mn	Milford silty clay loam	Very poor	Broad flats, swales, and narrow drainageways in glacial lakebeds	Lacustrine deposits
OsA	Oshtemo loamy sand, 0-2% slopes	Well	Moraines and outwash plains	Outwash deposits
OsB	Oshtemo loamy sand, 2-6% slopes	Well	Moraines and outwash plains	Outwash deposits
OsC	Oshtemo loamy sand, 6-12% slopes	Well	Moraines and outwash plains	Outwash deposits
OwA	Owosso sandy loam, 0-2% slopes	Well	Uplands	Glacial till
Pa	Palms muck, drained	Very poor	Till plains and moraines	Organic material
PdA	Pinhook sandy loam, 0-2% slopes	Poor	Outwash plains	Outwash deposits
Re	Rensselaer loam	Very poor	Uplands	Outwash deposits
RsA	Riddles sandy loam, 0-2% slopes	Well	Moraines	Glacial till
RsB	Riddles sandy loam, 2-6% slopes	Well	Moraines	Glacial till
RsC2	Riddles sandy loam, 6-12% slopes, eroded	Well	Moraines	Glacial till
RsD	Riddles sandy loam, 12-18% slopes	Well	Moraines	Glacial till
TyB	Tyner loamy sand, 2-6% slopes	Well	Uplands	Sandy lacustrine and eolian deposits
Ua	Udorthents	N/A	Outwash plains and moraines	N/A
Wh	Washtenaw silt loam	Very poor	Moraines, till plains and outwash plains	Alluvium
WkC2	Wawasee sandy loam, 6-12% slopes, eroded	Well	Knolls and ridges on broad uplands	Glacial till

Symbol	Soil Type	Drainage	Landform	Parent Material
Wt	Whitaker loam	Somewhat poor	Terraces and outwash plains	Outwash deposits

There are four soil associations mapped within the St. Joseph County portion of the project area. These are the Crosier-Brookston-Milford association, the Hillsdale-Oshtemo association, the Houghton-Adrian-Palms association, and the Riddles-Miami-Crosier association (Benton 1977).

1. *Crosier-Brookston-Milford Association* consists of deep, depressional and nearly level to gently sloping, and somewhat poorly drained to very poorly drained soils found on till plains and lake plains.

2. *Hillsdale-Oshtemo-Chelsea Association* consists of deep, nearly level to strongly sloping, and well-drained to excessively drained soils found on till plains, moraines, outwash plains, and terraces.

3. *Houghton-Adrian-Palms Association* soils consists of deep, depressional and nearly level, and very poorly drained organic soils found on lake plains, outwash plains, and till plains.

4. *Riddles-Miami-Crosier Association* soils are deep, nearly level to strongly sloping, and well-drained to somewhat poorly drained soils found on till plains.

The specific soil types traversed by the St. Joseph County portion of the project area are listed below in Table 2; along with their corresponding drainage classification, landform on which they occur, and parent material in which they were formed.

Table 2. Soil types mapped with the St. Joseph County portion of the project area.

Symbol	Soil Type	Drainage	Landform	Parent Material
Ad	Adrian muck, drained	Very poor	Till plains and moraines	Organic material over sandy material
Am	Alluvial land	Somewhat poor	Bottomlands	Alluvium
Au	Aubbeenaubbee sandy loam	Somewhat poor	Uplands	Glacial till
Bd	Brady sandy loam	Somewhat poor	Terraces and outwash plains	Outwash deposits
BeA	Brems fine sand, 0-2% slope	Moderately well	Outwash plains	Eolian sand deposits
Br	Brookston silty clay loam	Very poor	Till plains	Glacial till
ChA	Chelsea fine sand, 0-5% slopes	Excessive	Outwash plains	Eolian sand deposits

Symbol	Soil Type	Drainage	Landform	Parent Material
ChC	Chelsea fine sand, 5-10% slopes	Excessive	Outwash plains	Eolian sand deposits
CtA	Crosier loam, 0-2% slopes	Somewhat poor	Uplands	Glacial till
De	Del Rey silt loam	Somewhat poor	Lacustrine plains	Lacustrine deposits
GP	Gravel Pits	N/A	Disturbed	N/A
HdA	Hillsdale sandy loam, 0-2% slopes	Well	Till plains and moraines	Glacial till
HeC2	Hillsdale complex, 6-12% slopes, eroded	Well	Till plains and moraines	Glacial till
HeD2	Hillsdale complex, 12-18% slopes,	Well	Till plains and moraines	Glacial till
Hm	Houghton muck	Very poor	Till plains and moraines	Organic material
Ho	Houghton muck, drained	Very poor	Till plains and moraines	Organic material
La	Landes loam	Moderately well	Bottomlands	Alluvium
Mc	Marsh	Very poor	Moraines and outwash plains	Organic material
MeA	Martinsville loam, 0-2% slopes	Well	Terraces and outwash plains	Outwash deposits
MeB2	Martinsville loam, 2-6% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
MeC2	Martinsville loam, 6-12% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
MkB	Metea loamy fine sand, 4-10% slopes	Well	Till plains	Glacial till
MoC3	Miami clay loam, 6-12% slopes, severely eroded	Well	Till plains	Glacial till
MoD3	Miami clay loam, 12-18% slopes, severely eroded	Well	Till plains	Glacial till
Mp	Milford silty clay loam	Poor	Glacial lake plains	Lacustrine deposits
OsA	Oshtemo sandy loam, 0-2% slopes	Well	Terraces and outwash plains	Outwash deposits
OsB	Oshtemo sandy loam, 2-6% slopes	Well	Terraces and outwash plains	Outwash deposits

Symbol	Soil Type	Drainage	Landform	Parent Material
OsC2	Oshtemo sandy loam, 6-12% slopes, eroded	Well	Terraces and outwash plains	Outwash deposits
OsD	Oshtemo sandy loam, 12-18% slopes	Well	Terraces and outwash plains	Outwash deposits
Pa	Palms muck, drained	Very poor	Till plains	Organic material
Re	Rensselaer loam	Very poor	Outwash plains	Outwash deposits
Rm	Rensselaer mucky loam	Very poor	Outwash plains	Outwash deposits
RtA	Riddles loam, 0-2 % slopes	Well	Till plains	Glacial till
RtB	Riddles loam, 2-6 % slopes	Well	Till plains	Glacial till
RtC2	Riddles loam, 6-12 % slopes, eroded	Well	Till plains	Glacial till
RtD2	Riddles loam, 12-18 % slopes, eroded	Well	Till plains	Glacial till
Tx	Troxel silt loam	Well	Outwash plains	Outwash deposits
TyD	Tyner loamy sand, 12-18% slopes	Well	Terraces and outwash plains	Sandy outwash deposits
Wk	Wallkill silt loam	Very poor	Till plains and lake plains	Organic material
Ws	Washtenaw silt loam	Very poor	Moraines, till plains and outwash plains	Alluvium
Wt	Whitaker loam	Somewhat poor	Outwash plains	Outwash deposits

Climate

Although there have been minor fluctuations, with periods of warming and cooling (Newman 1997), the current climatic conditions in Indiana have existed for approximately the past 5000 years (Melhorn 1997; Newman 1997; Stafford 1997). However, during the Pleistocene the climate was much colder, with glaciers covering large portions of the state. In northern Indiana, the glacial ice lingered longer than in the rest of the state (Melhorn 1997), with the spruce dominated forests characteristic of the glacial regime being gradually replaced by the deciduous forests (Stafford 1997).

The current climate of north-central Indiana is classified as cool, temperate-continental, and humid (Newman 1997), modified locally by Lake Michigan (Benton 1977; Smallwood 1980). In Marshall County the summers are often hot, while the winters are relatively cold. St. Joseph County has less temperature extremes than Marshall County due to increased cloud cover because of its proximity downwind of Lake Michigan, (Benton 1977; Smallwood 1980). The area is not as prone to summer droughts

as is the remainder of Indiana due to increased ground moisture from winter snow cover. The average annual growing season for these counties is the shortest in Indiana ranging from 150 to 170 days per year (Newman 1997). Average annual snowfall is 30 to 40 inches or more per year, which again is greatly affected by Lake Michigan (Newman 1997). Average yearly precipitation is approximately 37 inches for Marshall County and approximately 36 inches for St. Joseph County (Benton 1977; Smallwood 1980).

Flora and Fauna

The presettlement vegetation of north-central Indiana consisted primarily of Oak-Hickory forests on the sandy higher ground combined with large areas of both a Beech-Maple forests and wetlands in the lowlands (Lindsey 1997). The blending of natural community types within this region resulted in a great diversity of plant and animal life (Casebere 1997). Dry and dry-mesic upland forest types, which once covered approximately half of the region, dominate the Oak-Hickory association. This natural community is characterized by such species as red oak, white oak, black oak, shagbark hickory, and pignut hickory. The mesic areas of the Beech-Maple association are characterized by such dominant species as beech, sugar maple, black maple, and tulip tree. Natural community types of lake, swamp, marsh, and bog, each of which has many distinctive species, a few of which are state restricted, characterize the Wetlands association. These restricted species include ginger-leaved pyrola, needle-and-thread grass, knotted spikerush, autumn willow, and Deam's rockcress (Casebere 1997; Homoya et al.1985; Lindsey 1997).

Mumford (1966, 1997) notes there are 57 species of wild mammals occurring in Indiana. The more commonly observed species include white-tailed deer, opossum, gray squirrel, red squirrel, fox squirrel, eastern chipmunk, eastern cottontail rabbit, raccoon, woodchuck, and striped skunk. Other, not as readily seen, species include several varieties of bat, shrew, and vole, as well as beaver, mink, and coyote (Mumford 1966). As with the flora, north-central Indiana's Northern Lakes Natural Region is home to distinctive fauna including the spotted turtle, massasaugua rattlesnake, Blanding's turtle, star-nosed mole, cisco, marsh wren, swamp sparrow, and sandhill crane (Casebere 1997; Homoya et al.1985:252-253). Many aquatic species of mammals, turtles, and fish are prevalent in this region and waterfowl, such as ducks and geese, are also extremely abundant especially during migrations (Casebere 1997). Bison and black bear were also present in north-central Indiana, but were gone by the mid 1800s (Richards and Whitaker 1997). Many species of megafauna existed in the region during the Pleistocene. These included the mastodon, mammoth, giant beaver, giant ground sloth, saber-tooth tiger, dire wolf, musk ox, various species of peccary, the ancient bison, short-faced bear, stag moose, tapir, giant armadillo, jaguar, and horse. However, all of these species were extinct in Indiana by 10,000 B.C. (Richards and Whitaker 1997).

CULTURAL OVERVIEW

Paleo-Indian (prior to 8000 B.C.)

Aboriginal big game hunters from Asia are thought to have entered into the New World in boats following the coast, or by land across the Bering Strait during the middle or the end of the last continental glaciation. The great continental glaciers locked up so much of the earth's water that the sea level was lowered, exposing the continental shelf, and creating a land bridge linking the two continents. Migration of Early Paleo-Indians into the contiguous United States likely occurred sometime during one of three stades of the Pinedale glacial episode. Stalker (1980) believes "there is sufficient evidence to indicate that man entered the New World before the beginning of the Classical Wisconsin, thus largely negating the need for an ice free corridor (west of the Rocky Mountain Belt)... However, if an ice free corridor is desired for the original southward migration... there are two age possibilities: First... perhaps 19,000 or 20,000 years ago and, and secondly, after about 14,000 years ago during the final retreat of the continental glacier from the region." Knight (1989) believes the evidence seems to weigh against the later date because archaeological sites approaching 13,000 years old are widespread in both North and South America, a fact that cannot be easily explained by initial migrations post-dating 12,000 B.C. In Indiana the glaciers had retreated north of the Great Lakes basin by about 10,000 B.C., the date of the Glenwood dune ridge. The boreal spruce forest was "replaced by a mixed conifer-deciduous woodland with occasional areas of open, often marshy ground occupied by giant beaver, elk, sloth, and mastodon" (Hicks 1992:5).

Tankersley (1992) notes that early Paleo-Indians are known in Indiana from ca. 9200 - 8800 B.C. These nomadic hunters spread rapidly into the rich new continent, perhaps entering Indiana from the west, up the Ohio River and the Wabash, likely following the herds of animals that once migrated each fall from the vast Illinois Prairie summer grazing lands to the salt and mineral licks in the protected forested river valley of Southern Illinois, Indiana, Kentucky, and Tennessee. Smith (1990) noted a correlation between Paleo-Indian sites and historic game trails such as the Buffalo Trace, which ran between the Falls of the Ohio and Vincennes on the Wabash River. Although bison are a historic phenomenon dating from about A.D. 1450, there is no reason not to assume that the route these large mammals followed was a traditional game trail used by earlier large mammals for similar reasons.

The evidence for Paleo-Indian peoples in eastern North America includes several types of lanceolate fluted and unfluted points as well as a diverse assemblage of chipped stone tools (Griffin 1967; Justice 1987). During late glacial and early post-glacial times these tools were used to exploit large game such as caribou, musk oxen, mammoth, and mastodon as well as scarce edible plants. Paleo-Indian sites are often small, have low artifact densities, and no evidence for permanent structures implying high mobility and band-level social organization (Stoltman and Baerreis 1983). During later Paleo-Indian times the subsistence base began to shift from a focus on large game towards broader

based hunting and collecting. This trend was probably accompanied by greater territorial restriction and increasingly stable regional adaptations (Hicks 1992; Stoltman and Baerreis 1983).

The most culturally diagnostic tool that was produced by the Paleo-Indians was the fluted projectile point. "Fluted projectile points typologically referred to as Clovis represent the oldest unequivocal cultural manifestations identified in Indiana. A large suite of radiocarbon assays demonstrates that Clovis projectile points were manufactured between 11,200 and 10,800 b.p. Divergence in this artifact style occurred ca. 10,800 b.p. in both the southwestern and northeastern states (Haynes et al. 1984; Munson 1990)" (Tankersley 1992:12). In the West, Clovis points have been found in association with the remains of mammoths.

According to Tankersley (1992:9) the "greatest concentrations of fluted points occur on terrace and floodplain settings (72 percent, n=288) and overlooks (22 percent, n=88) of those areas, a phenomenon that can be related in part to the monitoring, procurement, and processing of game... Particular 'environmental magnets' for hunting and habitation sites would have been wetlands: marshy areas, the confluences of major streams, shallow river crossings, sinkhole ponds, kettle lakes, and springs (especially saline and sulfur springs)." Six fluted projectile points are shown as having been found in Marshall County and only one in St. Joseph County (Tankersley 1992:9).

The Alton Site (12-Pe-171) along the banks of the Ohio in Perry County is "the largest, most productive Paleo-Indian site known in Indiana" from which "over 50 points and a substantial number and variety of unifacial tools" have been recovered (Tomak 1994a). A Paleo-Indian point was discovered during an INDOT survey of the US 30 Plymouth bypass improvements just west of the southern terminus of this project (Curtis Tomak, personal communication).

Early Archaic (8000 - 6000 B.C.)

An abrupt change in atmosphere circulation patterns ca. 8030 - 7300 B.C. resulted in rapid replacement of the spruce forest present since the retreat of the great ice sheets by pine forests in the Great Lakes area based upon pollen spectra. Further west, spruce forests were replaced by grasslands (Bryson et al 1970). The continued melting and shrinking of the Laurentide continental ice sheet opened an ice-free corridor fully to the Arctic between ca 7300 - 6490 B.C. allowing cold Arctic surface air to penetrate the lower plains and midsection of the continent with increasing frequency and intensity. Summers were warmer, winters colder, and a dominant winter-spring storm pattern with strong westerlies, dry air and a drier climate was established. The grasslands expanded toward the northwest and east (Hoffman and Jones 1970, Wendland 1978). In the Great Plains the change was from good-browsing, tall grass prairie to short grass, providing "the coupe de grace for the large browsers" such as the mammoth and giant bison (Bryson et al 1970). In Indiana "a strong warming trend…allowed the reemergence of deciduous forest" (Hicks 1992) with oak hickory associations found on the upland, and beech maple

associations in wetter areas and bottoms. Reeves (1969) notes floodplains were stable with minor alluvial cycles.

The hunting and foraging people of later Paleo-Indian and Early Archaic times slowly adjusted to the extinction of large game brought on by the changing landscapes of an increasingly warmer and drier climate. The distinction implied by the term Early Archaic is thus a blurred one, marking a time of transition from specialized big game hunting towards a more regionally focused subsistence based on deer and small game hunting, fishing, and the limited collection of freshwater mollusks and plants (Hicks 1992; Stoltman 1978). "The Early Archaic was a period of increasing regional specialization, with settlement patterns structured around the seasonal availability of various resources in different environmental zones... Early Archaic populations... generally followed a 'central-based wandering' foraging scheme... with centralized base camps in strategic locations, which served as axes for numerous smaller hunting and gathering camps... The central base camps would probably have been established on better drained soils in environmental settings that would allow hunting and gathering parties to draw on a variety of seasonally available resources with a minimum of effort" (Mohow 1992:15-22). An increase in the number of sites encountered suggests population growth or aggregation as well as an increasingly diversified subsistence/settlement system (Mohow 1992). Though few Early Archaic burial sites have been reported, the Jerger site and Steele sites in Daviess County provide evidence of mortuary ceremonialism including cremation, use of red ochre, burned artifacts, and the presence of "exotics" including marine shell beads (Tomak 1991). Early Archaic tool assemblages indicate continued primary emphasis on hunting and animal processing (Griffin 1983:244), though the gathering of newly available plants and aquatic resources undoubtedly increased during this time. Diagnostics of the Early Archaic in Indiana include points of the Thebes, Large Side Notched, Kirk Corner Notched, Kirk Stemmed, Rice Lobed, and LeCroy clusters (Justice 1987).

Middle Archaic (6000 - 3000 B.C.)

Between 6490 -3060 B.C. the Laurentide continental glacier continued to retract, and although the southward flow of Arctic and Canadian air continued it was less frequent than it is today (Wendland 1978). Westerlies continued to warm and dry the midsection of the continent, causing the grasslands to expand to their greatest Holocene limits both north and east by about 5000 B.C. (Bryson et al 1970). Expansion of the Illinois prairie grasslands into parts of northern Indiana reached their maximum during this time. "In some portions of eastern and northern Indiana especially in the northeast, the outcome appears to have been savanna dotted with stands of oak" (Williams 1974). Reeves (1969) notes this to be a time of low stream flow and an erosional interval. Vreeken (1975) notes valley entrenchment ceased in Iowa by about 5000 B.C., when "the floodplain stabilized, and a soil formed; rapid infilling, as a result of sheet erosion on the slopes began a little after 4200 B.C."

During the Middle Archaic period people of the Midwest adapted to a time of maximum warmth and dryness that was accompanied by the spread of grasslands and oak-hickory forests. The drier climate drew native populations to the river valleys and ecotones between prairie and forests where the food sources remained plentiful. In Indiana, resource utilization of the uplands appears to have almost ceased during this period. The concentration of populations caused by the more stressful environmental conditions initially resulted in social fragmentation; however, gradually this fragmentation was replaced by increased cooperation in order to maintain subsistence within the finite resource base. This in turn probably fostered population growth and logistically organized collector strategies (Brown and Vierra 1983; Stafford 1994). The increased group cooperation, and a more sedentary lifestyle, provided a more stable environment for the introduction of cultivates to supplement the game and wild plant utilization during the Late Archaic. True plant cultivation was already present on the continent by 6500 B.C., in the high valley of Tehuacan in Mexico, where cotton, chili peppers, pumpkin squash, and by about 3500 B.C. beans and maize were being cultivated by similar hunters and gatherers.

An increase in the presence of rough and ground stone tools, such as grinding stones, mortars and pestles, bannerstones, and grooved axes, seems to indicate a time of increased subsistence diversity (Griffin 1967). However, deer, hickory nuts, and at some locations aquatic resources still probably dominated the diet (Stafford 1994). High quantities of fire-cracked or fire-burned rock at Middle Archaic base camps suggests intensive food processing, probably for the extraction of hickory nutmeats and oil (Stafford 1994). The Middle Archaic horizons from the Koster site in the lower Illinois Valley contain chipped, rough and ground stone tools, diverse antler and bone tools, hearths, roasting pits, mussel steaming pits, shell dumps, shallow storage pits and evidence for rectangular structures (Brown and Vierra 1983).

A breakdown in the trade of high quality cryptocrystaline cherts apparently occurred during the Middle Archaic, as more local, often poor quality cherts were utilized. The diversity of point styles during the Middle Archaic, most spatially limited, is thought to reflect territoriality and possibly even ethnic boundaries (Sieber et al. 1989). The climate, and the populations within the moist deciduous woodland interior core of Tennessee, Kentucky, and northern Georgia remain relatively stable, based upon point style distributions, but fragmentation seems to occur in outlying areas, including most of Indiana north of the Ohio Valley. Diagnostics of the Middle Archaic include points of the Large Side Notched, Stanley Stemmed, Eva, and Morrow Mountain clusters (Justice 1987). Points from the Matanzas and Karnak clusters, both of which have origins on the Illinois prairie, also occur during the Middle Archaic period and last well in the Late Archaic (Justice 1987; Stafford 1994).

Late Archaic (3000 - 700 B.C.)

Between ca. 3060 and 760 B.C. the northern Arctic continental air shifted south, cooling the midsection of North America causing the northern boreal forest to migrate

south and the grasslands to retreat westward to about their present limits (Knight 1989). Asch et al. (1972) believe the vegetation at Koster in the Lower Illinois Valley has been stable since this time. But Butzer (1977) points out that plant remains from the site are cultural, gathered from a large area, and can not be considered diagnostic of vegetational change on the adjacent floodplain where braided streams in the Early and Middle Archaic times provided sandy, free draining substrates, historically favored by floodplain prairie rather than deep basins with floodplains forest. Terrain appears to have affected changes in flora and fauna more than climate except in ectones. Between about 3000 B.C. and 2000 B.C., a change from warm and dry to slightly cooler and moister conditions occurred. Pollen analysis at Koster shows a gradual shift to moist forest (Schoenwetter 1979). Lake Michigan rose rapidly between 3500 and 2500 B.C., but then dropped after 1000 B.C. (Larsen 1974).

