Exhibit T, Petty North Historic Preservation Clearance

JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

CHARLES R. DAVIS
DEPUTY SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

May 22, 2015

Heidi R. Post
Report Production Manager
R. Christopher Goodwin & Associates, Inc.
309 Jefferson Highway, Suite A
New Orleans, Louisiana 70121

Re: Draft Report
LA Division of Archaeology Report No. 22-4932
Phase I Cultural Resources Investigation of the Denmon Petty Project in Ouachita Parish, Louisiana

Dear Ms. Post:

We acknowledge receipt of your letter dated 29 April 2015 and two copies of the above-referenced report. We have completed our review of this report and offer the following comments.

- The number of shovel tests mentioned on page 51 does not match what is depicted in Figure 7.8 on pages 52. Also, this figure does not match the draft site form that was submitted for review.
- Please show the shovel tests containing prehistoric material in figure 7.8.
- For future reference, please delineate sites at 10m intervals to two negative shovel tests. The potentially NRHP eligible portion of 16OU407 is missing tests to west; however, given the other negative tests for the site, it seems unlikely that the it would have expanded much further to the west.
- Please discuss the decision to remove a portion of the project area to accommodate the avoidance of site 16OU407.

We concur with the report findings that the prehistoric component of site 16OU407 Locus B-01 is potentially eligible for nomination to the National Register of Historic Places and that the rest of the site remains ineligible. We also concur that avoidance is recommended for the prehistoric component and if avoidance is not possible, further consultation with the Louisiana Division of Archaeology will be required.

We look forward to receiving two bound copies of the final report, along with a pdf of the report. If you have any questions, please contact Paul French in the Division of Archaeology by email at pfrench@crt.la.gov or by phone at 225-342-8166.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer
PB:phf

R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
LOUISIANA'S 2014 ARCHAEOLOGIST OF THE YEAR
cultural resource management and preservation planning

April 29, 2015

Ms. Pam Breaux
Louisiana Department of Culture, Recreation, and Tourism
Office of Cultural Development
Division of Archaeology
1051 N. 3rd St., Room 405
Baton Rouge, LA 70802

RE: Phase I Cultural Resources Investigation of the Denmon Petty Project in Ouachita Parish, Louisiana

Dear Ms. Breaux,

Enclosed, please find two copies of the above referenced draft report for your review and comment. If you have any questions or require additional copies, please don't hesitate to contact me at the New Orleans number below.

Sincerely,

Heidi R. Post, B.A.
Report Production Manager

309 Jefferson Highway, Suite A New Orleans, Louisiana 70121
(504) 837-1940 Fax (504) 837-1550 neworleans@rcgoodwin.com www.rcgoodwin.com
New Orleans, LA Frederick, MD Lawrence, KS Las Cruces, NM

DRAFT REPORT

APRIL 2015

PHASE I CULTURAL RESOURCES INVESTIGATION OF THE DENMON PETTY PROJECT IN OUACHITA PARISH, LOUISIANA

PREPARED FOR:

DENMON ENGINEERING
P.O. BOX 8460
MONROE, LA 71211

Sensitive Information: Not For Public Distribution

R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
309 JEFFERSON HIGHWAY, SUITE A ▪ NEW ORLEANS, LA 70121

PHASE I CULTURAL RESOURCES INVESTIGATION OF THE DENMON PETTY PROJECT IN OUACHITA PARISH, LOUISIANA

Dave D. Davis, Ph.D.
Co-Principal Investigator

Sean Coughlin, M.A., R.P.A.
Co-Principal Investigator

Draft Report

By

Ashley Sanders Hale, Ben Davis, Sabreina Slaughter,
Angelique Theriot, and Sean Coughlin

R. Christopher Goodwin & Associates, Inc.
309 Jefferson Highway, Suite A
New Orleans, LA 70121

April 2015

For

Denmon Engineering
P.O. Box 8460
Monroe, LA 71211

PHASE I CULTURAL RESOURCES INVESTIGATION OF THE DENMON PETTY PROJECT IN OUACHITA PARISH, LOUISIANA

Dave D. Davis, Ph.D.
Co-Principal Investigator

Sean Coughlin, M.A., R.P.A.
Co-Principal Investigator

Draft Report

By

Ashley Sanders Hale, Ben Davis, Sabreina Slaughter, Angelique Theriot, and Sean Coughlin

R. Christopher Goodwin & Associates, Inc.
309 Jefferson Highway, Suite A
New Orleans, LA 70121

April 2015

For

Denmon Engineering
P.O. Box 8460
Monroe, LA 71211

ABSTRACT

This report describes the results of Phase I cultural resources survey and archeological inventory of the proposed Denmon Petty Project in Ouachita Parish, Louisiana. The Denmon Petty Project entailed the examination of two parcels (Survey Areas A and B) that totaled 103.2 ha (255 ac). The current project areas are located to the east of the Ouachita River in Ouachita Parish, Louisiana and the two parcels are positioned east of the city of Monroe, along Hwy 594/Millhaven Road. Survey Area A measured approximately 40.1 ha (99 ac) and Survey Area B measured approximately 63.1 ha (156 ac).