A more sedentary lifestyle concentrated along the major drainages, lakes, and marshes, which began by necessity during the Middle Archaic, continued through the Late Archaic. In the Midwest this period is widely known as one of increasing complexity and diversity and as a time of transition between established Archaic patterns and new Woodland patterns featuring ceramics, food production, and mound building (Griffin 1983; Stoltman 1978). Larger sites with recurrent habitations suggest considerable population growth (Griffin 1983:249), which may be linked to the gradual return of cooler and wetter conditions and the spread of modern mixed-deciduous forests. Other general trends include increasing use of plant foods, increasing numbers of grinding stones, a greater variety of preserved faunal remains, evidence for structures, the appearance of shell midden sites, long distance exchange of raw materials and finished objects, and inclusion of exchange objects in burials (Griffin 1967, 1983; Kellar 1983). Ellis et al. (1989) note that, “Late Archaic material culture includes a proliferation of woodworking implements (axes, adzes, and the appearance of the celt); greater quantities and variety of food processing implements such as mortars, pestles, manos, nutting stones; and elaborate bone and antler food industry (awls, fish hooks, batons, net-making items, flutes, etc...); ornaments (pearl, copper, shell beads, pendants, gorgets, hairpins); and projectile points such as Matanzas, Brewerton, Karnak, McWhinney, and a variety of stemmed points.” Early fiber-tempered ceramics appear in the Southeast by about 2000 B.C. (Griffin 1967), but ceramics do not appear in the Midwest until the end of the Late Archaic (Griffin 1983). Evidence for the cultivation of native plants as well as squash and gourd imports from the southeast is also indicated at the end of the Late Archaic (Ford 1974:401).

In southern Indiana, the Late Archaic is characterized by shell middens, and is tied to a much larger shell midden, Mid-continent Archaic Tradition extending throughout the southeastern woodlands interior. Animal remains mentioned by Miller (1941) at the McCain site, a Middle to Late Archaic shell midden in Dubois County, include elk, Virginia deer, raccoon, fox and gray squirrels, woodchuck, prairie mole, turkeys, ducks, herons, cranes, fish, box turtles, both freshwater and land gastropods, and in greatest quantity, freshwater mussels such as warty-back or pimple-back, maple-leaf, black-sand shell or Long John, and mucket. Plant remains identified by Miller from the site included

“the shells of acorns, hickory nuts, black walnuts, and butternuts -- generally broken and charred”.

There are a number of named regional Late Archaic manifestations throughout the Midwest. One of the best known is the Helton phase, which is known from the Koster Site in the lower Illinois Valley. Helton phase artifacts include points from the Matanzas, Late Archaic Stemmed, and Table Rock clusters, T-shaped drills, full and three-quarter grooved axes, plummets, bannerstones, metates, and chevron-incised bone pins. A variety of hearths and roasting pits are found at Helton phase sites along with evidence for a rectangular house pattern. Some differences in burial treatment suggest the marking of status and in some cases Helton phase burials contain exotic materials such as marine shell or copper (Griffin 1983:250; Brown and Vierra 1983:185; Munson and Cook 1980:734-736). By 2000 B.C. the Helton phase is replaced at Koster by the Titterington phase, which is defined by points from the Nebo Hill, Etley and Wadlow clusters (Sedalia, Etley and Wadlow points) (Brown and Vierra 1983:186). Titterington people are cited as having a well-adjusted economy that made equal use of floodplains, uplands, and areas in between (Griffin 1983:250).

In south-central and southwestern Indiana, Munson and Cook (1980) have defined the French Lick phase (3000 - 1500 B.C.). This phase incorporates riverine shell midden and non-shell midden sites with points from the Matanzas and Late Archaic Stemmed clusters. The French Lick subsistence/settlement system is characterized by summer and fall base camps along large creeks and tributary confluences, fall and winter camps along tributaries, and summer shell midden sites along large rivers (Munson and Cook 1980:723-730).

Riverton Culture sites (2000-1000 B.C.) have been identified along the middle Wabash River by Winters (1969). Riverton sites range from shell middens along the river to terrace top settlements with houses and prepared clay floors (Winters 1969:137). Robeson Constricted Stem, Merom Expanding Stem, and Trimble Side Notched points are diagnostic of the Riverton Culture along with the occurrence of Robeson gouges, grooved sinkers, limonite axes, “cloudblower” pipes, and Indian Knoll rattles. Recent excavations in Greendale, Dearborn County, Indiana on a high terrace overlooking the Great Miami River have revealed human remains associated with Riverton points. Ford (1974:395) includes the various Late Archaic manifestations discussed here in a larger mid-continent tradition called the Riverine Archaic.

While the Riverine tradition clearly defines southern portions of Indiana, the Late Archaic in the northern half of the state is not as well understood. A complex known as Glacial Kame is known from burials in gravel mounds with distinctive marine shell, gorgets, and native copper grave goods. Red ochre and “birdstones” were often included as well (Griffin 1983:253; Kellar 1983:34). In the western portion of the state a related mortuary complex known as Red Ocher is defined by red ocher-covered burials in low artificial mounds. Distinctive Fulton Turkey-tail points are associated with Red Ocher manifestations, often occurring in large caches (Kellar 1983:34). These burial complexes

appear ancestral to the burial ceremonialism that became so widespread during Early and Middle Woodland times.

Early Woodland (700 - 100 B.C.)

Between 760 B.C. and A.D. 320 climatic deterioration, particularly north of 40 degrees latitude (Wendland 1978), and alluviation of streams is recorded (Reeves 1969) indicating the increased rainfall that began in the Late Archaic continues. Lake Michigan water levels reached new highs by 400 B.C., and then fell sharply, followed by a new rise about A.D. 500 (Larsen 1974).

Early Woodland peoples constructed earthen mounds for the dead throughout many parts of eastern North America. The most extensive form of this practice by Adena peoples took place in the Ohio Valley area (Griffin 1983:254). Cremation and inhumation burials have been found in village cemeteries and in accretional mounds built over the locations of circular "ritual" structures (Griffin 1983:258; Clay 1986:581). The distribution of Adena mortuary goods among adult males suggests the presence of graded, achieved statuses (Mainfort 1989:173). Mortuary goods include cut mica, copper bracelets, copper beads, copper adzes, tubular pipes, effigy pipes, marine shell, engraved stone tablets, and plain and decorated ceramics (Griffin 1983:258-259). Small domestic sites with strategic locations between valleys and uplands, characterize other Early Woodland complexes such as Black Sand in western Illinois (Griffin 1983:257).

Pottery marks the transition from the Late Archaic to the Early Woodland Period. Pottery in the New World first appears in Ecuador about 3000 B.C., "bearing an astonishing resemblance to potteries of the same date from the island of Kyusu, Japan" (Campbell 1988). It is found along the Caribbean coast at Porto Hormiga, Columbia, and the Tehuacan Valley of Mexico by 2300 B.C. The skills of pottery making apparently may have entered into North America by sea from coastal Columbia across the Antilles Islands, for pottery is found in shell heaps on the Georgia coast near Savannah, and near the St. Johns River in northeastern Florida by 1900 B.C. Pottery has been radiocarbon dated from Mobile Bay in Alabama at 1090 B.C., plus or minus 200 years, and is reported from the Koster Site in western Illinois by about 1800 B.C. In the Midwest, a thick pottery, fabric impressed from baskets, known as Marion Thick first appears in the Midwest late in the Red Ochre burial complex.

Throughout the Early Woodland period people were still dependent on hunting and seasonal gathering for the bulk of their food. However, intensive hunting and gathering appears to have been supplemented to a small degree by the cultivation of squash and gourd and the indigenous cultigens sunflower, sumpweed, and goosefoot (Stoltman 1978; Ford 1974). In southern Indiana the occupation of shell midden sites continued into the Early Woodland period, as shown by the presence of Marion Thick pottery and Adena stemmed points at these sites. However, the dependence on mussels as a food source during this time period was steadily declining.

The population increases of the Late Archaic continued through the Early Woodland, culminating in a scatter of small villages, or hamlets along the rivers linked within walking distance to larger central gathering places where burial mounds, religious and social ceremonies, and it is presumed, trade took place. Burial mounds, are first evidenced in the Terminal Late Archaic/Early Woodland Red Ochre complex. Their construction is suggested by Clay (1991) as accretional rather than a part of some broad planned public works program such as occurred with the canal systems of South and Middle America, and the later ceremonial earthworks of Hopewell and the Mississippian. Just as in Europe, where devout travelers gave offerings and prayers at a shrine of a patron saint for a safe journey, so perhaps did Woodland people add a basket of earth to the grave of a great leader or warrior. Therefore, according to Clay (1991) the size of the mound was not planned, but was a reflection of the size of the surrounding population, and the length of time the homage continued.

Eventually, as the construction of these mounds continued and the associated burial practices became more elaborate, the Adena burial mound complex developed. Seeman (1986) defines Adena as "that rather amorphous Early Woodland cultural manifestation in the Ohio Valley dating between 500 B.C. and A.D. 1 and identified with burial mound construction, elaborate mortuary ceremony, and such specific artifact classes as tubular pipes, various gorget forms, Adena ovate-based points, hematite celts, copper bracelets, and Adena Plain, Fayette Thick, and Montgomery Incised ceramics". At a number of Adena sites cremation and inhumation burials have been found in village cemeteries and in accretional mounds built over the locations of circular "ritual" structures (Griffin 1983; Clay 1986). In addition, the distribution of Adena mortuary goods among adult males suggests the presence of graded, achieved statuses (Mainfort 1989). Adena Stemmed points from the Dickson Cluster are diagnostic of Adena (Justice 1987). According to Kellar (1983) it is likely that Adena communities were small and scattered throughout the countryside. However, the "inhabitants of several of the communities probably maintained a special social relationship and co-operated in the construction of the mounds and shared in the attendant ritualism" (Kellar 1983:38). One of the best-known Adena burial mounds in Indiana is the Nowlin Mound site located in southeastern corner of the State. This mound enclosed seven log tombs containing seven extended and four reburials along with *Marginella* beads, corner and side-notched projectile points, bone handles, bone awls, and a C-shaped copper bracelet (Kellar 1983).

Early Woodland point types extending from the Late Archaic listed in Justice (1987) include: Delhi points found from the Louisiana coast up the Mississippi valley and up the Ohio valley to West Virginia; Gary Contracting stemmed points found over a similar geographical spread and part of the Dickson Cluster with affinities to Adena stemmed points; the Motley point with a similar distribution as above, first identified at Poverty Point in Louisiana, (made of cherts from Tennessee, Oklahoma and the Ohio Valley); Wade points found along the Ohio Valley, extending through Kentucky and Tennessee to northern Georgia and Alabama; Buck Creek Barbed points found along the Ohio Valley in Kentucky, Illinois, Indiana and Ohio; the Turkey-tail Cluster, a ceremonial point style found throughout the Midwest; and Saratoga Cluster points found along the

lower Ohio Valley and in southern Illinois, Indiana, and most of Kentucky and Tennessee.

Point types first appearing during the Early Woodland listed in Justice (1987) include: the Kramer stemmed point extending from the Ohio Valley northward to the Great Lakes and found in association with Marion Thick pottery; the Cressap Stemmed point, diagnostic of Early Adena and extending from southeastern Indiana and northern Kentucky up the Ohio into the Northeast and the Atlantic coast; the Robbins point (diagnostic of Middle Adena) with the same distribution as the Early Adena Cressap Stemmed, but extending further down river into eastern Illinois; Dickson contracting stemmed points centering in the Illinois and Kaskaskia Valleys encompassing all of Illinois, but extending up the Ohio Valley in southwestern Indiana, Kentucky, into southern Wisconsin, portions of Iowa, Missouri, and northeast Oklahoma; and Adena Stemmed points encompassing the eastern interior woodlands south to Florida, north into the Great Lakes, and the Northeast to the New York coast.

At a limited number of terrace and floodplain habitation sites throughout Indiana, Early Woodland Marion Thick ceramics occur in association with pits and thick midden deposits. In a similar setting, ceramics of Middle Woodland age are associated with living floors and hearths (Kellar 1983:36, 43; Hicks 1992:25). Crab Orchard Tradition Hopewell burial mounds are situated on high terraces and bluffs in southwestern Indiana, and a village/ceremonial complex has been identified in Posey County (Kellar 1983:45-46). Mounds and earth enclosures in east-central Indiana were constructed from late Adena through Hopewell times (Cochran 1992:26). Diagnostic artifact types for Adena sites in Indiana include Montgomery Incised ceramics, copper bracelets, and Adena points and cache blades. Hopewell diagnostics include various types of stamped ceramics, copper earspools, stone effigy pipes, Hopewell Cache blades, Snyders points, and Lowe Flared Base points (Kellar 1983:41-45).

Middle Woodland (100 B.C. - A.D. 500)

After approximately 100 B.C. Middle Woodland Hopewellian regional complexes dominated the Midwest. In fact “Middle Woodland is defined on the basis of the expansion of the Hopewell ceremonial complex... The earliest evidence of Hopewell ceremonialism is in the Havana Tradition in northern Illinois, its apparent origin... The key indicator of this complex is the finely crafted ceremonial pottery. Its most distinctive feature is a thickened rim decorated by cross-hatching, bordered with punctates... Texturing techniques include (rocker and dentate) stamping, incising, trailing, brushing, cord impressing, and cord marking. Painted decoration also occurs. Temper is fine to medium grit, often limestone... the raptorial bird motif is common in Havana Hopewell… [However,] Hopewell pottery does not replace the various widespread pre-existing utilitarian Woodland wares… including Havana pottery, the prototype for all Hopewell wares.” (Swartz, Jr. 1981). Havana Hopewell includes mortuary goods that are similar to and burial mound that are smaller than the later Ohio Hopewell, however, no geometric earthworks are present (Griffin 1983:268).

More complicated indigenous ceramics with rocker and dentate stamped decoration appeared during the Middle Woodland along with trade vessels from the southeast (Griffin 1967:184; Griffin 1983:254). Intensive hunting and gathering appears to have been supplemented by cultivation of squash and gourd and the indigenous cultigens sunflower, sumpweed, and goosefoot (Stoltman 1978:718; Ford 1974:401). Corn was adopted from the southwest much later, and became a regular (though not staple) part of Middle Woodland subsistence (Ford 1974:402).

Thin flaked lamellar blade knives, struck from a prepared core, and often of high quality Wyandotte chert are diagnostic of the Middle Woodland. In addition, diagnostic spear point types of the Middle Woodland (Justice 1987) include: Snyders points found throughout the Mississippi and Ohio River valleys, north and east into the Great Lakes and west into Oklahoma and Kansas; Copena points found in southern Indiana, western and southern Illinois, and the Middle South; Steuben Expanded Stemmed points, which evolved from Snyders and are diagnostic of the end of the Middle Woodland, and are found from Arkansas and Tennessee in the Mississippi Valley north to the Great Lakes and east throughout Illinois, Indiana, Tennessee, Kentucky, and western Ohio; Bakers Creek, an expanding stemmed point in the southeast deciduous forest core whose northern limits reach the Ohio River Valley; Lowe Flared Base points, another expanding stemmed point appearing after A.D. 200 that is diagnostic of the Mann complex and Allison-LaMotte, and found in western and southern Illinois, central and southern Indiana, south to Kentucky and Tennessee; and Chesser Notched points, an expanding stemmed point which evolved from Snyders, and is found from about Posey County up the Ohio into West Virginia, and eastern New York.

One of the most important Middle Woodland sites in Indiana is the Mann Site located on a high terrace bordering the broad floodplain of the Ohio River in Posey County (Kellar 1979). This site dates from ca. A.D. 300 and consists of a 200 acre "regional transaction center" containing numerous mounds, 16 geometric earthworks, and a huge village site. It is located on a high terrace along the Ohio River, about which geologist John Collett (1883) wrote, "There is no other locality on all the banks of the Ohio River, from Pittsburgh to its mouth, where eight continuous miles of high banks, above all high water, can be found". This part of Posey County is in an ecotone where bottoms of the Wabash and Ohio Rivers and uplands all come together. It is a unique area that Seeman (1979) states, "provides certain advantages for the aboriginal exploitation of a wide range of plant and animal resources". Carlson (1979) writes that the Mann Site appears to be part of "a highly sophisticated pattern of reciprocal trade" and reports that some archaeologists argue for the possibility that the Mann Site was a center for the manufacture of small pottery figurines, "since hundreds of fragments were mixed with the village debris". He believes that these figurines may have been manufactured as a "specialty of tribes in southern Illinois" and traded for other goods throughout the realm among the Hopewell elite. Griffin (1979:268) states that the Mann Site is "the most important link between the Southern Ohio Hopewell sites and the Havana-Hopewellian complex in the Illinois Valley."

The Mount Vernon Mound located approximately 5 miles west of the Mann site in Posey County with an estimated volume of 11,000 cubic meters was one of the five largest Middle Woodland mounds ever recorded in the Midwest (Ruby 1993). The mound was originally loaf shaped, approximately 22 meters long (400'), nearly 52 meters wide (170') and 6 meters high (20') (Tomak 1994b, 1996). Only the Hopewell 25 mound in Ohio with 49,400 cubic meters, Mann 9 mound in Posey County Indiana with 17,700 cubic meters, Seip mound in Ohio with 14,700 cubic meters, and Mann 1 mound in Posey County with 13,200 cubic meters are larger (Ruby 1993). Although recorded as an Indian mound on a USDA county soils map (McWilliams 1979) it did not come under protection until 1988 after 6 meters of mound fill had been removed for county roadway construction and the site had been looted for several months. "Thousands of Hopewell artifacts had been taken from the mound by construction workers and collectors"…"including thousands of chert bifaces, large points / blades of chert, obsidian, quartz crystal and cannel coal, copper celts, copper and silver plates, panpipes, and earspools, copper covered wooden artifacts, silver covered hemispheres, mica, pearls, marine shell beads, bear canine teeth, worked human mandibles and decorated leather objects" (Tomak 1994b, 1996). As a result of an FBI investigation about 3,000 artifacts were recovered, and five of the looters were convicted under the Archaeological Resources Protection Act (ARPA), marking the first time archaeological resources on private lands were protected under this law (Beard 1997).

Hopewell sites in Ohio include large and complex geometric earthworks and burial mound clusters (Griffin 1983:262-262). Mortuary goods reflect a wide sphere of interaction for Hopewell peoples. Copper, silver, galena, meteoric iron, quartz crystal, mica, obsidian, Ohio pipestone, and marine shell commonly appear in burials as raw materials or artifacts. Human and animal effigies in clay, on carved platform pipes or in cut mica are among the broad array of elaborate Hopewell artifact forms (Griffin 1967:184). Greber (1979) has identified some social divisions and "high ranking" individuals using mortuary data, but the structure of Hopewell society cannot be reliably inferred from the data (Griffin 1983:263). Havana Hopewell in western Illinois includes smaller mound burials and similar types of mortuary goods, though no geometric earthworks are present (Griffin 1983:268). A similar Hopewellian complex is known in western Michigan (Fitting 1978:47-49). Other mound building, stamped ceramic cultural complexes have been identified in the Great Lakes area, such as Laurel in Minnesota, northern Wisconsin, Michigan, southeastern Manitoba and western Ontario (Griffin 1983:271). In northern Indiana, southeastern Michigan, and northern Ohio, poorly understood Middle Woodland complexes await further clarification (Fitting 1978:47). Middle Woodland Havana Hopewell collapsed about A.D. 500, after which few long distance trade goods, exotic artifacts or raw materials are found, and intrusive burials into the Hopewell mounds begin to take place.

Schurr (2003a, b) has identified the Goodall Tradition in northwestern Indiana as being a manifestation of Middle Woodland Hopewell and a regional variant of Havana Hopewell from Illinois. He notes that "Goodall sites are widely distributed within and

along the margins of the Kankakee marsh" … with "habitation sites scattered throughout the area and mound sites usually located on outwash terrace margins adjacent to the marsh". Early Havana decorated ceramics have been found throughout northwestern Indiana, and along the upper St. Joseph River in Michigan."

The Allison-LaMotte tradition, originally defined by Winters (1967) for the Middle Wabash Valley, is present in southwest Indiana toward the end of the Middle Woodland period. Allison-LaMotte is generally characterized by oval structures, stamped ceramics, Lowe Cluster points, and increasing evidence for plant cultivation (Kellar 1983). Excavated Allison-LaMotte sites have revealed features, evidence for hillside middens, points from the Lowe Cluster (Allison/Lowe points), celts, rectanguloid gorgets, L-shaped stone pipes, and cord-marked and stamped pottery. Some sites include mortuary and non-mortuary mound groups.

Late Woodland (A.D. 500 - 1000)

The transition to the Late Woodland period is marked by the abrupt decline of fluorescent Hopewellian complexes, though in many areas no decline from established regional Middle Woodland patterns is seen (Stoltman 1978:721-22). Hicks (1992) writes, "Just why [Hopewell fell apart] is not understood. Perhaps it was because the population had grown beyond the level their subsistence technology could support; perhaps because of deterioration in the climate with a resulting shorter growing season; perhaps because of epidemic disease or warfare... In the Hopewell heartland in southern Ohio, the primary earthworks belonging to this period look more defensive, surrounding hilltops, and the first points that can be interpreted as true arrowheads appear. In Indiana, life seems to have returned to a simpler hunting and gathering way of life that for most of the state was to continue relatively unchanged until the arrival of the Europeans, although along the Ohio Valley and in the Lower Wabash area after A.D. 900 we begin to see traces of a new, more structured society, with its roots to the south in the Mississippi Valley and perhaps beyond in Mesoamerica."

The early Late Woodland in central and southern Illinois is characterized by cord-marked ceramics and small, scattered sites typical of a generalized economy. Similar cord-marked ceramics are also noted for western Michigan (Fitting 1978:54). In southern Ohio and southeastern Indiana the Newtown complex includes large villages with circular house plans and material culture characterized by Lowe Flared Base points, Chesser Stemmed points, and cord-marked ceramics (Griffin 1983:272-273).

In southwest Indiana, along the middle to lower Wabash River valley, villages of the Albee complex were first defined. "Albee immediately follows the Allison-LaMotte occupation of the area and ... dates sometime between about A.D. 700 and A.D. 1200" (Tomak 1983). Excavation of an Albee cemetery revealed tools, beads, gorgets, and cord-marked ceramics with distinctive wedge-shaped rims (Kellar 1983:50). Botanical remains from the Albee complex Morell-Sheets Site (12-My-87) in west-central Indiana

suggest a roughly equal use of maize and wild plants at a spring through summer occupation (Bush 1994:7).

In northwestern Indiana a regional variant of Albee appears to be present, although "the precise nature of… [this variant] remains unclear, as does its relationship to the better known Albee occupations of central Indiana (Secunda et al. 2002:15-16). In northeastern Indiana the Late Woodland occupations appear to be closely related to the Western Basin Tradition of Lake Erie (Stothers and Pratt 1981:91-121). Stothers et al. (1994:135-196) believes Springwells people were forced westward and south into the Western Basin area by intrusive Wolf phase peoples around A.D. 1300. Pottery sherds from the Springwells Phase of the Younge tradition have been noted extending from Michigan southwest as far as the Bowen Site in Marion County, Indiana (McCullough 1991:174).

Mississippian (A.D. 1000 - 1679)

Between ca. A.D. 1150 and 1600 strong westerlies with drying on the western prairie grasslands but perhaps wetter on the Illinois Prairie, as the stronger winds pushed the Rocky Mountain rain shadow much farther east. The huge herds of buffalo would have followed that moisture eastward, possibly explaining their occurrence in Indiana by A.D. 1450. Inhabitants of the Midwest became more intensely horticultural after A.D. 900 and established larger, more sedentary villages characterized by house clusters, storage pits, and stockades (Stoltman 1978:723-724). Such changes may be associated with the improved subsistence during the warming of the Secondary Optimum (A.D. 1000-1200), but the trend towards larger settlements is one that began earlier. Ellis et al. (1989) write "The Mississippian settlement system revolved about large permanent towns and villages located within developed floodplains and terraces. These larger communities served as capitals or regional centers from whence radiated a larger number of related, albeit smaller villages and farmsteads." In the American Bottom along the Mississippi River near present day St. Louis, the Cahokia Site represents Mississippian cultural fluorescence. During Cahokia's apogee (A.D. 950-1300) people engaged in the construction of enormous platform mounds (Griffin 1983:278-280). Cahokia was linked through cultural similarity and interaction to a number of independently derived expressions throughout the Midwest and Southeast. As the largest Mississippian center, Cahokia is thought to have exerted considerable influence throughout this area and at its margins (Stoltman 1978:725; Griffin 1983:280-282).

In southern Indiana the Angel, Murphy, and Vincennes Complexes represent Mississippian cultural patterns. The forty-hectare Angel Mounds Site and associated villages, hamlets, and camps are located in the southwestern tip of the state along the Ohio and Wabash Rivers. The Angel Mounds Site represents a palisaded town with platform mounds, plazas, rectangular house remains, and a main occupation date between 1200 and 1400 A.D. (Black 1967; Griffin 1983). Diagnostic artifacts include typically Mississippian ceramic bowls, bottles, plates and jars and small triangular arrow points. Some Angel vessels feature negative painted motifs and effigies (Griffin 1983:286-288).

Distinctly less complex Mississippian sites of the Murphy and Vincennes complexes are located along the lower Wabash River in Illinois and Indiana (Griffin 1978:550). The Caborn-Welborn phase of Mississippian, with more dispersed and unfortified settlements, replaces earlier Mississippian occupations in the Ohio/Wabash area after A.D. 1450 and continues until the time of European exploration of eastern North America (Griffin 1983:288).

In contrast to the Mississippian cultural patterns in southern Indiana, the Mississippian cultures in northern Indiana are represented by such cultural expressions as the Huber and Fisher Phases (Faulkner 1972). Archaeological evidence shows that the Mississippian peoples of northern Indiana had semi-permanent village sites in the upland areas during the spring and fall, when crops were being planted and harvested, and seasonal, temporary encampments in the vicinity of the vast marshlands of the area while procuring resources during the summer (Faulkner 1972). Deutchman and Dorwin (1979), and Perkins and Doershuk (1993) all note that groups in northern Indiana appear less dependent on corn than did groups further south. They suggest that this is a result of the more uncertain weather conditions and the presence of plentiful marshes, which yielded large amounts of wild floral and faunal resources.

Whereas most of the Late Woodland and Mississippian periods for Indiana provide a general image of cultural continuity, the region became relatively depopulated during the centuries before direct European contact (Hicks 1992:42). Population movements probably resulted from indigenous social and ecological factors as well as indirect impacts from European presence on the continent. Newman (1997) notes a cooling temperature trend in North America during the fifteenth and sixteenth centuries, with a thermal minimum being reached near the end of the seventeenth century. This corresponds to the “Little Ice Age” of Europe and may also have had an affect on population movements out of Indiana at that time.

Historic (A.D. 1679 to Present)

Rene-Robert Cavelier Sieur de La Salle was the first European to enter northern Indiana during one of his explorations in 1679 in his repeated efforts to establish fur trading routes from Canada through the Great Lakes, down the Kankakee to the Mississippi south to the Gulf of Mexico. He claimed all the lands within the Mississippi basin for France in 1682 and named the area Louisiana in honor of King Louis XIV. His written records of his journeys mark the transition from prehistory to the historic in northern Indiana.

Connections between prehistoric and historic Indian groups in Indiana are not clear. In northern Indiana, Faulkner (1972) believes that the Mississippian Fisher phase and the later Huber phase were ancestral to the Miami or some other Illinoisan language people, while Brown (1990:155-160) thinks the Huber Mississippian peoples represent a brief incursion of Chiwere Sioux from the west. Links to the proto-historic Oneota have also been suggested. Sparse records from the 1600’s indicate that the Miami, Illinois, and

Figure 6. Portion of Bowen and Gibson's 1763 map of North America.

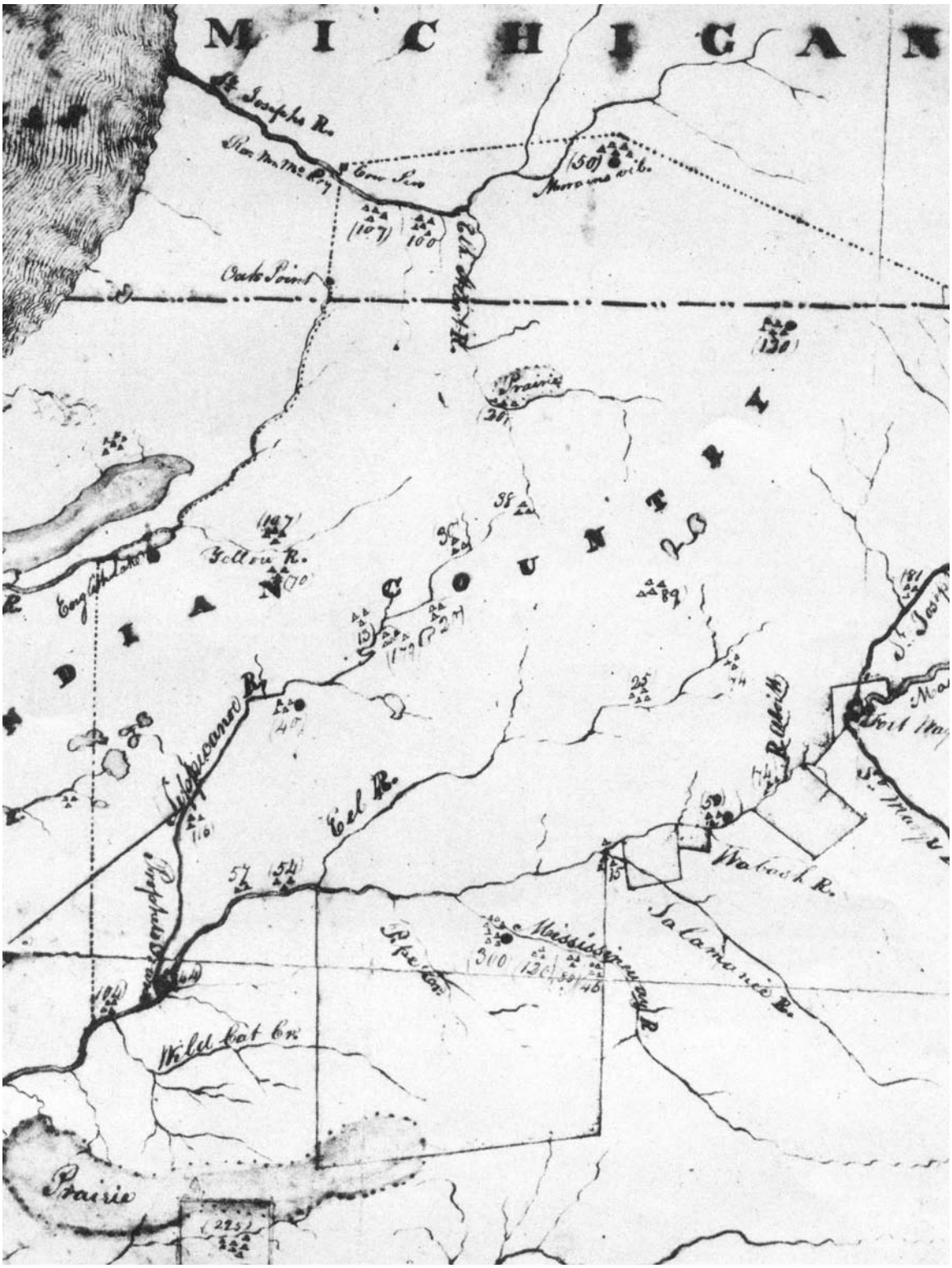

Figure 7. Portion of John Tipton's 1824 *Map Showing the Fort Wayne Indian Agency in Indiana*.

Shawnee were in the area at that time. However, in the late 1600's the coastal Iroquois of New York acquired firearms from the Dutch and proceeded to wreck havoc on their neighboring tribes, clearing a vast area north of the Ohio River from New York almost to the Mississippi River. This invasion is documented on "Mitchell's map of 1755 [on which] may be found a note by the cartographer to the effect that" (Black 1934:179),

> The Six Nations [the Iroquois] have extended their Territories to the River Illinois, ever since the year 1672, when they subdued and were incorporated with the Ancient Chaouanons, the Native Proprietors of these Countries, and the River Ohio: Besides which they likewise claim a Right of Conquest over the Illinois, and all the Mississippi as far as they extend. This is confirmed by their own Claims and Possessions in 1742, which include all the Bounds here laid down, and none have ever thought fit to dispute them (Mitchell 1755).

The French restored technological parity by providing firearms to the Iroquois' neighbors, and Miami settlement of the area resumed in Indiana by 1680 (Barnhart and Riker 1971). By the 1700s the Wea, Piankashaw, Potawatomi, Wyandotte, Kickapoo, and Delaware had followed, as white man's diseases, weapons, and greed first for furs, and then for new lands, decimated the native populations, pushing the Indian ever westward.

Miami Chief Little Turtle laid claim for the Miami, Potawatomi, and Wabash Indians, all the lands contained in Indiana, western Ohio, and the eastern edge of Illinois in a speech to General Wayne at the Treaty of Greenville on August 21, 1795 (Wheeler - Voegelin et al. 1974):

> You have pointed out to us the boundary line between the Indians and the United States; but I now take the liberty to inform you that the line cuts off from the Indians a large portion of country without molestation or dispute. The prints of my ancestor's houses are everywhere to be seen in the portion.... It is well known that my forefather kindled the first fire at Detroit; from thence he extended his lines to the headwaters of the Scioto; from thence to its mouth; from thence down the Ohio to the mouth of the Wabash; and from thence to Chicago, on Lake Michigan. At this place I first saw my elder brothers the Shawnees.

Then, along with the chiefs of eleven other tribes, he sold over 25,000 square miles of this land to the United States government for about four cents an acre as part of a land-for-peace settlement.

Feeling the vulnerability of the new republic's western flank as threats of war from the British continued, President Thomas Jefferson issued a mandate to Territorial Governor Wm. H. Harrison to either "civilize" the Indians or "remove" them so that the western lands could be opened for "civilized" use. Organized patterns of 40-acre farmsteads and towns were much easier to defend than the vast forest hunting grounds

necessary for the lifestyle practiced by native peoples. Beginning in 1803, Governor Harrison negotiated a series of purchases from the Indians by treaty (Figures 8 and 9).

Alarmed at the rapid pace in which they were loosing their lands to the whites, Chief Tecumseh, an Indian statesman and warrior, began an effort to unite the various tribes against the sale of their common lands and with his brother, the Prophet, established the Indian Capitol of "Prophetstown" along the Wabash a few miles east of present day Lafayette. The British, still stung by their loss of the colonies, continued to encourage the Indians to resist the new republic while preparing for their attack on the American Capitol in the War of 1812. This resistance resulted in the Battle of Tippecanoe in 1811, when Harrison's troops marched to Prophetstown, defeated the Indians, and burned the town. The armed resistance to the white expansion in Indiana was over. The concessions and treaties continued. The Treaty of Mississinewa in 1826 and the Treaty of Tippecanoe in 1832 made the lands that are currently Marshall and St. Joseph Counties available for Euro-American settlement. By 1840 resistance to the white expansion in Indiana was over. Except for small isolated bands, the native populations had been "removed", some at gunpoint, to lands "forever theirs" west of the Mississippi. Prior to this removal, northern Indiana contained 36 Potawatomi and 23 Miami communities (Tanner 1987).

Many of the first settlers of this area migrated northward along the state's first north-south highway, the Michigan Road (Figure 10). This road was surveyed through the area in 1828, made "passable to wagons" by 1834, and completed in 1837 (Montgomery 1902; Prather 1941; Taylor et al. 1989). According to Prather (1941), "…with only a few minor changes in routing, this road, …still curves up across Indiana from Madison on the Ohio River in southeastern Indiana to Michigan City in the northwestern corner of the state." Secunda et al. (2002) noted that the Michigan Road followed an older Indian trail through what is now Marshall and St. Joseph Counties.

Marshall County

Marshall County (Figures 11, 12, and 13) was organized in 1836. The county was named for United States Supreme Court Chief Justice John Marshall (Baker and Carmony 1975; Taylor et al. 1989). Plymouth was platted in 1834, established as the county seat in 1836, and incorporated in 1851 (Taylor et al. 1989). At the time of organization the county had a population of about 600 Euro-Americans, and over 1000 Potawatomi living on reservations. The natural setting found by the early settlers was broadleaf forested uplands, dry and wet prairie, marshlands, and oak "barrens". Faulkner (1961:9) noted that "bison were said to have roamed the grasslands before the arrival of the white man". Agriculture was difficult at first, due to the necessity of draining the marshlands, especially in the northern portion of the county (Brant and Fuller 1890; Historic Landmarks Foundation 1990; Taylor et al. 1989). Lapaz was laid out in 1873 along the route of the Baltimore and Ohio (B & O) Railroad. It was either named for the capital of Bolivia or the city in Western Mexico (Baker and Carmony 1975:87).

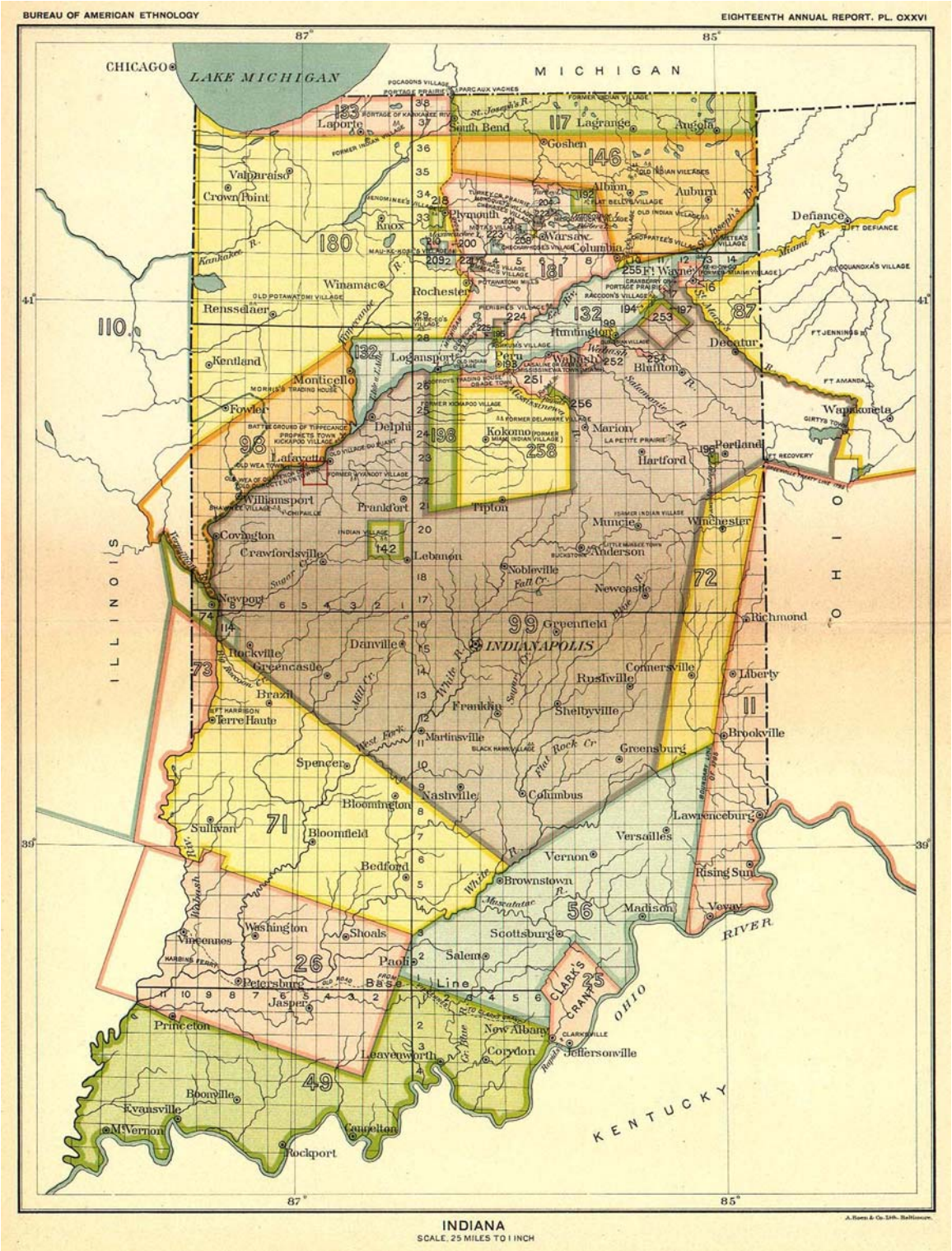

Figure 8. Map showing Indian land cessions in Indiana (Royce 1899).

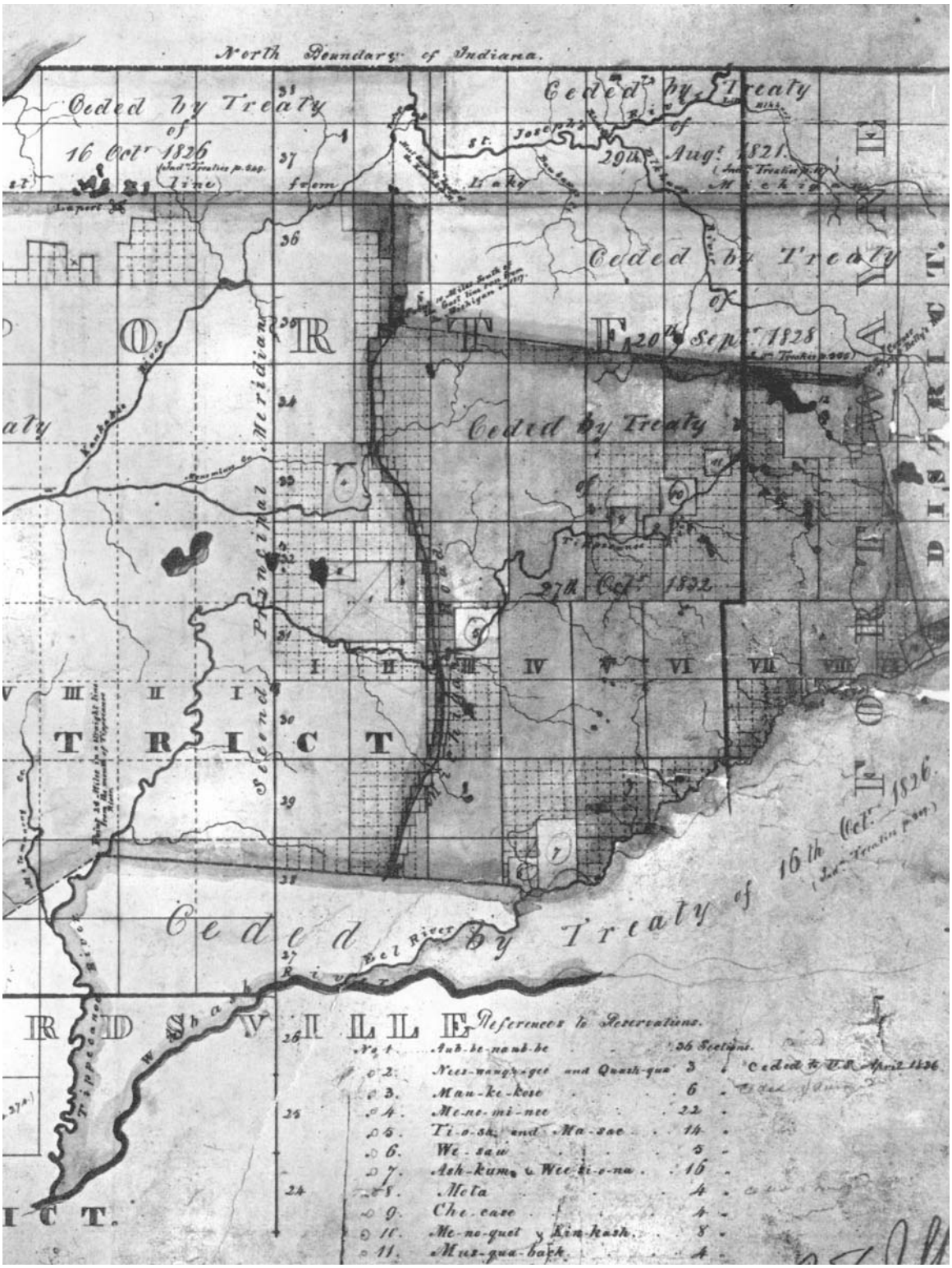

Figure 9. Portion of *Map of Lands Ceded by the Potawatamies under Treaties of the 20th 26th & 27th of October 1832* (General Land Office 1835).