This investigation was conducted on behalf of Denmon, in December of 2014, by R. Christopher Goodwin & Associates, Inc. This field effort was designed to identify and evaluate all cultural resources (e.g., archeological sites, isolated finds, cemeteries, and historic structures) situated within or immediately adjacent to the proposed project area that may be impacted adversely by proposed development. A total of 533 shovel tests were excavated within the proposed project parcels and a locus to an existing site and an isolated find were recorded as a result of this investigation. Both cultural resources were located within Survey Area B. A multiple component locus (Locus B-01) associated with existing Site 16OU407 and an isolated find (Isolated Find B-02). Isolated Find B-02 and the historic component of Locus B-01 (Site 16OU407) were assessed as not significant applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional testing or evaluation was recommended. The prehistoric component of Locus B-01 possesses research potential (potentially intact deposits) and avoidance is recommended, but if avoidance is not feasible, additional testing and evaluation of the site, applying the National Register of Historic Places Criteria for Evaluation is recommended for this component of Locus B-01 (Site 16OU407). No archeological sites or historic standing structures were identified within Survey Area A.

TABLE OF CONTENTS

LIST OF FIGURES

List of Tables

CHAPTER I

INTRODUCTION

This document describes the results of Phase I cultural resources investigation of the Denmon Petty Project in Ouachita Parish, Louisiana (Figures 1.1 and 1.2). This investigation was conducted on behalf of Denmon, in December of 2014, by R. Christopher Goodwin & Associates, Inc. (RCG&A) The objective of this archeological inventory was to identify and to evaluate all historic properties (i.e., archeological sites, cultural resources loci, standing structures, and/or cemeteries) that may be impacted adversely by the proposed project.

The Denmon Petty Project entailed examination of two parcels (Survey Areas A and B) that totaled 103.2 ha (255 ac). The current project areas are located to the east of the Ouachita River in Ouachita Parish, Louisiana and the two parcels are positioned east of the city of Monroe, along Hwy 594/Millhaven Road. (Figures 1.1 and 1.2). Survey Area A measured approximately 40.1 ha (99 ac) and Survey Area B measured approximately 63.1 ha (156 ac).

A multi-staged approach was used to complete this investigation. It consisted of a review of data relevant to the proposed project area and fieldwork, which included pedestrian survey, visual inspection, and systematic shovel testing. All fieldwork was conducted in accordance with procedures outlined in the National Historic Preservation Act of 1966, as amended; the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800); and "Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines" (48FR 44738). Additionally, this survey effort abided by the standards promulgated in *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983).

A total of 104.8 ha (259 ac) were surveyed during the course of this project. This archeological inventory included pedestrian survey, visual inspection, and systematic shovel testing throughout the limits of the proposed project items. A total of 533 shovel tests were excavated within the proposed project items. Two cultural resources were identified during the investigation of the proposed project items. Both cultural resources were located within Survey Area B. They were a multiple component locus (Locus B-01) associated with existing Site 16OU407 and an isolated find (Isolated Find B-02). No further work was recommended for Isolated Find B-02 or the historic component of Locus B-01 (Site 16OU407). Additional work or avoidance was recommended for the prehistoric component of Locus B-01 (Site 16OU407). No archeological sites or historic standing structures were identified within Survey Area A.

Project Personnel

Mr. Dave Davis, Ph.D., and Mr. Sean Coughlin, M.A., R.P.A., served as Co-Principal Investigators for this project. Mr. Coughlin also acted as Project Manager, and supervised the field effort. Mr. Peter Cropley, M.A., served as Project Archeologist. They were assisted in the field by Mr. Ben Davis, B.A., Ms. Leslie Clement, B.A., Ms. Genevieve Jones, B.A., Ms. Jordan Krummel, M.A.; and, Ms. Sabreina Slaughter B.A. The graphics presented in this document were completed by Mr. Craig Matthews, B.A., and Mr. David Stitcher, B.A. Ms. Heidi R. Post, B.A., produced this document.