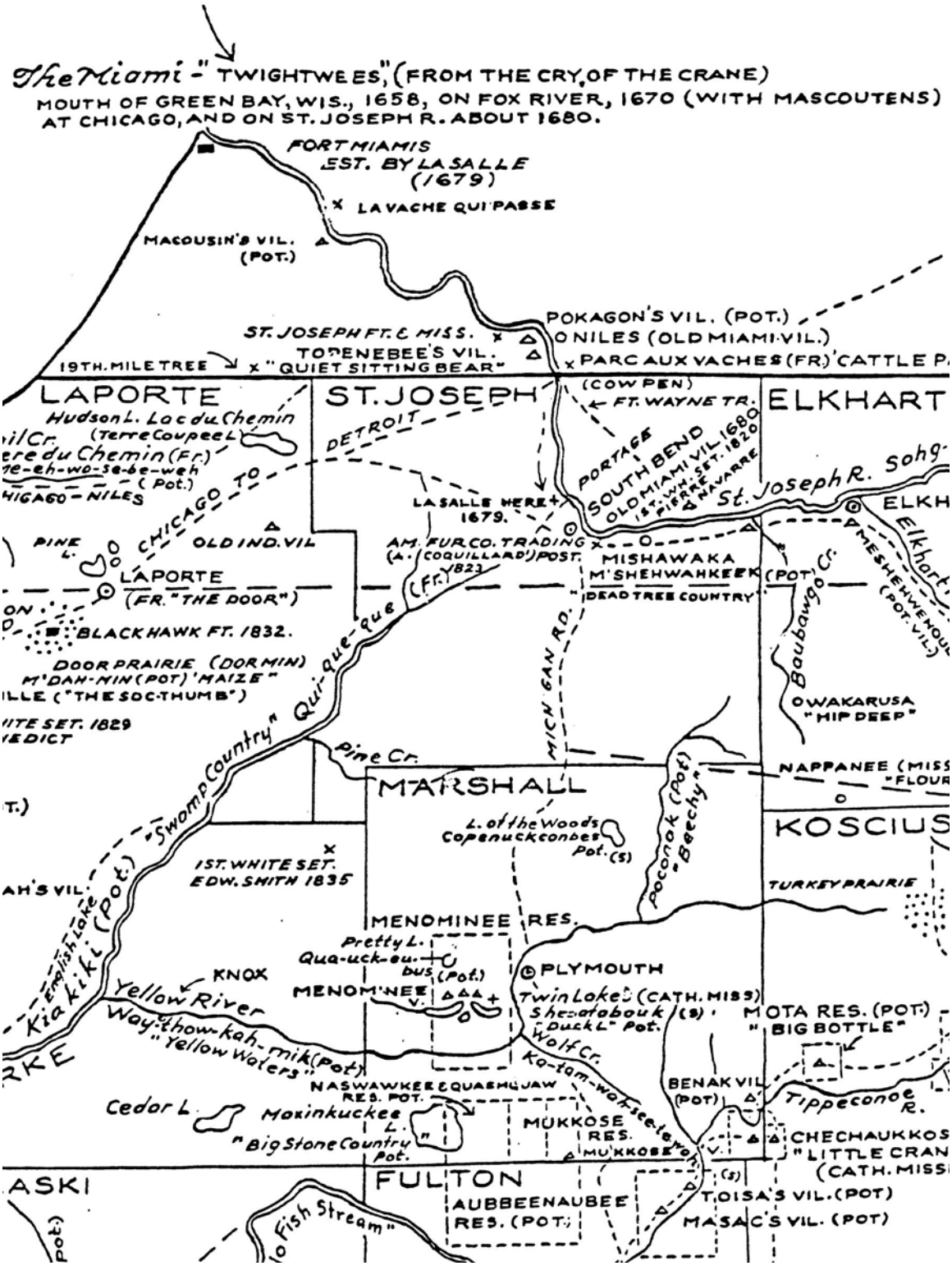

Figure 10. Portion of a map showing the Michigan Road as well as various Native American trails and villages in the vicinity of the project area (Guernsey 1933).

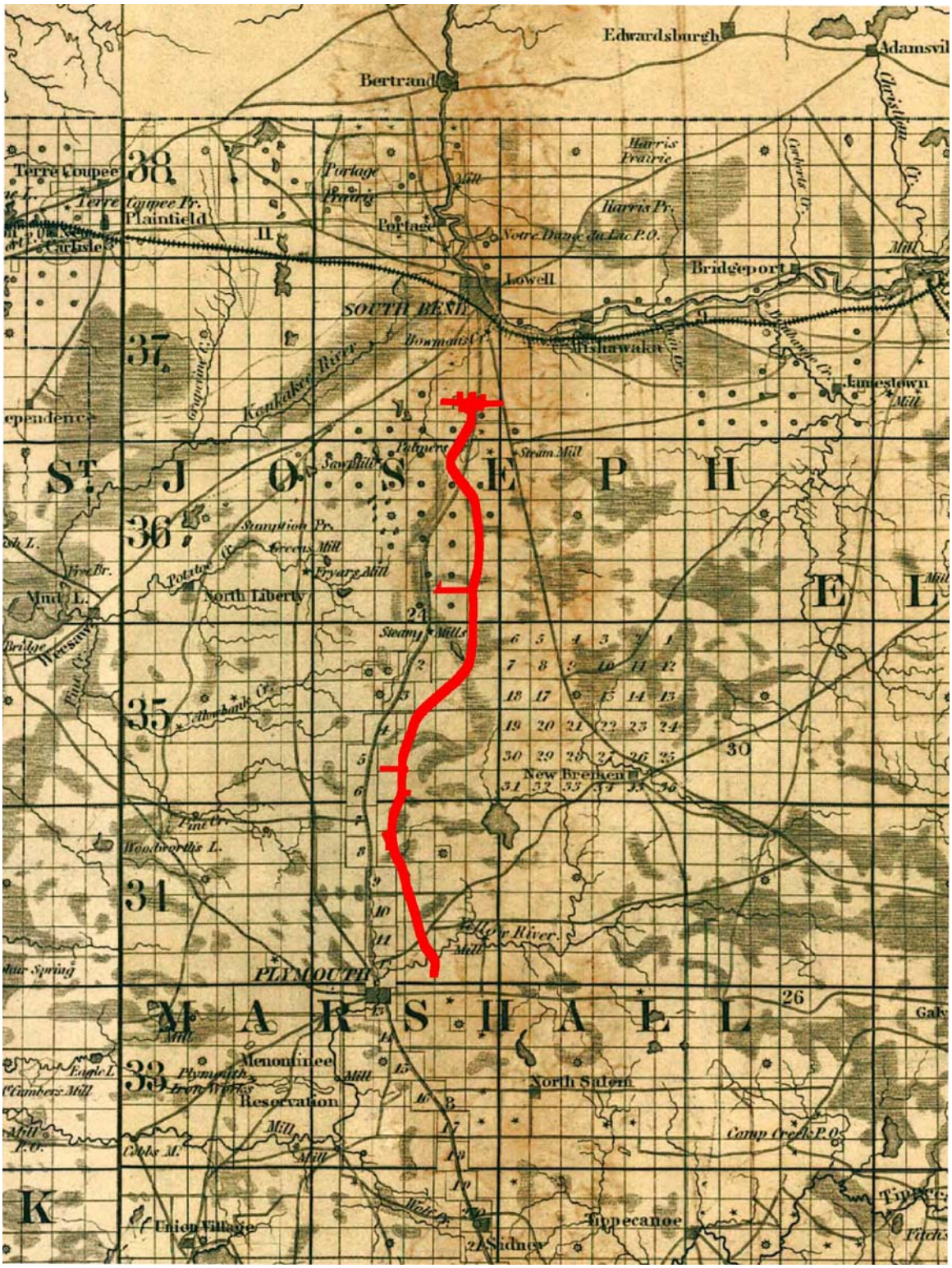

Figure 11. 1852 Map of the project area (Colton 1852).

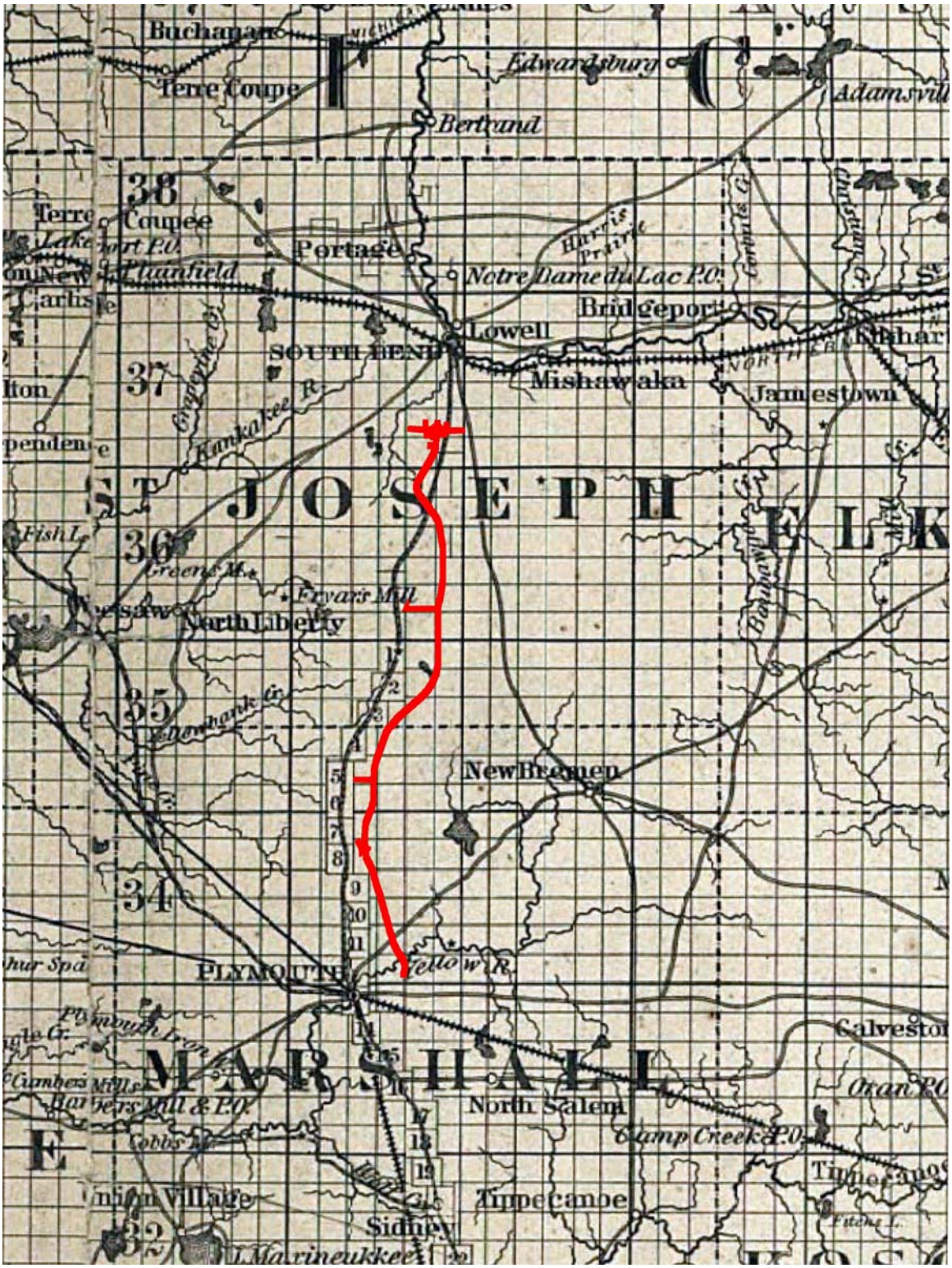

Figure 12. 1860 map of the project area (Colton 1860).

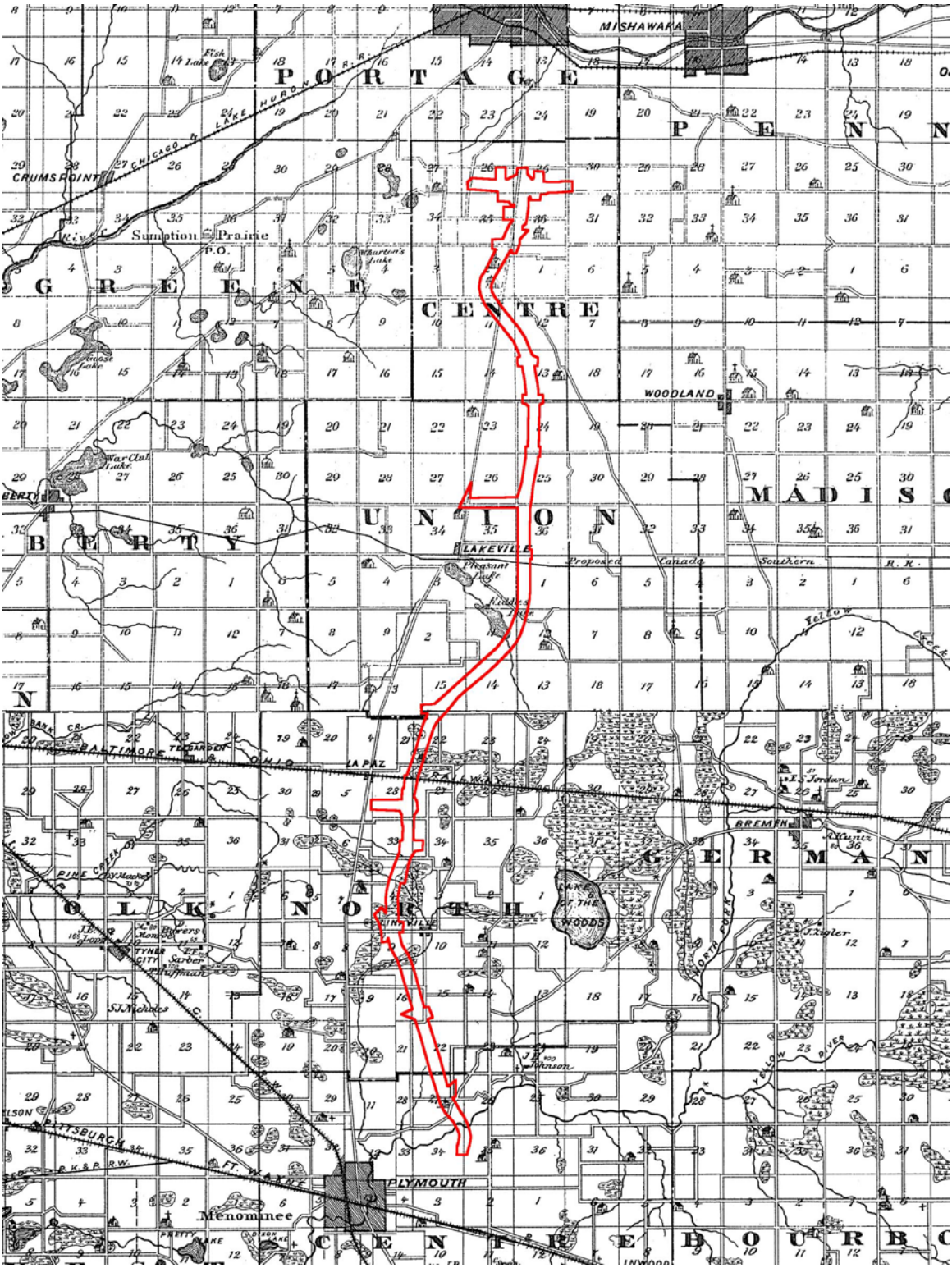

Figure 13. Portions of the 1876 maps of Marshall and St. Joseph Counties, Indiana showing the project area (Indiana Historical Society 1968).

St. Joseph County

St. Joseph County (Figures 11, 12, and 13) was organized in 1830 with South Bend as the county seat. Initially, the western boundary of St. Joseph County extended to the state's western border but the existing boundaries were established by 1850. The county was named after the St. Joseph River, which flows through the county (Baker and Carmony 1975; Taylor et al. 1989). LaSalle is said to have traversed the county in 1679, following the St. Joseph River (then known as the River of the Miamis) from Lake Michigan and portaging westward into the Kankakee River in his quest to establish fur trading routes for King Louis XIV. The first white settler in the county was a Frenchman named Pierre Navarre who arrived in the area in 1820 as an agent for John Jacob Astor's American Fur Company. Navarre was followed shortly by Alexis Coquillard who built another trading post on the St. Joseph River in 1823. The population of St. Joseph County was 287 in 1830 and had increased to 6,415 by 1840 (Prather 1941). Early settlement of the county was hampered by the presence of extensive swamp lands which were not drained until the second half of the nineteenth century. The land was sold following installation of a massive system of tile and drainage ditches. Lakeville was platted in 1857 and named for the chain of small lakes nearby (Baker and Carmony 1975:86).

ARCHAEOLOGICAL RECORDS CHECK

The archaeological records check and literature search for the US 31 project was completed during the alternative selection process and encompassed multiple alternatives (Carson and Plunkett 2003). The records check utilized the resources of several organizations and facilities in order to provide a complete and comprehensive view of the existing known prehistoric and historic archaeological sites present within the US 31 study area. In addition, previous archaeological research and compliance projects within and around the proposed alternatives were examined in order to facilitate the determining of the archaeological potential within the study area.

The primary data for this project was obtained from the archaeological site forms, computer database, topographic maps, and report files at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA). In addition, other reports concerning previous archaeological work in the area on file at Landmark Archaeological and Environmental Services, Inc., which would contribute to the understanding of the archaeological nature and potential of the project area, were also examined.

Historical maps and documents examined included original county histories, such as county maps, road maps, and plat maps from the late nineteenth and early twentieth centuries were also studied in order to assess the potential for historic archaeological sites within the project area.

The cemetery data for Marshall and St. Joseph Counties was obtained from the cemetery database records at the IDNR, DHPA, the USGS 7.5 Minute topographic maps, and the County Interim Reports. This was done in order to assist in the recommendations of avoidance for the known historic cemeteries affected by the study. No cemeteries were found within the final preferred alignment.

Previous Archaeological Studies

It is important to note that there has been very little archaeological research done in north-central Indiana as compared to the remainder of the state, resulting in a limited understanding of the prehistory of this area (Deutchman and Dorwin 1979; McGowan et al. 1998; Schurr 2003a). The majority of archaeological studies in northern Indiana have concentrated in the northeastern or northwestern portions of the state, particularly along the major drainages such as the Kankakee River and lower St. Joseph River, as well as along Lake Michigan. These studies have tended to focus on Middle Woodland, Late Woodland, and Mississippian cultural manifestations (Faulkner 1960, 1972; Garland and Clark 1981; Mangold 1997; Schurr 1993, 1996, 2003a, 2003b). Faulkner (1972:14) notes that the early archaeological investigations in northern Indiana were "mound-oriented" and failed to mention any other prehistoric cultures other than what was similar to Middle Woodland Hopewellian expressions. As Secunda et al. (2002:14) state, "in general, differences in cultural occupations across northern Indiana are better known for Late Prehistoric occupations than they are for earlier ones", which in turn may be the result of this earlier "mound-oriented" focus.

Professionals unfortunately often refer to the north-central portion of the state as an "archaeological void". That is not to say that archaeological sites do not exist, only that very little work has been done in the way of recording them. Schurr (2003a) points out that the area south and east of the Kankakee drainage, where the current US 31 project is located, has been particularly neglected by archaeological research within the state.

Some of the basic framework for the understanding of the prehistory of the last millennium for northwestern Indiana has come from investigations of the Moccasin Bluff Site located in the lower St. Joseph River Valley in southwestern Michigan (Schurr 2003a). Moccasin Bluff is a large multi-component site located on a terrace near the St. Joseph River that was occupied for approximately 8,000 years. According to Fitting (1970), this site was excavated in 1948 by the University of Michigan and is the most extensively excavated site in southwestern Michigan. The Upper Mississippian components at the Moccasin Bluff Site are very similar to the Fisher and Huber Phases of northwestern Indiana, as defined by Faulkner (1972), and may indicate an expansion of these cultural traits into southwestern Michigan from northwestern Indiana (McAllister 1999).

Other studies conducted in southwestern Michigan also indicate prehistoric cultural ties to northern Indiana (Garland 1986; Garland and Clark 1981; Garland and

Mangold 1980; Mangold 1981). Again, some of these cultural comparisons focus on Woodland and Mississippian traditions. However, Mangold (1981) does discuss the presence of a sparse number of Paleo-Indian sites as well as a number of Archaic sites in his survey of the Galien River Basin, portions of which extend into northern Indiana and St. Joseph County (Mangold 1981). In addition, sites excavated in the right-of-way of US 31 project in Berrien County, Michigan (Garland and Clark 1981) revealed Late Archaic occupations on several of the sites.

One of the best sources on information on the recorded prehistoric resources of the project area comes from Ervin Stuntz, an amateur historian with a keen interest in the prehistory of northern Indiana. His works, *The Incredible Wheel of Time* Vols. I and II (Stuntz 1983 and 1984), while not professional studies do provide information pertaining to the locations of Indian villages and burial grounds in Marshall and St. Joseph Counties based on interviews with local artifact collectors. These works were also examined as part of the background research for this project, and provided valuable relevant information that was utilized during the fieldwork. Several of the sites Stuntz describes roughly correspond to official recorded archaeological sites.

Marshall County

To date there are 419 archaeological sites recorded in Marshall County, 316 of which were recorded by Charles Faulkner (1961). Faulkner's 1959 and 1960 research was based upon both field survey and interviews with local artifact collectors. Of Faulkner's 316 recorded archaeological sites within Marshall County, 35 of the archaeological sites were within Center Township and only 15 archaeological sites were recorded within North Township near the project area. Faulkner (1961) noted that the vast majority of recorded sites represented small seasonal, Woodland period hunting and collecting sites, as opposed to permanent villages. These sites were predominantly located on sand ridges and knolls, which would have been the only areas suitable for habitation within the vast marshlands of the county that existed prior to European settlement and draining. Faulkner surmised that prehistoric groups in this area appeared to be less dependent on horticulture than elsewhere during the same time frame due to the presence of abundant marshland flora and fauna.

An archaeological excavation of the Rouch Site (Bellis 1975), in the western part of Marshall County, was conducted by students from the University of Notre Dame under the direction of Dr. James Bellis in 1975. The Rouch Site was originally identified by Faulkner (1961) and is an Early Archaic to Mississippian lithic workshop.

Other archaeological investigations conducted in Marshall County include various small compliance projects such as road improvements and proposed cellular phone tower locations. Several of these studies were conducted within one mile of the study (Buehrig 1986, Stillwell 2000b, 2000c). No evidence of archaeological resources was found by either Buehrig or Stillwell. E. J. Fabyan recorded 4 archaeological sites during an early

study of an Indiana Department of Highways Plymouth Bypass Alternate study (1978) well outside the present project limits.

Recent research conducted by Dr. Mark Schurr's students from the University of Notre Dame (Secunda et al. 2002) involves the investigation of historic Potawatomi villages in northern Indiana. The project utilized General Land Office (GLO) records to attempt to locate these villages prior to their "removal" in the late 1830s. This study involves portions of Marshall County, although the specific areas surveyed are well outside of this US 31 archaeological investigation.

St. Joseph County

There are 432 archaeological sites recorded in St. Joseph County to date. Although there has been no systematic countywide survey undertaken in St. Joseph County, several larger archaeological surveys have been conducted including various highway corridor studies and other compliance projects.

Deutchman and Dorwin (1979) and Bouchard and Dorwin (1981) surveyed multiple routes around South Bend as part of the US 20 bypass corridor study. The 1979 survey recorded 269 archaeological sites (197 of which were isolated artifact finds not assigned state site numbers) and the 1980 survey recorded 54 additional archaeological sites. Site 12-Sj-26 and seven (7) isolated finds were noted to be near this US 31 project area.