Organization of the Report

An overview of the natural setting of the proposed project area is presented in Chapter II. Chapter III outlines the prehistory of the project area, while Chapter IV presents the historical context for the project area. The previous investigations and previously identified archeological sites

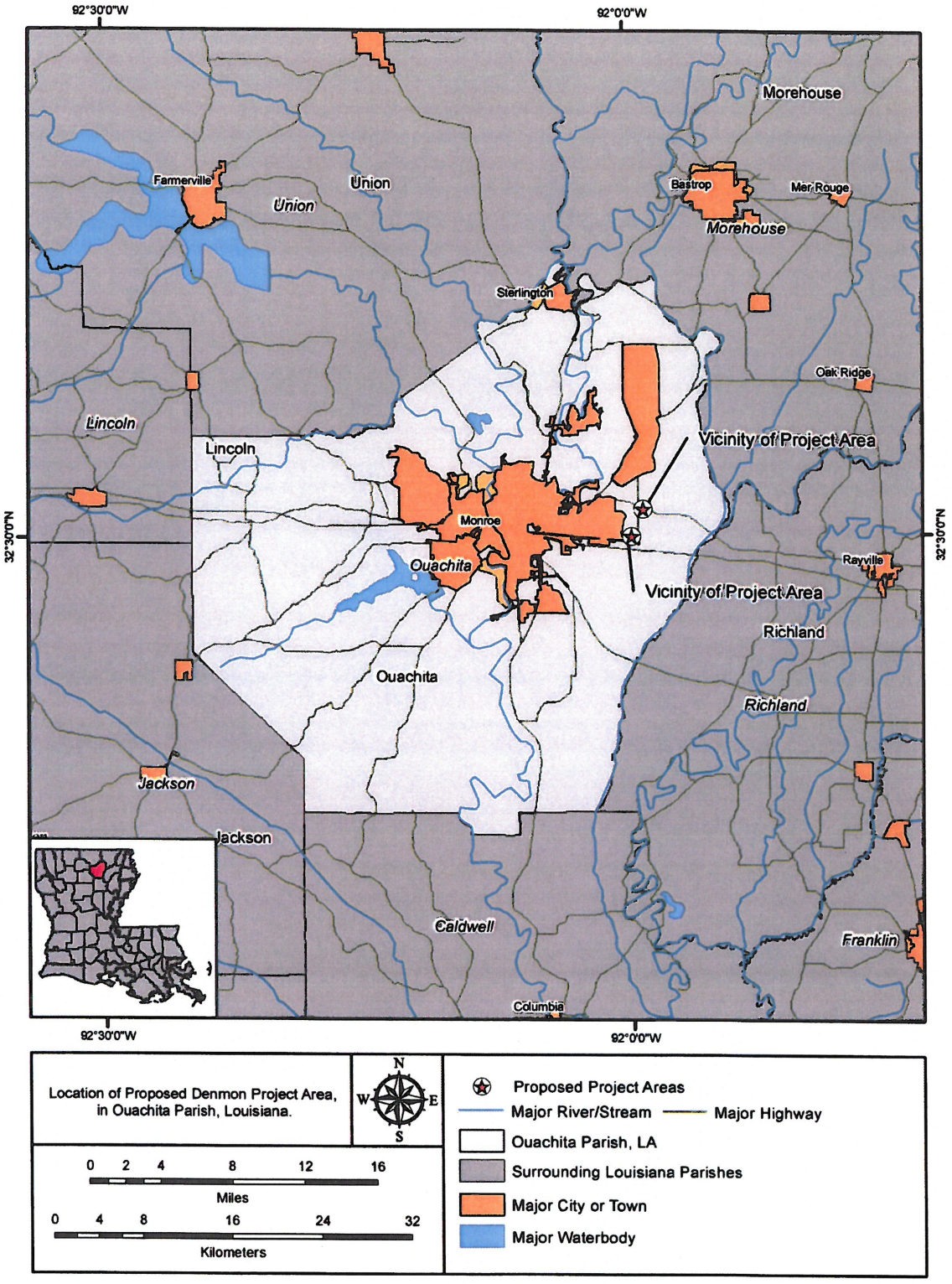

Figure 1.1. **Overview map showing the approximate location of the proposed project parcels within Ouachita Parish, Louisiana.**