Deutchman and Dorwin (1979:9) determined that prehistoric cultural remains were found in both upland settings and in depressional areas that once bordered glacial ponds, lakes, and marshes. Based upon the results of their survey they concluded that the paucity of recorded sites in north-central Indiana is not just because few archaeological investigations have been done, but that the area was not extensively utilized or occupied during prehistoric times (Deutchman and Dorwin 1979).

This conclusion is supported by subsequent compliance archaeological investigations within St. Joseph County since. The majority of these investigations were for road improvement projects, development projects, and proposed cellular phone tower locations (Bellis n.d., 1983; Cantin 1995a, b; Cochran 1999a, b; Dietrich 1985; Helmkamp et al. 2000; Helmkamp and Javorsek 2001; Keener 2000a, b; Maust 1987; Stillwell 1997, 2000d, 2002; Tomak 1987; Tonetti 1976; Verbka 1994; Wappenstein 1999). Of the above compliance projects, eleven have been conducted within the US 31 study area: (Bellis 1983; Cantin 1995a, b; Cochran 1999a; Helmkamp and Javorsek 2001; Stillwell 1997, 2000d, 2002; Verbka 1994; Wappenstein 1999). None of these eleven archaeological investigations found any evidence of archaeological resources.

The Bellinger Mound Site (12-Sj-6), which was excavated in western St. Joseph County during the early and mid 1990s by the University of Notre Dame provided insight into the Goodall Tradition, a local variant of the Havana Hopewell Tradition defined in

Illinois (Schurr 1996, 1997). Schurr (1997) states that the Bellinger Site is located in a similar topographic setting as other Goodall Tradition mound sites and is situated on a terrace edge adjacent to marshland. Schurr (1997) also notes that Goodall habitation sites are common on dunal islands within the meander belt of the Kankakee River Valley, as well as in the uplands bordering marshes.

Several archaeological surveys and one test excavation have been conducted within boundaries of the Potato Creek State Recreational Area located west of the US 31 study area (Koleszar 1976, 1977; Waters 2001).

FIELD METHODS

All portions of the project area were examined; however, areas that were visually determined to be previously disturbed (e.g. paved roads, side ditches, paved parking areas, residences, commercial complexes, ponds, etc.) were not systematically surveyed. Figures 14 through 17 show the field methods used during these investigations along with the ground cover and visibility for the property that was systematically surveyed. In any portion of the project area where previous disturbance was in question, an appropriate number of shovel probes were placed to clearly determine if the area, in fact, had been previously disturbed.

In the remaining undisturbed portions of the project area, the methods used to systematically examine them were determined by the surface visibility, terrain, and vegetation found.

If the surface visibility was more than 30%, parallel visual pedestrian transects at 10-meter (32.8-foot) intervals were preferred. If a site was found through visual examination, transect intervals were reduced to 5-meter (16.4-foot) and artifacts were collected until a determination of the site boundaries could be made. Once site dimensions were determined and any concentrations indicating possible features were recorded, a total surface collection (usually excluding all but a sample of fire-cracked rock) was completed, bagged, and labeled for later laboratory analysis.

If surface visibility was estimated to be below 30% and the terrain had less than a 20% slope, shovel probes were used. Subsurface investigations were conducted in the form of shovel probe holes 30 cm in diameter and 30 cm in depth placed in a grid pattern at 10-meter (32.8-foot) intervals. Shovel probed soil was examined by hand sifting or screened through a 1/4" mesh hardware cloth and then replaced. If a site was discovered through shovel probes, four subsequent probes were placed in the four cardinal directions, 5 meters (16.4 feet) from the first probe in order to determine site boundaries. Artifacts were collected from the probes and parallel transects continued until the site dimensions were defined or the project boundaries had been reached.

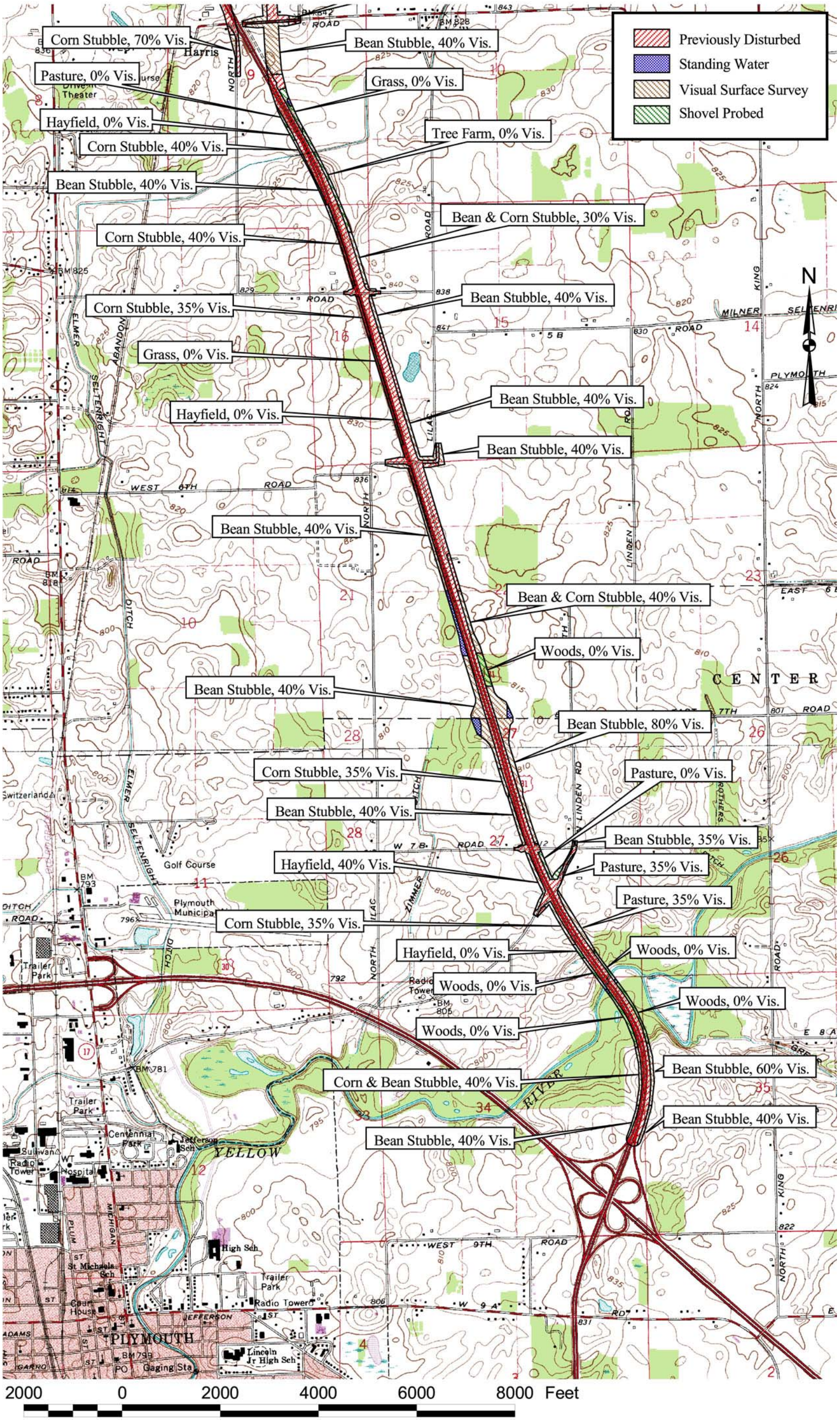

Figure 14. Survey methods used and visibilities within the Project Area as shown on portions of the USGS 7.5 minute series Plymouth and La Paz, Indiana topographic quadrangles.

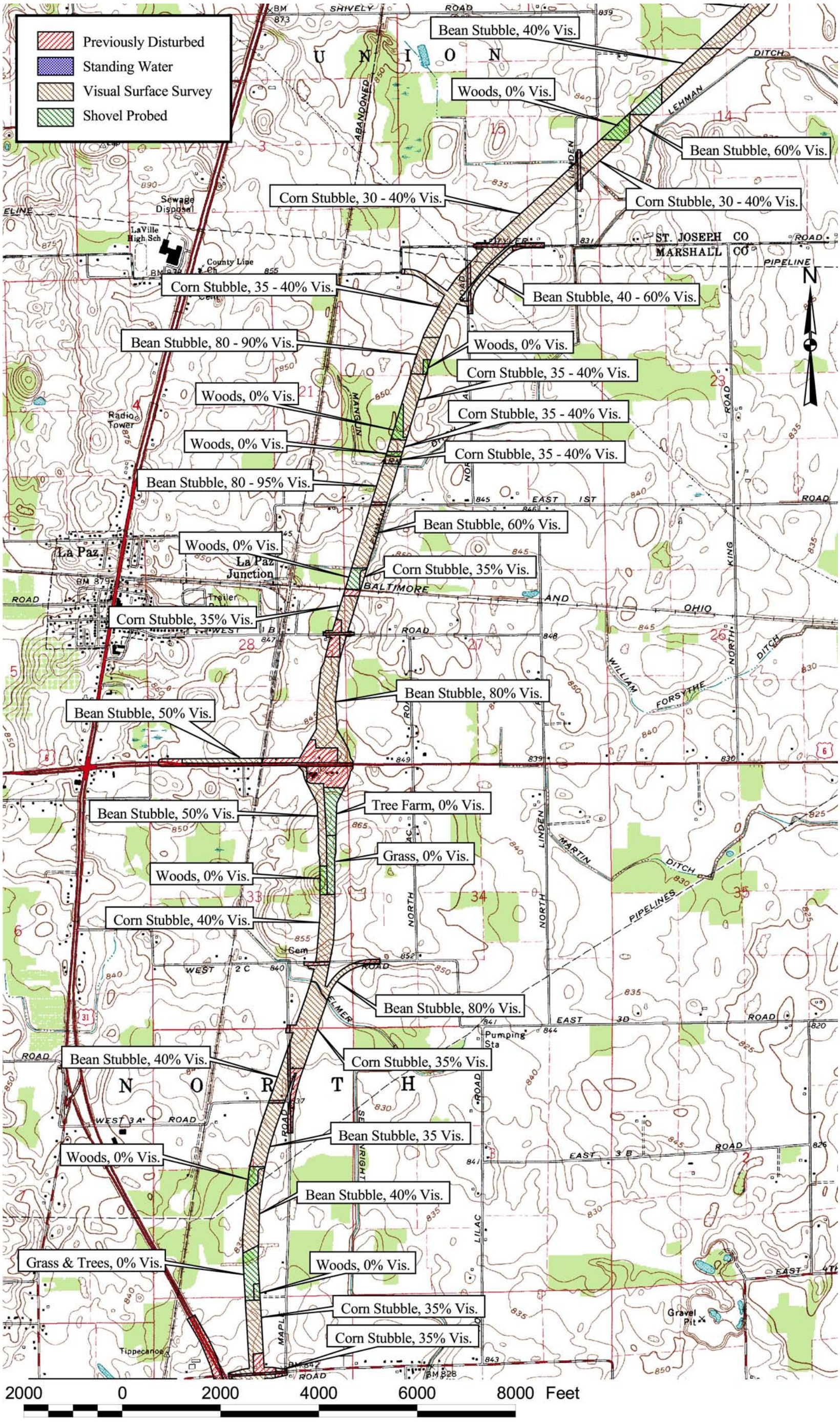

Figure 15. Survey methods used and visibilities within the Project Area as shown on portions of the USGS 7.5 minute series La Paz, Indiana topographic quadrangle.

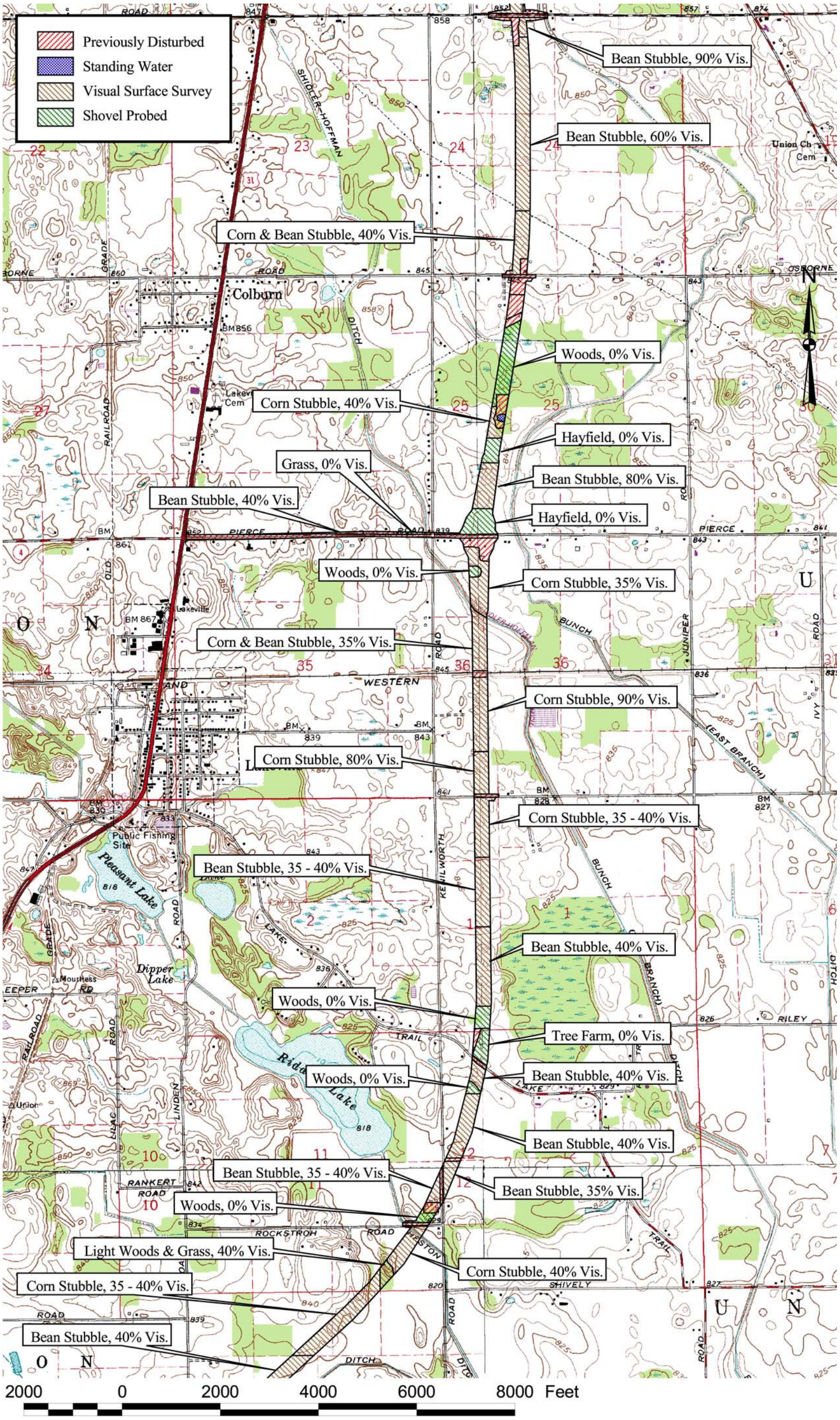

Figure 16. Survey methods used and visibilities within the Project Area as shown on portions of the USGS 7.5 minute series La Paz, Bremen, Lakeville, and Wyatt, Indiana topographic quadrangles.

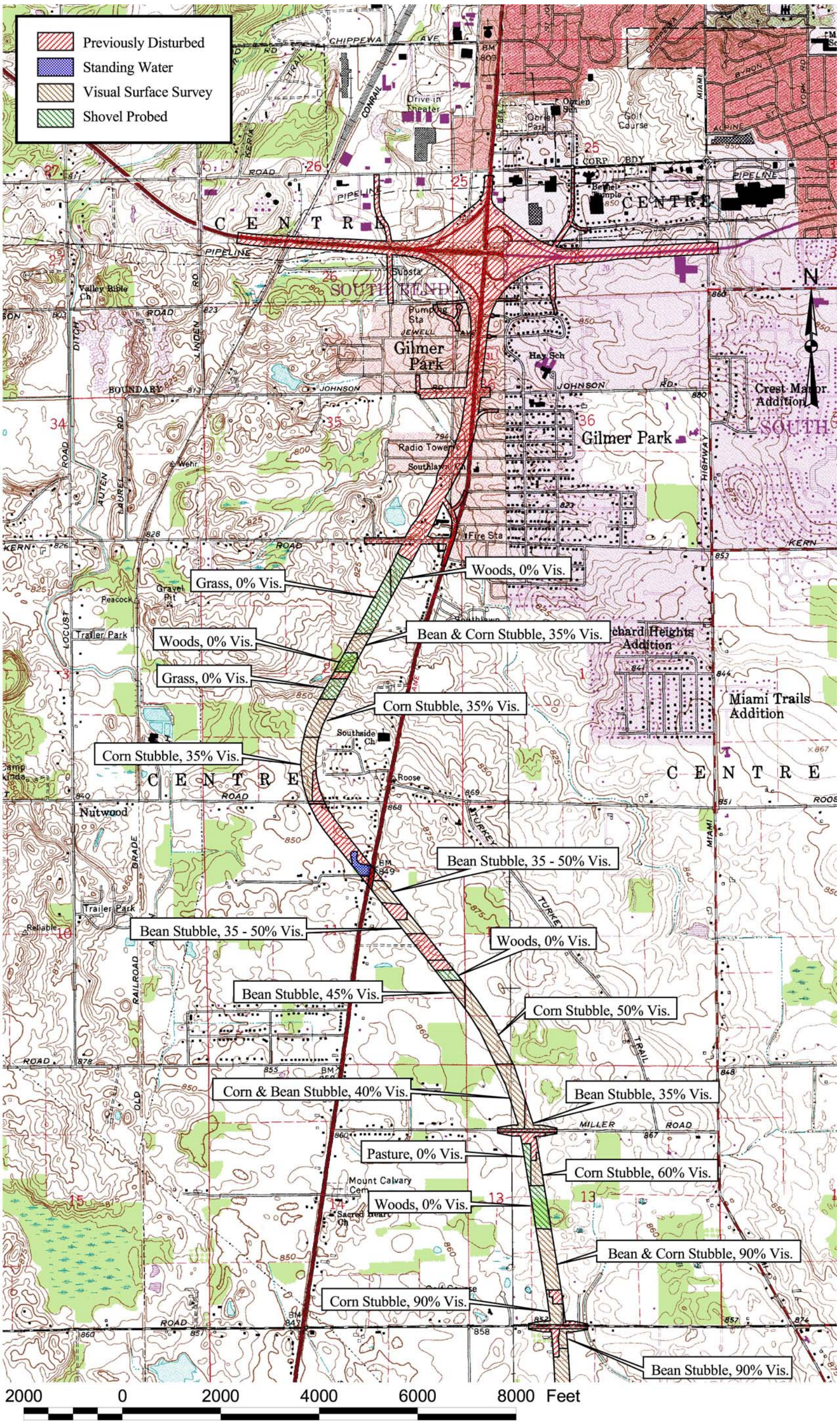

Figure 17. Survey methods used and visibilities within the Project Area as shown on portions of the USGS 7.5 minute series Lakeville, Wyatt, South Bend West, and South Bend East, Indiana topographic quadrangles.

LABORATORY METHODS

All material collected during the field reconnaissance was returned to the laboratory of Landmark Archaeological and Environmental Services, Inc. for processing and temporary curation. Once at the laboratory, the materials were cleaned, cataloged, and analyzed in accordance with standard archaeological laboratory techniques and using the artifact typologies outlined below. Unless otherwise requested by the landowner, all recovered cultural material and field notes will be curated at a state approved curation facility upon approval of the final report by the IDNR, DHPA.

Prehistoric Artifact Typology

Chipped-Stone Artifacts

Chipped-stone artifacts are manufactured primarily from chert and include the products and by-products of lithic-tool manufacture that were produced through percussion and/or pressure flaking techniques (Trader 1992:40). Included in this category are debitage and chert tools.

Debitage

Debitage is the by-product of the chipped-stone-tool manufacturing process. The manufacture of stone tools, particularly chipped-stone tools, is a reductive process (Crabtree 1972:58; White 1963) and the various stages of this lithic-reduction sequence can be determined by analyzing flaking debris resulting from the process (Ahler 1989; Reeder, et al. 1983; White 1963). Debitage can be separated into six categories: cores, shatter, primary flakes, secondary flakes, bifacial thinning flakes, and tertiary flakes.

A *core* is defined as a block or cobble of raw material from which flakes have been removed for further reduction. If fewer than three flakes have been removed from the core, it is classified as a test rock. The flake scars on a core maybe random, fluted, as is the case with blade cores, or turtle back, which represents a controlled removal of flakes.

Shatter is defined as blocky, angular pieces of chert that lack inverse bulbs of force or any identifiable flake attributes (Binford and Quimby 1963:278; Driskell 1986:48). It is often produced by the intentional alteration, through percussion, of lithic raw material frequently as the result of core testing or shaping. However, shatter can also be represented by the medial and distal fragments of flakes that were broken during or at some point following their removal from a core. Some people use the terms “blocky fragment” or “block flake” to describe this class of artifact.

Primary flakes are the result of the initial shaping of a core or intentional removal for tool production. In most cases primary flakes contain a relatively high percentage of cortex on the dorsal side of the flake. These flakes are removed through hard hammer

percussion and therefore have a large bulb, a clear platform, and low length to width ratio. Often these flakes contain radial striations or compression rings.

Secondary flakes are produced primarily by soft hammer percussion and can be created during any stage of lithic reduction. These flakes have little to no cortex; contain a clear bulb, with percussion rings sometimes present and a greater length to width ratio. These lithics usually denote tool manufacture. Secondary flakes may also contain prepared platforms.

*Bifacial thinning flake*s are produced during a specialized stage of tool production. These flakes commonly have a high length to width ratio and are removed mainly by soft hammer percussion; however, they can also be removed by pressure flaking. They have an elongated teardrop shape, a generally subdued bulb, no compression rings, and due to their often thin cross section, most often shatter following their removal. These flakes also typically have prepared platforms and multiple flake scars on the dorsal side.

Tertiary flakes are smaller flakes produced mainly through pressure flaking but can be removed with soft hammer percussion as well. These flakes usually have prepared platforms, little to no bulb, and no compression rings. Tertiary hafting flakes are further specialized flakes that are removed during hafting of a projectile point or knife. These flakes are crescent-moon shaped and are removed with a specific tool that has a flat screwdriver shaped end.

Chert Tools

Chert tools are the end products of the chipped stone-tool manufacturing process. They were created to accomplish specific tasks (i.e. scraping, cutting, chopping, etc.) and can be divided into primarily two groups, formal tools and informal tools. Formal tools are those shaped by intentional chipping; they require a considerable amount of labor compared to that involved in producing an informal tool. The formal tool group includes bifaces, projectile points, drills, end scrapers, side scrapers, gravers, and blades. Informal tools are not extensively shaped, but have functional edges that are produced by marginal, if any, retouch. Retouched and utilized flakes make up the informal tool group.

<u>Formal tools</u>

A *Biface* is an artifact that has flake scars either partially or wholly covering both of its surfaces (Crabtree 1972). Bifaces include both complete and fragmentary specimens of formally manufactured tools that exhibit bifacial retouch (DeMott et al. 1993:8). In the initial stages of manufacture, a biface has all or most of the waste material removed but has not been extensively thinned or shaped (Reeder et al. 1983:14). Following the initial manufacturing stage, one or two processes can occur. First, further thinning and shaping can modify the biface “blank”. At this stage, the working edges are modified for use and are readily usable, perhaps for cutting (Reeder et al. 1983:14; White 1963:9, 23). In the final stages of biface manufacture further thinning and shaping occur, and working edges

and bases are formed for specialized purposes (White 1963:23). Tools produced during this final stage of biface manufacture include projectile points, knives, and drills.

Projectile points are pointed, hafted bifaces that share characteristic attributes such as hafting elements, size, shape, working edges, and flaking techniques and often exhibit certain stylistic variations that are temporally and culturally diagnostic (Ahler and McMillan 1976:165; Reeder 1985:52; Reeder, et al. 1983:14; Trader 1992:66). Projectile points are generally defined as spear points, dart points, or arrow points.

The identification of any projectile points found during this project was done according to the classification presented by Noel D. Justice in his book *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States* (1987). During laboratory analysis, projectile points were further separated according to whether or not they were whole points or fragmentary points.

A *drill*, also termed "perforator" or "piercing tool" (Cree and Cochran 1991:D3), is a late stage biface with a narrow tapering point and a hafting element. The point is square, circular, or diamond shaped when viewed in cross-section and may show some wear from drilling rotation (Lopinot et al. 1982:43). They have "extremely narrow, parallel-sided blades and steep-angled lateral edges" (Ahler and McMillan 1976:179). Cree and Cochran (1991:D3) suggest that some drills may actually represent exhausted cutting tools.

An *end scraper* is produced from a flake or core fragment and has a steeply beveled, unifacially retouched, broad edge. The flake may be flat, ridged, or humpbacked (Ritchie and Funk 1973:21).

A *side scraper* is produced from a flake or core fragment and has steep retouch parallel to the longitudinal axis (Lopinot et al. 1982:47). Side scrapers may show heavy wear on both the retouched and unworked edges (Ritchie and Funk 1973:21).

A *graver* is made on a flake or core fragment by isolating a small, sharp spur through unifacial or bifacial retouch. Utilization may result in significant blunting of the spur and wear on the unworked edges may also be present (Ritchie and Funk 1973:27; Cree and Cochran 1991:D2).

Blades are specialized flake tools that are associated with specific manufacturing techniques (Trader 1992:59). Here, blades have "parallel or sub-parallel edges; and the length is equal to, or more than twice the width" (Crabtree 1972:16).

Informal Tools

Retouched flakes are flakes that were modified intentionally prior to use in order to increase the utility of the working edges (Reeder 1985:52). They are minimally modified debitage, often used for expedient tasks and soon discarded. According to Odell

and Odell-Vereecken (1980:96), retouched flake scars are generally larger, more invasive, and uniform than the edge damage found on utilized flakes.

Utilized flakes are flakes that show macroscopic signs of modification on one or more edges. They are typically secondary flakes that were used as tools but not intentionally modified by retouch (Reeder 1985:52-53). This use results in the blunting, crushing, or removal of tiny flakes along one or more of the edges of the flake (Ritchie and Funk 1973:27). This damage is characterized by small nonrandom flake scars generally concentrated along a lateral edge or a projecting portion of an edge (Odell and Odell-Vereecken 1980:96; Trader 1992:55). Because actual use can only be determined through the microscopic examination of the utilized edge, this category may also include modifications that were the result of protective blunting, platform preparation, and post-depositional environments.

Groundstone Artifacts

Groundstone artifacts are tools that were manufactured by pecking, grinding, and smoothing rather than by flaking. Groundstone tools also include those items that were not shaped intentionally but which were worn and altered through use (Reeder, et al. 1983:14; Trader 1992:71-72). Groundstone tools include celts, grooved axes, hammerstones, metates, and abraders.

Celts are hafted artifacts distinguished by their bits and lack of grooves. Celts are generally either rectangular or triangular in outline (Boisvert et al. 1979:373; Roper and Lepper 1991:319). Celts were used for chopping and cutting, probably as woodworking tools (Boisvert et. al 1979:373; Roper and Lepper 1991:315; Winters 1969:65).

Grooved axes are similar to celts in design and function; except a groove is present which encircles the axe completely or partially. Partially grooved axes are often referred to as “3/4 grooved”. Axes were probably used for chopping and cutting (Boisvert, et. al 1979:373).

Hammerstones are hand-held artifacts that are either rounded or oblong in shape and have been battered at one end and/or along the lateral edges (Trader 1992:72).

Metates were generally used in combination with a *mano* and were part of a complex grinding system in which seeds, plant remains and other food items were prepared (Ahler and McMillan 1976:195). Metates often exhibit at least one ground or pitted surface.

Abraders are small, odd-shaped fragments of either sandstone or limestone. Abraders often exhibit one or more ground surfaces and bear a number of slots or grooves. Abraders may also exhibit either shallow, narrow, v-shaped grooves or deep u-shaped grooves (Trader 1992:73). Abraders may have been used for sharpening bone tools or as “arrow-shaft smoothers” (Chapman 1980).

Unmodified Rock

Unmodified rock consists of lithic materials that were not modified for tool production. Unmodified rock includes all raw materials that were transported to the site for use in manufacture of stone tools. This category also includes all raw materials used in non-tool manufacturing activities such as the building of hearths or as boiling stones (Reeder et al. 1983:14; Trader 1992:85-87). The heat and flames from fires often unintentionally modified the raw materials used to manufacture hearths resulting in fire-cracked rocks.

Fire-cracked rocks "are those igneous, sedimentary or metamorphic stones which exhibit the smooth and/or contorted fractures characteristically caused by intense heat" (Mann 1994:27). Fire-cracked rock found in high densities or concentrations on a site may be indicative of sub-plowzone features.

Historic Artifact Typology

Historic artifacts recovered during the reconnaissance were first sorted by four major material types; ceramic, glass, metal and other. Once this initial sorting was completed, diagnostic artifacts were further identified in order to establish date ranges for the artifacts recovered. A brief discussion of the typology for major artifact types follows.

Ceramics

Ceramics recovered during the reconnaissance were initially sorted by ware type. This sorting was based primarily on characteristics of paste and glaze. Ceramics recovered during the reconnaissance consist of redware, stoneware, yellowware, whiteware, ironstone and porcelain. These ware types are defined below.

Redware

Redware is a heavy utilitarian ware characterized by a coarse, red paste and a lead glaze. It is believed that redware was produced locally shortly after settlement began as there was an immediate need for inexpensive storage vessels. Redwares early production is attributable to a number of factors. Redware clays exist as surface deposits that were abundant and easily accessible. Redware is produced by firing at a low temperature in crude kilns. Due to these factors redware was relatively easy to produce. Redware, however, also had negative attributes. Because redware was fired at such a low temperature, resulting vessels were relatively fragile and easily broken. In addition, it was known by 1800, that lead glazes were highly toxic. As a result, redware production and usage quickly waned once stoneware clays were discovered, and commercial production and distribution of stoneware became more common (McConnell 1988). In Indiana, the shift from redware usage to stoneware appears to have begun around 1830. It appears that

the production of redware probably all but ceased by 1860, when a number of stoneware manufacturers were in operation in Indiana (Loar et al. 1974).

Stoneware

Stoneware, like redware, is also a coarse, heavy utilitarian ware. However, stoneware is characterized by a gray, off-white to brown, or even red paste and due to differences in the clay used for production, is a much more durable ware than redware. Appropriate clays for stoneware production had to be mined. Thus, production of stoneware was slower to develop in the state than redware production.

Due to a scarcity of documentary sources, it is unclear when stoneware production began in Indiana. It is believed that stoneware production may have begun in, or near, Terre Haute as early as 1795-1805. Several stoneware manufacturers may have existed in Indianapolis as early as the 1830s. These however, were small, family operated businesses with a presumably limited distribution area. The first large stoneware producer in the state was located in Parke County, with operations beginning in 1841. Parke County, as well as Clay and Putnam Counties, quickly became a center of stoneware production, with some potteries operating well into the twentieth century. The Ohio River vicinity also became an important location for stoneware production due to high quality clay deposits found along its banks. Production in towns along the Ohio River began as early as 1854. It appears that by 1860, at the latest, stoneware was widely produced and distributed throughout, Indiana. It was, however, available in limited quantities prior to 1860 (Ketchum 1991; Loar et al. 1974). Stoneware can be further dated by the type of glaze used to treat the vessel before firing.

Salt glazed stoneware

Salt-glazing, produced by throwing salt in the kiln while the vessel was being fired, was among the first glazing processes used on stoneware produced in the United States. This technique was long-lived and was the most commonly used glaze on American stoneware throughout the nineteenth century. Other glazing techniques would begin to replace this method during the last half of the nineteenth century. Salt-glazed stonewares are characterized by pitting of the vessel surface, similar to the texture of a tangerine or orange peel (Greer 1981:180-192).

Slip glazed stoneware

The process of applying a slip glaze to stoneware began in the United States in the early nineteenth century and had become quite common by the middle of the century. Slip glazes are made from natural clays which are strained and made into a liquid form that would then be used to coat unfired stoneware vessels. Slip glazes form a smooth, untextured, opaque glaze generally found in dark brown tones. After 1860 the majority of exterior salt glazed vessels exhibit a slip glazed interior. By the last quarter of the

nineteenth century, vessels with both interior and exterior slip glazes were very common (Greer 1981:194-202).

Bristol slip glazed stonewares

Bristol slip glaze is a smooth, white, chemically produced glaze first used in the United States circa 1884. This white glaze was immediately popular. Vessels with an exterior Bristol slip glaze and an interior brown slip glaze were popular until 1920. After 1920 the majority of stoneware vessels exhibit the white Bristol glaze on both the interior and the exterior surfaces (Greer 1981:210-213).

Yellowware

Yellowware is manufactured from clays which fire to a yellow hue. In most cases the ware was treated with a clear glaze which permitted the natural yellow color of the ceramic body to show. The most common form of decoration found on yellowware is an annular pattern of various colored horizontal bands. Yellowware production began in the United States as early as 1797. Vessels of this ware type were particularly popular during the first half of the twentieth century. This long period of manufacture makes it particularly difficult to date yellowware vessels (Ketchum 1987).

Whiteware

Whiteware is defined as refined, nonvitreous, white-bodied earthenware that exhibits a truly white color, unlike earlier ceramic types which have a bluish or cream colored tint. A beginning date for whiteware production is difficult to determine as experimentation to produce a “whiter” ceramic began in the eighteenth century. However, by 1830 whiteware became the predominant ware. The majority of whitewares exhibited some form of decoration. A list of common decorative motifs found on whiteware and date ranges for their production are provided in Table 3. Dates provided in the table are based on Lofstrom et al. (1982), Majewski and O’Brien (1987) and Price (1979).The production of decorated whiteware ended circa 1860. The production of undecorated forms, however, continues to the present day (Lofstrom et al.1982:5-8; Majewski and O’Brien 1987:118-120; Noel Home 1969:128-131; Price 1979:13-15).

Table 3. Date ranges for decorative motifs commonly found on whiteware.

Ceramic Type	**Date Range**
Undecorated	1820-present
Blue Edge Decorated	1820-1860
Green Edge Decorated	1820-1860
Hand Painted Cobalt Blue Floral Motif	1820-1860
Hand Painted Polychrome Floral Motif	1820-1860
Blue Transfer Print	1820-1860
Black Transfer Print	1830-1860
Brown Transfer Print	1828-1850

Ceramic Type	Date Range
Green Transfer Print	1828-1850
Purple Transfer Print	1830-1860
Red Transfer Print	1828-1850
Flow Blue	1835- ca. 1900
Flow Black	1835- ca. 1900
Colored Glaze	post 1900
Over glaze decal	post 1880

Ironstone

Ironstone is defined as a semi-vitreous white-bodied ware intermediate in hardness between earthenwares, such as whiteware, and porcelain. Ironstone was introduced by Josiah Spode in 1805. These early ironstones consisted of a high fired, fine grained earthenware with a slightly blue-gray tint. Improvements in ironstone were made in the 1840's resulting in what has been termed "classic" ironstone. Classic ironstone is a heavy, white-bodied ware, which was either undecorated or decorated with molded patterns. These forms of ironstone were quite popular between 1860 and 1880. By 1880, American tastes had changed again. At this point ironstone evolved into a lighter weight ware. The decoration of ceramics once again became popular and common late nineteenth and early twentieth century decorative motifs include a revival of transfer printing, primarily in the form of monochrome floral motifs, flow blue and abstract motifs. By the end of the nineteenth century, the use of transfer printing declined and over-glaze decal decoration became popular. This method of ceramic decoration continued well into the twentieth century. Ironstone wares continue to be made today (Majewski and O'Brien 1987:120-124, 143-147).

Porcelain

Porcelain is defined as a dense, highly vitreous, white-bodied ware (Majewski and O'Brien 1987:124) which was first produced in China sometime between A. D. 618 and 907. This ware continues to be produced today. Due to its long manufacturing history, undecorated porcelain is not particularly diagnostic. Over glaze decal motifs on gilded or embossed vessels were common after 1880 and well into the twentieth century. Porcelain with colored glazes was produced after 1900 (Majewski and O'Brien 1987).

Glass

Glass artifacts collected were sorted into two initial categories, flat and vessel/bottle glass. The flat glass category primarily represents broken window glass. While broken window glass is very common on historic archaeological sites, it is generally recovered in fragmentary pieces which are not particularly diagnostic. Vessel/bottle glass represents broken bottles or other containers such as tablewares. Glass included in this category was further identified by color and, where appropriate, by bottle or jar morphology.

Color

Vessel/bottle glass recovered during the reconnaissance was first sorted by color. Glass color is highly variable and is greatly affected by metallic oxides naturally present in the materials used in glass production and by chemicals intentionally added to the process. Due to this variability, dating glass by color alone is almost impossible. Although glass color is not a particularly diagnostic attribute, the sorting of sherds by color does help in the process of mending broken vessels and in the establishment of a minimal vessel count for a particular archaeological site (Jones and Sullivan 1989). Since the majority of the recovered glass was very fragmentary and identifiable by color only, few of the glass artifacts recovered provided useful date ranges. Date ranges for two specific glass types, manganese and milk glass, can be established.

Manganese Glass

This type of glass is characterized by a slight purplish tint. This purplish tint results when glass which has been rendered colorless by the addition of manganese is exposed to direct sunlight. Manganese was commonly used as a de-coloring agent during the last quarter of the nineteenth century and up until World War I (Jones and Sullivan 1989:13; Newman 1970).

Milk Glass

Milk glass is defined as an opaque white glass. Although produced earlier, it became widely used by the late nineteenth century for tablewares, containers and lighting devices (Jones and Sullivan 1989:14).

Milk glass was also commonly used to produce glass liners for various types of canning jar lids. These liners were first invented by Lewis Boyd in 1869. Closure types requiring glass liners were used well into the twentieth century (Jones and Sullivan 1989:165; Toulouse 1969:499).

Manufacturing Technology

The manufacturing of glass within the United States saw extensive advances from the seventeenth century to the twentieth century with manufacturing progressing from hand blowing techniques to the use of fully automated machinery. This technological progression has resulted in glass vessels having diagnostic traits, such as mold seams or differing closure methods, which can be used in dating individual specimens. A significant portion of the vessel is generally necessary in order to identify diagnostic traits. As mentioned previously, the majority of the glass recovered during the reconnaissance is very fragmentary and consists primarily of nondiagnostic specimens. Rather than providing a lengthy history of glass manufacturing which is not particularly

relevant to the project, glass artifacts with diagnostic attributes will be discussed within the context of site descriptions.

Metal

Metal artifacts recovered during the reconnaissance consisted of railroad spikes, miscellaneous hardware such as hinges, wire fragments, and unidentifiable fragments. None of the items collected had any diagnostic attributes.

Other

Artifacts included in the other category included items such as plastic and rubber hose fragments. It is likely that the majority of these items represent relatively modern contamination of historical sites.

RESULTS

Thomas Beard, Principal Investigator, with the assistance of Matthew Beard, Jacob Beard, and James Mendenhall of Landmark Archaeological and Environmental Services, Inc. conducted the Phase Ia archaeological field reconnaissance of the project area from November 28, 2004 to June 15, 2005.

Although the project area covers a total of 1011 acres (409.15 hectares), 431 acres (174.43 hectares) of this area were found to be located on previously disturbed land consisting of existing road right-of-ways and residential and commercial properties. In addition, 7 acres (2.83 hectares) of the project area were covered by standing water in the form of ditches, creeks, ponds, wetlands, and a river. This left 573 acres (231.89 hectares) of the project area that needed to be subjected to systematic archaeological survey. Of this remaining area to be surveyed, 458 acres (185.35 hectares) were examined using visual pedestrian transects and 115 acres (46.54 hectares) were shovel probed.

Twenty previously undocumented archaeological sites (12-Mr-413 to 419 and 12-Sj-420 to 432) were found and three previously recorded archaeological sites (12-Mr-308, 12-Mr-318, and 12-Sj-26) were resurveyed during these investigations.

12-Mr-413

UTM Coordinates: Zone 16, 560926 East, 4578769 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 50 ft. (15.24 m) N/S by 50 ft. (15.24 m) E/W
Elevation: 805 ft. a.m.s.l.
Topographic Setting: Upland moraine
Soil type: Oshtemo loamy sand, 6-12% slopes (OsC)
Nearest water source: Yellow River

Distance to nearest water: 800 feet to the northeast
Surface visibility: 40%

Site 12-Mr-413 consists of a small historic artifact scatter/dump site found during a visual pedestrian reconnaissance in the NE ¼ of the NE ¼ of the SE ¼ of the NE ¼ of Section 34 (north and east grid alignment), Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Plymouth, Indiana quadrangle (Figure 18). The site is situated on the uplands (Figure 19) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 40% ground surface visibility. The soil type consisted of Oshtemo loamy sand, 6-12% slopes (OsC), which is a moderately sloping, deep, well-drained soil found on undulating outwash plains and on moraines. Site size was determined by the artifact scatter to be approximately 50 ft. (15.24 m) N/S by 50 ft. (15.24 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	aqua flat glass	2.5 g
2	aqua vessel glass	6.4 g
1	brown vessel glass	9.9 g
1	milk glass canning jar lid sherd	4.8 g
1	embossed ironstone rim sherd (Figure 20a)	2.8 g
1	embossed ironstone body sherd (Figure 20b)	1.7 g
1	embossed porcelain body sherd (Figure 20c)	2.4 g
1	over-glaze decorated porcelain body sherd (Figure 20d)	

Site 12-Mr-413 is a small historic dump site and rock pile at the corner of an agricultural field that does not represent any structure, person, or place of historic significance. This small site does not appear to be eligible for nomination to the IRHSS or the NRHP and, therefore, no further archaeological work is recommended.

12-Mr-318

Site 12-Mr-318 is a previously recorded archaeological site reported as “unknown prehistoric” in the IDNR, DHPA site files. The site is located on a southern terrace of the upper reaches of the Yellow River in the NE ¼ of the NE ¼ of the NE ¼ of Section 34 (north and east grid alignment), Township 34 North, Range 2 East, as shown on a portion of the USGS 7.5 minute series Plymouth, Indiana quadrangle (Figure 18). The site appears to have been destroyed during the construction of the existing four-lane US 31 right-of-way. Intensive shovel probing reduced from 10 meter to 5 meter intervals on both sides of the reported location, now in woods with less than 20% surface visibility (Figures 21 and 22), revealed a sandy terrace that could have a high potential for aboriginal habitation. However, no indications of prehistoric artifacts were found within the proposed new right-of-way. Faulkner (1961:14) notes “quite a number of sites are found along the Yellow River in the southwestern part of Center Township, (Marshall County) but there is a decrease in larger sites further north along the river”. He notes that many of

"This figure has been removed from the report since the location of archaeological sites is confidential. For location of archaeological sites, please contact Ben Lawrence (Administrator for Environmental Policy, Office Environmental Services) at the Indiana Department of Transportation".

Figure 18. Location of Sites 12- Mr-308, 318, and 413 to 415 as shown on portions of the USGS 7.5 minutes series Plymouth and La Paz, Indiana topographic quadrangles.

Figure 19. View of Site 12-Mr-413 looking west.

Figure 20. Artifacts from Site 12-Mr-413;(a) embossed ironstone rim sherd, (b) embossed ironstone body sherd, (c) embossed porcelain body sherd, (d) over-glaze decorated porcelain body sherd.

Figure 21. View of Site 12-Mr-318 looking east from US 31.

Figure 22. View of Site 12-Mr-318 looking west from US 31.

the sites found along the streams and lakes “yielded only fire cracked or burned rock”, representative of “overnight stops used for many years”. Buried prehistoric resources are highly unlikely on this terrace along the upper reaches of the Yellow River which through several deep shovel probes revealed no evidence of riverine deposition, but rather of sheet erosion into the undisturbed sandy subsoil, perhaps due to the proximity of the earlier roadway construction.

Previously recorded site 12-Mr-318 appears to have been destroyed by the construction of existing US 31 and does not appear to be eligible for nomination to the IRHSS or NRHP. Therefore, no further archaeological work is recommended for this site.

12-Mr-414

UTM Coordinates: Zone 16, 560579 East, 4579510 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: Isolated Find
Elevation: 805 ft. a.m.s.l.
Topographic Setting: Upland slope
Soil type: Crosier loam, 0-6% slopes (CtA)
Nearest water source: Yellow River
Distance to nearest water: 1,100 feet to the southeast
Surface visibility: 35%

Site 12-Mr-414 consists of an unidentified prehistoric isolate documented during a visual pedestrian reconnaissance in the SW ¼ of the NW ¼ of the SE ¼ of the SE ¼ of Section 27 (south and east grid alignment), Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Plymouth, Indiana quadrangle (Figure 18). The site was found on the surface in a heavily grazed cow pasture (Figure 23) at the crest of a slope with 35% surface visibility. The soil type consisted of Crosier loam, 0-2% slopes (CtA), which is a nearly level, deep, somewhat poorly drained soil found on broad flats on the upland till plains and moraines. The single artifact recovered consists of a large fragment of a blade or biface (18.8 g) of Wyandotte chert that has been retouched and utilized on multiple edges (Figure 24). Wyandotte chert outcrops in the Harrison County area of Southern Indiana and does not occur naturally in the glaciated till of Northern Indiana. Cultural affiliation is likely Woodland or later. Shovel probing at 5 meter intervals in all directions combined with visual inspection in the vicinity of the isolate within the proposed new right-of-way revealed no further artifacts.