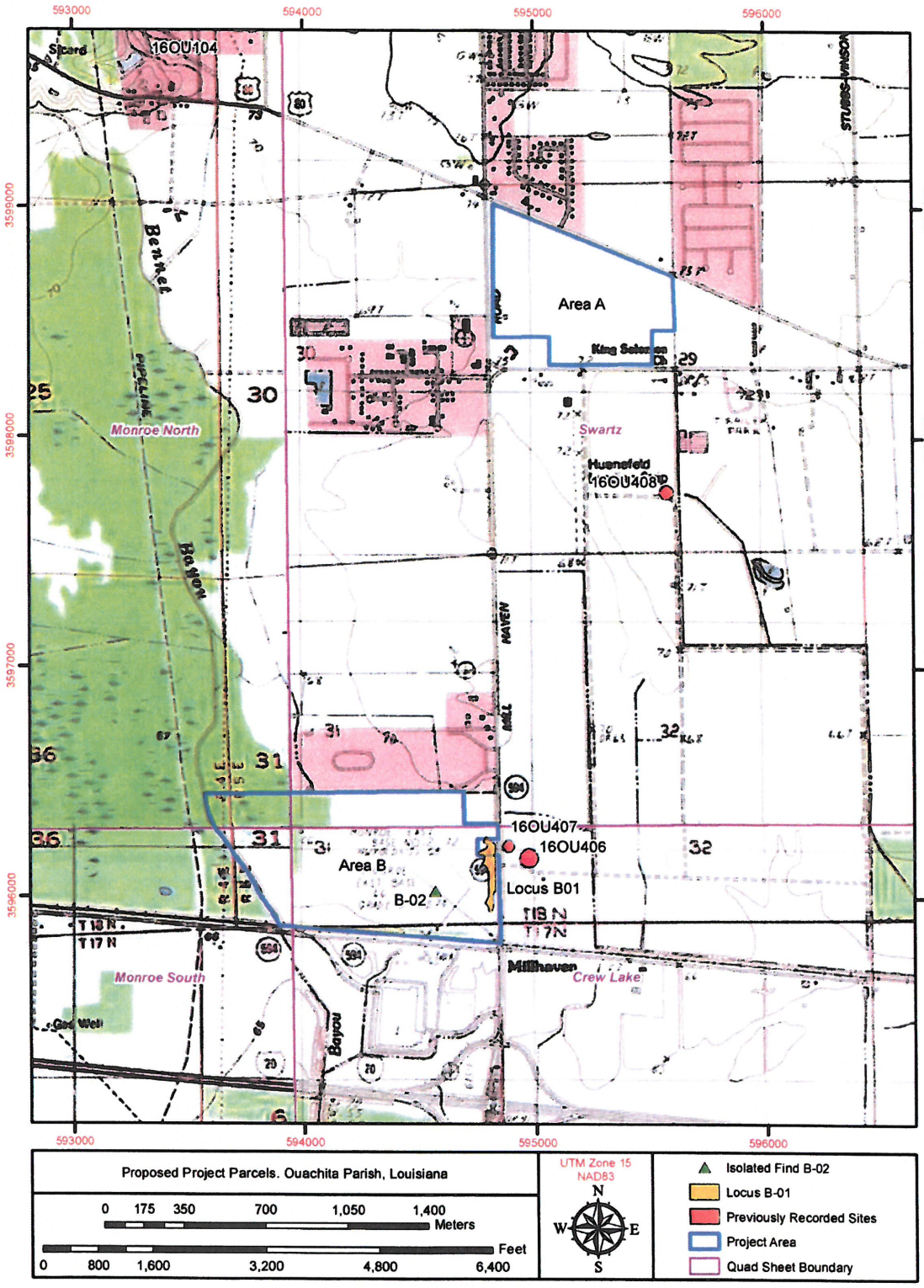

Figure 1.2. **An excerpt from the digital U.S. Geological Survey 7.5' Monroe, LA depicting the location of proposed project parcels within Ouachita Parish, Louisiana.**

within 1.6 km (1 mi) of the current project area are discussed in Chapter V. The research design and field methods utilized to execute this Phase I archeological inventory are presented in Chapter VI. The results and project recommendations are presented in Chapter VII.

Chapter II

Natural Setting

The current project areas are located to the east of the Ouachita River in Ouachita Parish, Louisiana. The two parcels are positioned east of the city of Monroe, along Hwy 594/Millhaven Road. Geologically, this region was created and influenced by a number of factors that varied widely throughout the area. These factors are identified and examined below in order to gain insight into how their distribution has influenced prehistoric and historic settlement patterning and subsistence strategies within this portion of Louisiana.