The area around Site 12-Mr-414 was thoroughly examined through shovel probing. Though the blade fragment is made from a chert type not native to this portion of the state and blades of this kind are sometimes found in caches, the fact that it was retouched and utilized after it was broken indicates that the blade was likely a utilized tool rather than part of a cache. As a result, there is a very low probability of additional cache blades being found within the vicinity of this isolate. Therefore, Site 12-Mr-414

Figure 23. View of Site 12-Mr-414 looking northeast.

Figure 24. Large fragment of a blade or biface of Wyandotte chert from Site 12-Mr-414.

does not appear to be eligible for nomination to the IRHSS or NRHP and no further archaeological work is recommended.

12-Mr-415

UTM Coordinates: Zone 16, 560237 East, 4580264 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 25 ft. (7.62 m) N/S by 25 ft. (7.62 m) E/W
Elevation: 815 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Brookston loam (Br)
Nearest water source: Zimmer Ditch
Distance to nearest water: 2,000 feet to the west-southwest
Surface visibility: 80%

Site 12-Mr-415 consists of a small historic artifact scatter found during a visual pedestrian reconnaissance in the SW ¼ of the NW ¼ of the SW ¼ of the NE ¼ of Section 27 (south and east grid alignment), Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Plymouth, Indiana quadrangle (Figure 18). The site is situated on a till plain (Figure 25) and, at the time of the survey, was located in a well-weathered, bean stubble covered, agricultural field with 80% ground surface visibility. The soil type consisted of Brookston loam (Br), which is a nearly level, deep, very poorly drained soil found on broad flats, in swales, and along drainageways on the upland till plains and moraines. The site is positioned on a slight ridge paralleling the Plymouth to Goshen Trail. Site size was determined by the artifact scatter to be approximately 25 ft. (7.62 m) N/S by 25 ft. (7.62 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	green bottle base sherd	18.4 g
1	undecorated ironstone body sherd	2.0 g

Site 12-Mr-415 consists of two historic artifacts recovered along the Plymouth to Goshen trail, in very poorly drained soil with good surface visibility. This small historic site does not appear to be significant, or eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Mr-308

Site 12-Mr-308 is a previously recorded archaeological site reported as “unknown prehistoric” in the IDNR, DHPA site files, although the state site form notes an isolated Late Woodland/Mississippian trianguloid point as being found. The site is located along the eastern edge of the existing US 31 right-of-way fence (Figure 26) in an unpaved residential access drive in the W ½ of the NW ¼ of the SE ¼ of the NW ¼ of Section 22, Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute La Paz,

Figure 25. View of Site 12-Mr-415 looking east.

Figure 26. View of Site 12-Mr-308 looking east.

Indiana quadrangle (Figure 18). Shovel probing at 5 meter intervals in all directions of the reported site in the drive and adjacent residential lawn, combined with visual examination of the adjacent agricultural field revealed no further archaeological materials. The site appears to have been destroyed during the construction of the private access drive to the residence.

Previously recorded site 12-Mr-308 appears to have been destroyed by the construction of the residential access drive along existing US 31 and does not appear to be eligible for nomination to the IRHSS or NRHP. Therefore, no further archaeological work is recommended for this site.

12-Mr-416

UTM Coordinates: Zone 16, 558693 East, 4585664 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 300 ft. (91.44 m) N/S by 300 ft. (91.44 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland ground moraine
Soil type: Riddles sandy loam, 2-6% slopes (RsB)
Nearest water source: Seltenright Ditch
Distance to nearest water: 1,700 feet to the east
Surface visibility: 0%

Site 12-Mr-416 consists of a recently demolished historic farmstead located in the SW ¼ of the SE ¼ of the SW ¼ of the SE ¼ of Section 4 (north and east grid alignment), Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 27). The site is located on upland moraine (Figure 28) which consisted of Riddles sandy loam, 2-6% slopes (RsB), which is a gently sloping, deep, well-drained soil found on moraines. The house, barn and cinder drive are shown on the 1972 La Paz quadrangle. The site was explored first through visual reconnaissance of the above ground structure remnants including fragments of a concrete slab with iron milking stanchions, piles of scrap corrugated metal sheeting, and other miscellaneous structure debris within the proposed alignment. Site size is estimated to be about 300 ft. (91.44 m) N/S by 300 ft. (91.44 m) E/W and includes a former house structure and small out building east and outside of the proposed new right-of-way as well as the remnants of the barn structure within the new alignment. The structures have been destroyed and the lot extensively bulldozed into several debris piles, severely compromising the integrity of the site. Artifacts were recovered through both surface collection and shovel probing to determine the extent of disturbance. Artifacts recovered from the site consist of the following:

Count	Artifact Description	Weight
1	black glass button (Figure 29a)	1.9 g
1	aqua jar base fragment	31.2 g
1	brown vessel glass sherd	5.9 g

"This figure has been removed from the report since the location of archaeological sites is confidential. For location of archaeological sites, please contact Ben Lawrence (Administrator for Environmental Policy, Office Environmental Services) at the Indiana Department of Transportation".

Figure 27. Location of Sites 12-Mr-416 to 419 as shown on a portion of the USGS 7.5 minute series La Paz, Indiana topographic quadrangles.

Figure 28. View of Site 12-Mr-416 (iron milking stanchions in center of photograph).

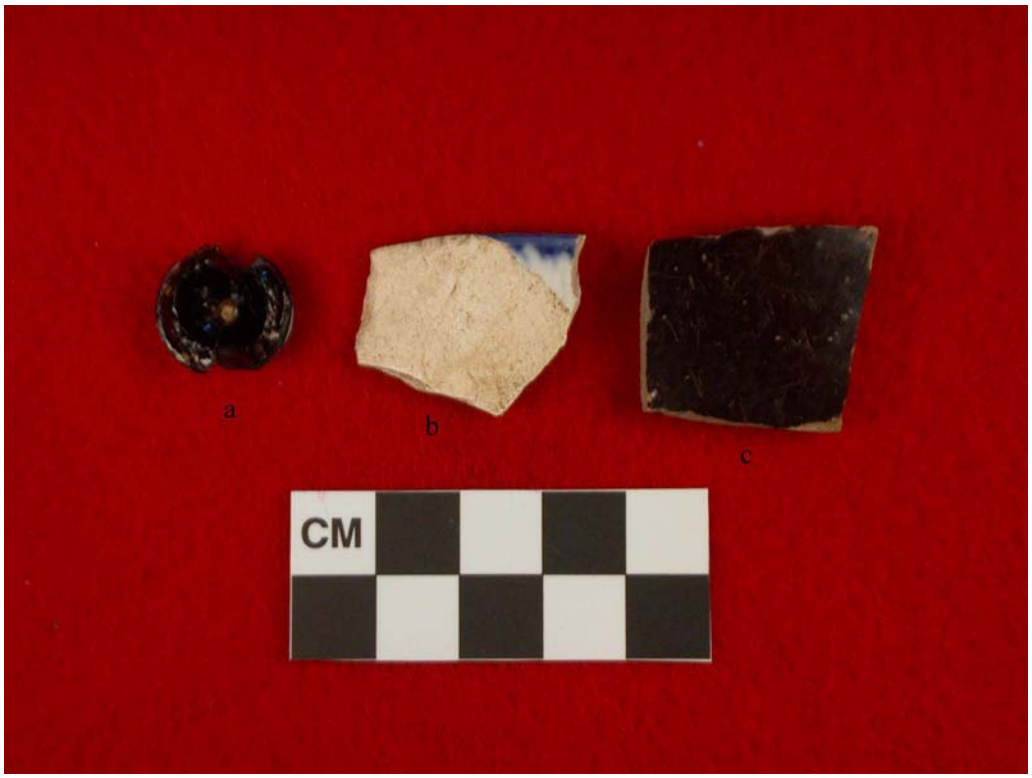

Figure 29. Artifacts from 12-Mr-416; (a) black glass button, (b) shell-edged whiteware rim sherd, (c) stoneware body sherd, interior/exterior is slip glazed.

Count	Artifact Description	Weight
1	milk glass sherd with luster decoration	1.5 g
1	shell edged whiteware rim sherd (Figure 29b)	3.0 g
3	undecorated ironstone body sherds	5.9 g
1	undecorated ironstone base sherd	6.9 g
1	undecorated porcelain rim sherd	1.1 g
1	stoneware body sherd, interior/exterior is slip glazed (Figure 29c)	1.9 g

Site 12-Mr-416 has been severely compromised by bulldozing and has lost all integrity. It does not appear to be significant, or eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended for this site.

12-Mr-417

UTM Coordinates: Zone 16, 558615 East, 4586276 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 100 ft. (30.48 m) NE/SW by 50 ft. (15.24 m) NW/SE
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland flats
Soil type: Pinhook sandy loam, 0-2% slopes (PdA)
Nearest water source: Seltenright Ditch
Distance to nearest water: 2,200 feet to the east
Surface visibility: 40%

Site 12-Mr-417 consists of an historic artifact scatter/dump found during a visual pedestrian reconnaissance in the SE ¼ of the NW ¼ of the NW ¼ of the SE ¼ of Section 4 (north and east grid alignment), Township 34 North, Range 2 East as shown on a portion of the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 27). The site is situated on uplands (Figure 30) and, at the time of the survey, was located in a well-weathered, bean stubble covered, agricultural field with 40% ground surface visibility. The soil type consisted of Pinhook sandy loam, 0-2% slopes (PdA), which is a nearly level, deep, poorly drained soil found on broad flats on outwash plains. Site size was determined by the artifact scatter to be about 100 ft. (30.48 m) NE/SW by 50 ft. (15.24 m) NW/SE. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
7	undecorated whiteware body sherds	7.3 g
1	undecorated whiteware base sherd	2.2 g
1	annular decorated whiteware rim sherd (Figure 31a)	2.6 g
2	undecorated ironstone body sherds	41.6 g
1	undecorated ironstone base sherd	10.5 g
1	stoneware body sherd interior/exterior brown slip glaze (Figure 31b)	2.7 g
1	stoneware rim sherd, tan slip glaze interior/exterior (Figure 31c)	35.1 g
4	brown bottle glass sherds	13.9 g

Figure 30. View of 12-Mr-417 looking west.

Figure 31. Artifacts from 12-Mr-417; (a) annular whiteware, (b) brown slip-glazed stoneware, (c) tan slip-glazed stoneware.

Count	Artifact Description	Weight
2	clear flat glass sherds	1.4 g
13	clear vessel glass sherds	62.5 g
1	clear glass lid sherd	5.5 g
1	clear pressed glass base sherd	10.8 g
1	clear bottle base sherd	11.1 g
1	clear jar base sherd (with Hazel Atlas mark, date range of 1920-1964 [Toulouse 1971:239])	16.6 g
3	aqua glass jar sherds	10.1 g
1	aqua jar mouth sherd	4.5 g
1	aqua jar base sherd	6.2 g
4	green bottle glass sherds	9.7 g
1	blue bottle glass sherds	0.4 g
1	milk glass canning jar lid sherd	1.4 g
3	milk glass body sherds	30.0 g
2	milk glass rim sherds	11.0 g
2	milk glass base sherds	11.2 g
1	embossed milk glass sherd	3.8 g
2	embossed milk glass sherds	4.6 g
1	blue opaque glass sherd	2.0 g
4	green opaque glass body sherds	18.2 g
3	green opaque glass base sherds (Figure 32a, c, and d)	31.5 g
1	green opaque glass rim fragment (Figure 32b)	7.8 g
1	green opaque glass pedestal (with mcK mark) (Figure 33)	29.9 g
1	coal fragment	0.7 g
1	carbon battery rod fragment	2.5 g

Site 12-Mr-417 is a historic dump site in the corner of an agricultural field with very little likelihood of providing significant information concerning the prehistory or history of the region. The site does not appear to be eligible for nomination to the IRHSS or the NRHP and, therefore, no further archaeological work is recommended.

12-Mr-418

UTM Coordinates: Zone 16, 559005 East, 4587665 North (NAD 83)
Cultural Period: Unidentified Prehistoric/Historic
Site Dimensions: 150 ft. (45.72 m) N/S by 150 ft. (45.72 m) E/W
Elevation: 845 ft. a.m.s.l.
Topographic Setting: Ground moraine
Soil type: Riddles sandy loam, 2-6% slopes (RsB)
Nearest water source: Seltenright Ditch
Distance to nearest water: 300 feet to the south
Surface visibility: 80%

Figure 32. Green opaque glass sherds from Site 12-Mr-417

Figure 33. Green opaque glass pedestal with mcK mark from Site 12-Mr-417

Site 12-Mr-418 is a historic farmstead/artifact scatter with a prehistoric component found during a visual pedestrian reconnaissance in the NE ¼ of the NW ¼ of the SE ¼ of the SE ¼ of Section 33 (south and east grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 27). The site is situated on a ground moraine (Figure 34) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 80% ground surface visibility. The soil type consisted of Riddles sandy loam, 2-6% slopes (RsB), which is a gently sloping, deep, well-drained soil found on moraines. Site size was determined by the artifact scatter to be approximately150 ft. (45.72 m) N/S by 150 ft. (45.72 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	milk glass canning jar lid sherd	4.0 g
1	clear vessel glass sherd	9.9 g
3	aqua vessel glass sherds	20.2 g
1	brown bottle base fragment	73.3 g
1	brown bottle (Owens Illinois Glass Co., Toledo Ohio, manufactured between 1929-1954 [Toulouse 1971:403]) (Figure 35)	74.4 g
1	porcelain electrical insulator fragment	3.9 g
2	undecorated ironstone body sherds (Figure 36a)	11.4 g
1	undecorated ironstone base sherd	6.7 g
1	embossed porcelain rim sherd (Figure 36 b)	3.7 g
1	stoneware rim sherd, external salt glazed, internal slip glazed (Figure 36c)	34.3 g
2	stoneware body sherds interior/exterior brown slip glaze (Figure 36d)	45.2 g
1	piece shatter (glacial chert)	6.4 g
1	broken flake (glacial chert)	0.8 g

Site 12-Mr-418 likely represents a barn site associated with the extant house structure across the road. The site has been extensively altered by seasonal plowing and does not appear to be eligible for nomination to the IRHSS or NRHP. Therefore, no further archaeological work is recommended for this site.

12-Mr-419

UTM Coordinates: Zone 16, 559194 East, 4589800 North (NAD 83)
Cultural Period: Late Archaic to Middle Woodland
Site Dimensions: Isolated Find
Elevation: 860 ft. a.m.s.l.
Topographic Setting: Ground moraine
Soil type: Riddles sandy loam, 2-6% slopes (RsB)
Nearest water source: Lehman Ditch
Distance to nearest water: 1,200 feet to the north
Surface visibility: 35%

Figure 34. View of Site 12-Mr-418 looking east.

Figure 35. Brown bottle from Site 12-Mr-418.

Figure 36. Artifacts from Site-12-Mr-418; (a) undecorated ironstone, (b) embossed porcelain rim sherd, (c) salt-glazed stoneware rim, (d) brown slip-glazed stoneware sherd.

Site 12-Mr-419 consists of a prehistoric isolate found during a visual pedestrian reconnaissance in the SE ¼ of the SE ¼ of the SE ¼ of the NE ¼ of Section 28 (south and east grid alignment), Township 35 North, Range 2 East as shown on the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 27). The site is situated on a ground moraine (Figure 37) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 35% ground surface visibility. The soil type consisted of Riddles sandy loam, 2-6% slopes (RsB), which is a gently sloping, deep, well-drained soil found on moraines. A single Middle Woodland, Lowe cluster projectile point/knife (13.4 g) made from Burlington chert (Figure 38) was all that was recovered from this site.

Site 12-Mr-419 is an isolated find recovered in a cornfield with adequate surface visibility. The site is not significant or associated with any people, place, or event of significance. Therefore, the site does not appear to be eligible for nomination to the IRHSS or NRHP and no further archaeological work is recommended.

12-Sj-420

UTM Coordinates: Zone 16, 561497 East, 4593418 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: Isolated Find
Elevation: 835 ft. a.m.s.l.

Figure 37. View of 12-Mr-419 looking north.

Figure 38. Lowe cluster projectile point/knife from 12-Mr-419.

Topographic Setting: Upland till plain
Soil type: Riddles loam, 2-6% slopes (RtB)
Nearest water source: Lehman Ditch
Distance to nearest water: 500 feet to the southeast
Surface visibility: 40%

Site 12-Sj-420 consists of an unidentified prehistoric isolate found during a visual pedestrian reconnaissance in the SE ¼ of the SE ¼ of the NE ¼ of the NW ¼ of Section 14 (south and east grid alignment), Township 35 North, Range 2 East as shown on the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 39). The site is situated on uplands (Figure 40) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 40% ground surface visibility. The soil type consisted of Riddles loam, 2-6% slopes (RtB), which is a gently sloping, deep, well-drained soil found on knolls and long irregular slopes on till plains. The single artifact recovered from the surface of the site consists of a fragment of a projectile point (7.0 g) of unknown type or age (Figure 41) made from Attica chert, which is not found naturally in the glacial gravels of St Joseph County. Attica chert, also known as Independence chert, outcrops along the Wabash River below Lafayette Indiana.

Site 12-Sj-420 is an isolated find recovered on well drained agricultural ground with adequate surface visibility. No further materials were found in association with this single artifact. Therefore, the site does not appear to be eligible for nomination to the IRHSS or NRHP and no further archaeological work is recommended.

12-Sj-421

UTM Coordinates: Zone 16, 561846 East, 4593747 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 300 ft. (91.44 m) N/S by 100 ft. (30.48 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Miami clay loam, 6-12% slopes, severely eroded (MoC3)
Nearest water source: Lehman Ditch
Distance to nearest water: 1,200 feet to the south
Surface visibility: 40%

Site 12-Sj-421 consists of an unidentified prehistoric lithic scatter found during a visual pedestrian reconnaissance in the NW ¼ of the NE ¼ of the NW ¼ of the NE ¼ of Section 14 (south and east grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 39). The site is situated on uplands (Figure 42) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 40% ground surface visibility. The upland extends northwestward, overlooking a huge peat bottom to the east and south. Pleasant Lake just south of Lakeville and Riddles Lake (both north and west of the proposed new alignment) lies within this huge area of bottomland. The soil type consisted of Miami clay

"This figure has been removed from the report since the location of archaeological sites is confidential. For location of archaeological sites, please contact Ben Lawrence (Administrator for Environmental Policy, Office Environmental Services) at the Indiana Department of Transportation".

Figure 39. Location of Sites 12-Sj-420 to 430 as shown on portions of the USGS 7.5 minutes series La Paz, Bremen, Lakeville, and Wyatt, Indiana topographic quadrangles.

Figure 40. View of Site 12-Sj-420 looking west.

Figure 41. Projectile point fragment from Site 12-Sj-420.

Figure 42. View of Site 12-Sj-421 looking northeast.

loam, 6-12% slopes, severely eroded (MoC3), which is a moderately sloping, deep, well-drained soil found on narrow, elongated side slopes and knolls on till plains. Site size was determined by the landform and artifact scatter to be about 300 ft. (91.44 m) N/S by 100 ft. (30.48 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	broken flake (local glacial chert)	0.5 g
1	retouched flake (Burlington chert)	3.3 g
1	water worn cobble (Attica chert)	47.4 g

Site 12-Sj-421 is made up of three small artifacts found over a large site area as defined by the landform. Due to the low density of artifacts found, this site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-422

UTM Coordinates: Zone 16, 561991 East, 4593971 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 300 ft. (91.44 m) N/S by 100 ft. (30.48 m) E/W
Elevation: 835 ft. a.m.s.l.

Topographic Setting: Glacial remnant in upland till
Soil type: Riddles loam, 6-12% slopes, eroded (RtC2)
Nearest water source: Lehman Ditch
Distance to nearest water: 2,000 feet to the south
Surface visibility: 40%

Site 12-Sj-422 is a historic artifact scatter/dump site located in the NW ¼ of the SW ¼ and the SW ¼ of the NW ¼, of the SE ¼ of the SE ¼ of Section 11 (south and east grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series La Paz, Indiana quadrangle (Figure 39). The site is situated just northeast of 12-Sj-421 on a long, narrow, steep-sloped "island" of upland (Figure 43) within the huge drained peat bottoms southeast of Riddles Lake. At the time of the survey, the ground surface visibility on the crest of the steep ridge was 80% in the severely eroded path that follows along the top of the ridge and 40% for the remainder of the crest. An abandoned automobile, old farm equipment, tires and other modern refuse line the wooded slopes of this site. The soil type consisted of Riddles loam, 6-12% slopes, eroded (RtC2), which is a moderately sloping, deep, well-drained soil found on narrow, elongated side slopes on till plains. Site size was determined by the artifact scatter to be roughly 300 ft. (91.44 m) N/S by 100 ft. (30.48 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	**Artifact Description**	**Weight**
1	undecorated whiteware body sherd	2.0 g
1	flow blue whiteware body sherd (Figure 44a)	3.9 g
1	embossed manganese vessel glass sherd (Figure 44b)	4.2 g
1	embossed clear glass fragment	18.8 g

Site 12-Sj-422 consists of a historic scatter of ceramic, glass, and abandoned agricultural farm equipment, tires and other modern refuse. The site has been severely disturbed and does not appear to be eligible for nomination to the IRHSS or NRHP. Therefore, no further archaeological work is recommended for this site. Of course it is always possible that aboriginal peoples utilized this natural rise for burials; however, no indication of this was evident.

12-Sj-423

UTM Coordinates: Zone 16, 562572 East, 4595146 North (NAD 83)
Cultural Period: Woodland
Site Dimensions: Isolated Find
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Crosier loam, 0-2% slopes (CtA)
Nearest water source: Riddles Lake
Distance to nearest water: 2,300 feet to the southwest
Surface visibility: 40%

Figure 43. View of Site 12-Sj-422 looking southwest.

Figure 44. Artifacts from Site 12-Sj-422; (a) flow blue whiteware body sherd, (b) embossed manganese vessel glass sherd.

Site 12-Sj-423 consists of a prehistoric isolate found during a visual pedestrian reconnaissance in the NW ¼ of the SE ¼ of the NW ¼ of the NW ¼ of Section 12 (north and west grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Lakeville, Indiana quadrangle (Figure 39). The site is situated on uplands (Figure 45) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 40% ground surface visibility. The soil type consisted of Crosier loam, 0-2% slopes (CtA), which is a nearly level, deep, somewhat poorly drained soil found on broad flats on till plains. The single artifact recovered from the surface of the site consists of a roughly manufactured, Woodland stemmed projectile point (7.6 g) made from local glacial chert (Figure 46). This point appears to have been heat treated.

Site 12-Sj-423 consists of a single artifact found in an agricultural field with no further materials found associated despite adequate field ground surface visibility. The site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-424

UTM Coordinates: Zone 16, 562562 East, 4595464 North (NAD 83)
Cultural Period: Historic
Site Dimensions: 100 ft. (30.48 m) N/S by 100 ft. (30.48 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Crosier loam, 0-2% slopes (CtA)
Nearest water source: Riddles Lake
Distance to nearest water: 2,600 feet to the southwest
Surface visibility: 0%

Site 12-Sj-424 consists of a historic artifact scatter/dump site found first during a visual reconnaissance of the above ground refuse and second during systematic shovel probing in the woods within the proposed alignment. The site is located in the SW ¼ of the SE ¼ of the SW ¼ of the SW ¼ of Section 1 (south and west grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on uplands (Figure 47) consisting of Crosier loam, 0-2% slopes (CtA), which is a nearly level, deep, somewhat poorly drained soil found on broad flats on till plains. Site size is approximately 100 ft. (30.48 m) N/S by 100 ft. (30.48 m) E/W as defined by the dump debris, including an early 1950's Studebaker truck cab and frame with the seal of South Bend on the door (Figure 48), a Model T wheel and axle, iron bed springs, discarded washing machines, rusted cans, etc. Artifacts recovered from both surface collection and shovel probing from the site consist of the following:

Figure 45. View of Site 12-Sj-423 looking east.

Figure 46. Woodland stemmed projectile point from Site 12-Sj-423.

Figure 47. View of Site 12-Sj-424 look north.

Figure 48. View of 1950's Studebaker truck cab and frame with the seal of South Bend on the door.

Count	Artifact Description	Weight
1	undecorated whiteware body sherd	2.2 g
1	undecorated porcelain body sherd	0.5 g
1	stoneware body sherd interior/exterior brown slip glaze	15.6 g
4	aqua plate glass sherds	13.9 g
1	milk glass canning jar lid liner sherd	2.4 g
1	brown vessel glass sherd	4.1 g
1	coke bottle sherd	14.3 g
3	aqua glass jar sherds	20.5 g

Site 12-Sj-424 is a historic dump site in a wooded area consisting of mostly abandoned vehicles, modern household and agricultural debris. The site is not significant, and does not appear to be eligible for nomination to the IRHSS or the NRHP and, therefore, no further archaeological work is recommended for this site.

12-Sj-425

UTM Coordinates: Zone 16, 562572 East, 4595704 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 400 ft. (121.92 m) N/S by 100 ft. (30.48 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Riddles loam, 2-6% slopes (RtB)
Nearest water source: Riddles Lake
Distance to nearest water: 3,000 feet to the southwest
Surface visibility: 40%

Site 12-Sj-425 consists of an unidentified prehistoric lithic scatter found during a visual pedestrian reconnaissance in the W ½ of the NE ¼ of the SW ¼ of the SW ¼ of Section 1 (south and west grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on a very slight sandy rise adjacent to a large area of wooded wetlands (Figure 49) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 40% ground surface visibility. The soil type consisted of Riddles loam, 2-6% slopes (RtB), which is a gently sloping, deep, well-drained soil found on knolls and long irregular slopes on till plains. Site size was determined by the landform (a very fine sandy rise) and artifact scatter to be approximately 400 ft. (121.92 m) N/S by 100 ft. (30.48 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
2	broken flakes (glacial chert)	0.9 g
1	utilized flake (glacial chert)	5.8 g
1	piece of shatter (glacial chert similar to Laurel)	8.2 g

Figure 49. View of Site 12-Sj-425 looking east.

Site 12-Sj-425 consists of a small prehistoric lithic scatter found over a large area as defined by the landform. Due to the low density of artifacts found the site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-426

UTM Coordinates: Zone 16, 562566 East, 4596722 North (NAD 83)
Cultural Period: Late Woodland/Mississippian
Site Dimensions: Isolated Find
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Martinsville loam, 6-12% slopes, eroded (MeC2)
Nearest water source: Bunch Ditch
Distance to nearest water: 1,600 feet to the northeast
Surface visibility: 40%

Site 12-Sj-426 consists of a prehistoric isolate found during a visual pedestrian reconnaissance in the NW ¼ of the SE ¼ of the NW ¼ of the NW ¼ of Section 1 (south and west grid alignment), Township 35 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated adjacent to a mound-like rise (Figure 50) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 40% ground surface visibility. Chert

Figure 50. View of Site 12-Sj-426 looking south at mound-like rise.

resembling Liston Creek chert can be found on the rise but it appears to be naturally occurring as the rise is being plowed down into the subsoil. The soil type consisted of Martinsville loam, 6-12% slopes, eroded (MeC2), which is a moderately sloping, deep, well-drained soil found on narrow, elongated side slopes and knolls on till plains. The single artifact recovered from the surface of the site consists of a Late Woodland/Mississippian, Madison triangular projectile point (1.8 g) made from non local Attica chert (Figure 51).

Site 12-Sj-426 is an isolated find and does not appear to be eligible for nomination to the IRHSS or NRHP. Therefore, no further archaeological work is recommended for this site. Of course it is always possible that aboriginal peoples utilized this natural rise for burials; however, no indication of this was evident.

12-Sj-427

UTM Coordinates: Zone 16, 562576 East, 4597059 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 400 ft. (121.92 m) N/S by 400 ft. (121.92 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Metea loamy fine sand, 4-10% slopes (MkB)
Nearest water source: Bunch Ditch

Figure 51. Madison triangular projectile point from Site 12-Sj-426.

Distance to nearest water: 1,000 feet to the east
Surface visibility: 80%

Site 12-Sj-427 consists of an unidentified prehistoric lithic scatter found during a visual pedestrian reconnaissance in the S ½ of the NE ¼ and the N ½ of the SE ¼, of the SW ¼ of the SW ¼ of Section 36 (south and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on a very slight sandy rise (Figure 52) and, at the time of the survey, was located in harvested and well-weathered cornfield with 80% ground surface visibility. The rise is adjacent to a large area of wooded wetlands to the east where possible historic native burials were reported (12-Sj-270), but not very likely given the high water table in the woods prior to artificial drainage. The soil type consisted of Metea loamy fine sand, 4-10% slopes (MkB), which is a gently sloping to moderately sloping, deep, well-drained soil found on knolls and ridges on broad till plains. Site size was determined by the landform (an area of fine sand) to be about 400 ft. (121.92 m) N/S by 400 ft. (121.92 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	retouched flake (glacial chert)	5.9 g
2	pieces of shatter (Liston Creek chert)	133.1 g

Figure 52. View of Site 12-Sj-427 looking north.

Site 12-Sj-427 consists of three prehistoric artifacts found over a large area as defined by the landform. Due to the low density of artifacts found, this site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-428

UTM Coordinates: Zone 16, 562578 East, 4597316 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 300 ft. (91.44 m) N/S by 250 ft. (76.2 m) E/W
Elevation: 840 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Riddles loam, 2-6% slopes (RtB)
Nearest water source: Bunch Ditch
Distance to nearest water: 800 feet to the east
Surface visibility: 90%

Site 12-Sj-428 consists of an unidentified prehistoric camp found during a visual pedestrian reconnaissance in the S ½ of the SE ¼ of the NW ¼ of the SW ¼ of Section 36 (south and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on an upland till plain (Figure 53) and, at the time of the survey, was located in harvested and well-weathered cornfield with 90% ground surface visibility. The soil type

Figure 53. View of Site 12-Sj-428 looking east.

consisted of Riddles loam, 2-6% slopes (RtB), which is a gently sloping, deep, well-drained soil found on knolls and long irregular slopes on till plains. Site size was determined by the landform (a very fine sand rise) to be approximately 300 ft. (91.44 m) N/S by 250 ft. (76.2 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	biface (Attica chert)	9.5 g
1	biface fragment (glacial chert)	2.4 g
1	biface thinning flake (Attica chert)	0.5 g
1	tertiary flake (glacial chert)	<0.1 g
3	pieces of fire-cracked rock	207.7 g

Site 12-Sj-428 represents an unidentified prehistoric campsite with fire-cracked rock. The site has been extensively plowed and is subject to wind erosion. Given the small amount of material recovered over a large area as defined by the landform and the extensive disturbance, the site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-429

UTM Coordinates: Zone 16, 562588 East, 4597683 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 100 ft. (30.48 m) N/S by 50 ft. (15.24 m) E/W
Elevation: 845 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Riddles loam, 0-2% slopes (RtA)
Nearest water source: Bunch Ditch
Distance to nearest water: 900 feet to the east
Surface visibility: 40%

Site 12-Sj-429 consists of an unidentified prehistoric lithic scatter found during a visual pedestrian reconnaissance in the SE ¼ of the SE ¼ of the SW ¼ of the NW ¼ of Section 36 (south and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on an upland till plain (Figure 54) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 40% ground surface visibility. The soil type consisted of Riddles loam, 0-2% slopes (RtA), which is a nearly level, deep, well-drained soil found on broad flats in the uplands on till plains. Site size was determined by the landform (an area of fine sand) to be about 100 ft. (30.48 m) N/S by 50 ft. (15.24 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Figure 54. View of Site 12-Sj-429 looking east.

Count	Artifact Description	Weight
1	biface fragment (glacial chert)	1.3 g
1	broken flake (glacial chert)	0.5 g

Site 12-Sj-429 consists of a small unidentified prehistoric lithic scatter found under adequate surface visibility over a large area as defined by the landform. Due to the low density of artifacts found, this site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-430

UTM Coordinates: Zone 16, 562553 East, 4597870 North (NAD 83)
Cultural Period: Unidentified Prehistoric
Site Dimensions: 100 ft. (30.48 m) N/S by 100 ft. (30.48 m) E/W
Elevation: 845 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Riddles loam, 2-6% slopes (RtB)
Nearest water source: Bunch Ditch
Distance to nearest water: 400 feet to the northeast
Surface visibility: 40%

Site 12-Sj-430 consists of an unidentified prehistoric lithic scatter found during a visual pedestrian reconnaissance in the SW ¼ of the NE ¼ of the SW ¼ of the NW ¼ of Section 36 (south and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 39). The site is situated on a upland till plain (Figure 55) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 40% ground surface visibility. The soil type consisted of Riddles loam, 2-6% slopes (RtB), which is a gently sloping, deep, well-drained soil found on knolls and long irregular slopes on till plains. Site size was determined by the landform (an area of fine sand) to be approximately 100 ft. (30.48 m) N/S by 100 ft. (30.48 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	utilized flake (Liston Creek chert)	4.5 g
2	primary flakes (Liston Creek chert)	24.0 g
1	secondary flake (Liston Creek chert)	1.6 g

Site 12-Sj-430 consists of four chert flakes found under adequate surface visibility over a large area as defined by the landform. Due to the low density of artifacts found, the site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

Figure 55. View of Site 12-Sj-430 looking northeast.

12-Sj-431

UTM Coordinates: Zone 16, 562712 East, 4602143 North (NAD 83)
Cultural Period: Late Archaic
Site Dimensions: Isolated Find
Elevation: 865 ft. a.m.s.l.
Topographic Setting: Upland till plain
Soil type: Metea loamy fine sand, 4-10% slopes (MkB)
Nearest water source: Intermittent Drainage of Bunch Ditch
Distance to nearest water: 1,300 feet to the east
Surface visibility: 100%

Site 12-Sj-431 consists of a prehistoric isolate found during a visual pedestrian reconnaissance in the SW ¼ of the SW ¼ of the NE ¼ of the SW ¼ of Section 13 (north and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Wyatt, Indiana quadrangle (Figure 56). The site is situated on an upland till plain (Figure 57) and, at the time of the survey, was located in a harvested and well-weathered beanfield with 100% ground surface visibility. The soil type consisted of Metea loamy fine sand, 4-10% slopes (MkB), which is a gently sloping to moderately sloping, deep, well-drained soil found on knolls and ridges on broad till plains. The single artifact recovered from the surface of the site consists of a Late Archaic, Lamoka cluster projectile point (2.9 grams) made from heat-treated Attica chert (Figure 58), which is not found in the local gravels, but outcrops along the Wabash River below Lafayette, Indiana.

"This figure has been removed from the report since the location of archaeological sites is confidential. For location of archaeological sites, please contact Ben Lawrence (Administrator for Environmental Policy, Office Environmental Services) at the Indiana Department of Transportation".

Figure 56. Location of Sites 12-Sj-26,431 and 432 as shown on portions of the USGS 7.5 minute series Lakeville and Wyatt, Indiana topographic quadrangles.

Figure 57. View of Site 12-Sj-431 looking east.

Figure 58. Late Archaic Lamoka cluster projectile point from Site 12-Sj-431.

Site 12-Sj-431 is a Late Archaic isolated find. No further materials were discovered associated with the isolate despite good surface visibility. The site does not appear to be eligible for nomination to the IRHSS or NRHP and, therefore, no further archaeological work is recommended.

12-Sj-432

UTM Coordinates: Zone 16, 561364 East, 4605569 North (NAD 83)
Cultural Period: Middle Woodland
Site Dimensions: 25 ft. (7.62 m) N/S by 25 ft. (7.62 m) E/W
Elevation: 865 ft. a.m.s.l.
Topographic Setting: Upland hilltop
Soil type: Riddles loam, 12-18% slopes, eroded (RtD2)
Nearest water source: Unnamed Glacial Lake
Distance to nearest water: 500 feet to the north-northwest
Surface visibility: 35%

Site 12-Sj-432 consists of a Middle Woodland lithic scatter found during a visual pedestrian reconnaissance in the SE ¼ of the NE ¼ of the NE ¼ of the SW ¼ of Section 2 (south and west grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Lakeville, Indiana quadrangle (Figure 56). The site is situated on an upland hilltop (Figure 59) and, at the time of the survey, was located in a harvested and well-weathered cornfield with 35% ground surface visibility. The soil type consisted of Riddles loam, 12-18% slopes, eroded (RtD2), which is a strongly sloping, deep, well-drained soil found on narrow, elongated ridgetops and knolls on till plains. Site size was determined by the artifact scatter to be approximately 25 ft. (7.62 m) N/S by 25 ft. (7.62 m) E/W. Artifacts recovered from the surface of the site consist of the following:

Count	Artifact Description	Weight
1	Middle Woodland, Lowe cluster projectile point (Burlington chert) (Figure 60)	3.3 g
1	retouched flake (Liston Creek chert)	5.2 g

Site 12-Sj-432 represents a small lithic scatter with a Middle Woodland point. No indications of further materials or subsurface features were found. The site is small and of limited significance beyond the diagnostic artifact. Therefore, it does not appear to be eligible for nomination to the IRHSS or NRHP and no further archaeological work is recommended.

12-Sj-26

This historic site was originally recorded during the survey for US 20 (Deutchman and Dorwin 1979:52) from which 8 stoneware fragments, 18 earthenware fragments, one earthenware toy lid, 28 glass fragments, one brick fragment, and two white clay pipe

Figure 59. View of Site 12-Sj-432 looking northwest.

Figure 60. Lowe cluster projectile point fragment from Site 12-Sj-432.

fragments were recovered. Site size was 100 ft. (30.48 m) N/S by 225 ft. (68.58 m) E/W. This previously recorded site is located in the NW ¼ of the NW ¼ of the NW ¼ of the SE ¼ of Section 2 (north and east grid alignment), Township 36 North, Range 2 East as shown on a portion of the USGS 7.5 minute series Lakeville, Indiana quadrangle (Figure 56). The site has been destroyed by the construction of an uncompleted access road and water line with hydrants (Figure 61) from existing US 31 to a new housing addition just east of the project.

Site 12-Sj-26 has been destroyed. It is not eligible for nomination to the IRHSS or NHRP and, therefore, no further archaeological work is recommended.

Figure 61. View of Site 12-Sj-26 looking west.

MODELING SUMMARY

Twenty new archaeological sites, 12-Mr-413 thru 419 and 12-Sj-420 thru 432, as well as three previously recorded archaeological sites, 12-Mr-308, 12-Mr-318, and 12-Sj-26 were discovered and evaluated for significance and potential inclusion to the IRHSS and the NRHP during the Phase Ia archaeological field reconnaissance. Of the nine (9) sites discovered within the portion of the project area in Marshall County, two (2) were prehistoric and seven (7) were historic (2 farmsteads and 5 historic artifact scatter/dump sites). In St. Joseph County of the fourteen (14) sites within the project area three (3) historic sites (1 farmstead, 2 historic artifact scatter/dump sites) and eleven prehistoric sites were found. All of the prehistoric sites yielded very little archaeological material

with only one (1) site providing a small amount of fire-cracked rock. Interestingly, all of the prehistoric diagnostic artifacts found except possibly one, dated to no earlier than the Late Archaic (ca. 3000 B.C.). The paucity of sites in this region of woodlands, wet and dry prairie, and marshlands was noted by Charles Faulkner (1961:12) during his early archaeological survey of Marshall County who wrote that "almost all the sites…are located on sand, or sandy loam". This proved to be a valid observation, as almost all the prehistoric sites discovered in this study were found on sandy soils, many sandy areas were small and not mapped on currently available soils data, but observed in the field. No historic Native American artifacts from the post-contact period (circa 1679 to 1840) were found within the project area; however, they have been noted within the immediate vicinity of the project. Dates from the historic Euro-American artifacts also reflected the late settlement of the area, the lands not being sold for settlement until extensive drainage was completed in the late nineteenth century.

In addition to the information provided above, modeling techniques developed by Richard Green and Jeffrey Plunkett of Landmark Archaeological and Environmental Services, Inc. for INDOT during the alternative selection process of the Evansville to Indianapolis I-69 corridor in 2003 were also utilized on this project to derive the following information.

Table 4. Breakdown of previously disturbed property, standing water, and remaining areas archaeologically surveyed within the project area (1011 acres).

Property Description	**# of acres**	**% of total**
Previously Disturbed Property (Road right-of-ways, residential, and commercial property)	431	42.63
Standing Water (Rivers, creeks, ponds, and wetlands)	7	0.69
Remaining Areas Archaeologically Surveyed - Visual Pedestrian Surface Survey - Shovel Probed	 458 115	 45.30 11.38

Table 5. Distribution of soils within the remaining areas archaeologically surveyed (573 acres) that have a high, medium, and low probability of containing archaeological sites.

Soil Classification	**# of acres**	**% of total**
High Probability Soils (Moderately well drained or better)	219	38.22
Medium Probability Soils (Somewhat poorly drained)	182	31.76
Low Probability Soils (Very poorly and poorly drained)	172	30.02

As can be seen in these tables, approximately 610 acres or 60.3% of the project area was found to be located on previously disturbed property, standing water, or on soils with a low probability for archaeological sites. That left only about 401 acres or 39.7% of

the project area on undisturbed property containing soils with a medium to high probability for archaeological sites.

In terms of the twenty-three (23) archaeological sites documented during this study; eighteen (18) were found on High Probability Soils, three (3) were found on Medium Probability Soils, and only two (2) were found on Low Probability Soils (both of which were historic artifact scatter/dump sites).

Using the twenty-one (21) archaeological sites that were found on High and Medium Probability Soils provides an archaeological site density on these soils of one site every 19.09 acres.

Using the eighteen (18) archaeological sites that were found only on High Probability Soils provides an archaeological site density on these soils of one site every 12.17 acres.

CONCLUSIONS AND RECOMMENDATIONS

Three previously recorded archaeological sites (12-Mr-308, 12-Mr-318, and 12-Sj-26) were resurveyed and twenty previously undocumented archaeological sites (12-Mr-413 to 419 and 12-Sj-420 to 432) were discovered during the Phase Ia field reconnaissance of the project area. The following recommendations are submitted as a result of the study:

State Site #	**Site Type**	**Recommendations**
12-Mr-308	Unknown Prehistoric	No further work is recommended
12-Mr-318	Unknown Prehistoric	No further work is recommended
12-Mr-413	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Mr-414	Prehistoric Isolate	No further work is recommended
12-Mr-415	Historic Artifact Scatter	No further work is recommended
12-Mr-416	Historic Farmstead	No further work is recommended
12-Mr-417	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Mr-418	Historic Farmstead	No further work is recommended
12-Mr-419	Prehistoric Isolate	No further work is recommended
12-Sj-26	Historic Farmstead	No further work is recommended
12-Sj-420	Prehistoric Isolate	No further work is recommended
12-Sj-421	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-422	Historic Artifact Scatter/Dump Site	No further work is recommended
12-Sj-423	Prehistoric Isolate	No further work is recommended
12-Sj-424	Historic Artifact Scatter/Dump Site	No further work is recommended

State Site #	Site Type	Recommendations
12-Sj-425	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-426	Prehistoric Isolate	No further work is recommended
12-Sj-427	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-428	Prehistoric Camp	No further work is recommended
12-Sj-429	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-430	Prehistoric Lithic Scatter	No further work is recommended
12-Sj-431	Prehistoric Isolate	No further work is recommended
12-Sj-432	Prehistoric Lithic Scatter	No further work is recommended

It is the opinion of this archaeologist, based on the results of the Phase Ia archaeological field reconnaissance and other available information, that the proposed project should have no effect on significant archaeological resources meeting the criteria established for inclusion to the IRHSS or the NRHP. Federal and State environmental provisions concerning the identification of archaeological resources have been accomplished and it is recommended that the project be allowed to proceed as planned. This is with the understanding that if human remains, features, or midden deposits are revealed during construction, all ground disturbing activities will cease, the IDNR, DHPA and INDOT will be contacted within two business days, and work will not resume in the area of the discovery until archaeological clearance is obtained.

This study was conducted in accordance with guidelines in "The Management of Archaeological Resources, The Airlie House Report" (McGimsey and Davis 1977) and revisions to the "Guidebook for Indiana Historic Sites and Structures Inventory-Archaeological Sites, 1989", issued by the IDNR, DHPA. The study is in compliance with recent amendments to the Indiana Historic Preservation Act (IC 14-21-1). All fieldwork, laboratory analysis, and report preparation have been performed or directly supervised by a Professional Archaeologist meeting the standards set forth by the U.S. Department of the Interior detailed in 36 CFR Part 61, and 66, and the Secretary of Interior's "Guidelines for Historic Preservation and Archaeology" (48 FR 44716).

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