Various facets of the natural environment within the vicinity of the two parcels have worked to influence archeological site distribution throughout the area. In this chapter, a number of environmental variables and their importance to understanding the distribution of archeological sites throughout the area are considered. These variables include physiography, geology, soils, hydrology, geomorphology, flora, fauna, and climate; each of these items is discussed with specific reference to the region surrounding the current project area of the two parcels. Knowledge of these variables is critical to understanding prior land use by the prehistoric and historic cultures of the region.

The Ouachita River Valley and its tributaries have been affected by dynamic fluvial activity throughout the Pleistocene and Holocene eras. The active nature of the waterway has impacted settlement patterns throughout the region and, during both historic and modern times, numerous attempts have been made to manage and exploit the river through the construction of artificial control structures at various locations. The taphonomic processes associated with the archeological deposits in the valley must be understood in order to interpret site locations and integrity throughout the area. Many of the factors examined in this chapter provide insight into how this distribution has affected prehistoric and historic populations, their settlement patterns, and subsistence strategies.

While prehistoric and/or historic populations may adapt to specific geographical niches, it has been suggested that the local trends of larger cultural traditions often coincide with an adaptation to a particular ecological area (Jenkins and Krause 1986:18). A systematic understanding of the natural setting, therefore, is a useful aid for predicting archeological site locations and for understanding settlement patterns, as well as the possible functions, chronologies, and cultural affinities of the sites identified. For example, Johnson (1984:235) used such an approach when he noted that "when lithic resources are convenient to other resources being exploited in the subsistence system, a broader range of activity will have been performed at the quarry sites and there will have been a more permanent habitation." While a close consideration of the natural setting aids in creating predictive models, it is important to remember that such an approach only helps to indicate probabilities.

Physiography

The two project items lie within the meanderbelts and backswamps of the Arkansas/ Ouachita River, a portion of the Mississippi Alluvial Plain Physiographic Province. This province can be characterized as a broad region of low plain and delta system formed by the Mississippi River. Specifically, the Ouachita River Valley is located within the Tertiary uplands area of central and northwestern Louisiana.

Ouachita Parish is bisected by two physiographic regions: the Mississippi Alluvial Plain to the east and the West Gulf Coastal Plain to the west (Figure 2.1) (Wang 1952: 11). This division occurs along the north-south running longitude of Monroe, Louisiana. The West Gulf Coastal Plain consists of dissected tertiary uplands and

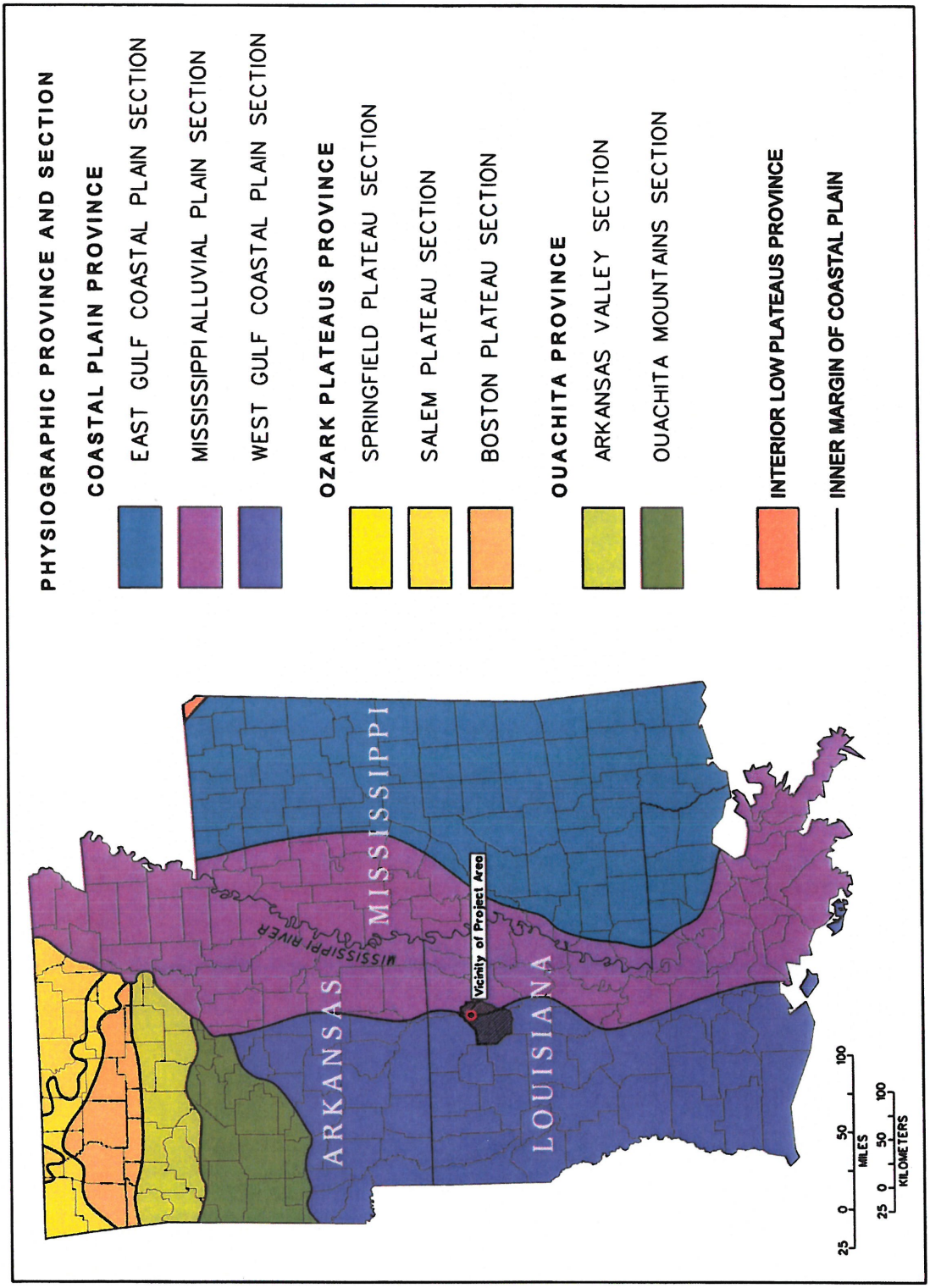

Figure 2.1. Map illustrating the physiographic regions of Louisiana.

undulating hills. Elevations throughout the area range from 23 m (75 ft), elevations common to the Ouachita River floodplain, to 98 m (320 ft) along the western border of Ouachita Parish. To the east of the Ouachita River is the Mississippi Alluvial Plain, a Quaternary and Holocene floodplain, that contains frequently flooded streams, shifting channels, natural levees, ox-bow lakes, meander scars, back swamps, and rim swamps (Saucier 1994:22). Elevations throughout the plain range from 11 m (35 ft) to 26 m (85 ft) with the majority of the area falling between 17 m (55 ft) and 21 m (70 ft). The project item lies within the Mississippi Alluvial Plain but any former occupants of the area would have had access to the resources available within the West Gulf Coastal Plain physiographic province.

Within the Mississippi Alluvial Plain, the project area is situated at the transition between two physiographic subdivisions: the Arkansas/ Ouachita River Holocene Meander Belts and the Arkansas/Ouachita River Backswamps. The Arkansas/Ouachita River Holocene Meander Belt physiographic subdivision is a floodplain that contains the past and present courses of the lower Arkansas and Ouachita rivers. The subdivision contains point bars, natural levees, swales, meander scars, and oxbow lakes, such as Horseshoe Lake. Alternatively, the Arkansas/Ouachita River Backswamps physiographic subdivision is characterized by flats, swales, and natural levees with swamps, oxbow lakes, ponds, and sloughs common to the area (Figure 2.2).

Soils

The soils found within the vicinity of the two survey items consists of Hebert soil series. This somewhat poorly drained soil occurs mainly along natural levees along the abandoned channels of the Ouachita and Mississippi River. This soil type is often used for pasture and cultivated crops. The water table associated with soils of this nature reaches a minimum depth of 46 cm to 91 cm (18 in – 36 in) for periods of around one month; typically in the spring or winter (USDA soil surveys).

A typical soil profile representative of the Hebert silt loam soil exhibits only two strata in profile. The upper most stratum is characterized as a deposit of dark grayish brown, slightly acid fine silt loam that extends from 0 to 25 cm (0 to 10 in). This is underlain by the subsoil, which consists, in its upper part of a light brownish gray, with strong brown mottles, very strongly acid loam. The lower part of the subsoil is described as a layer of reddish brown, mottled, very strongly acid fine clay loam; it extends to a depth of 94 cm (37 in) (USDA soil surveys).

Hydrology within the Vicinity of the Proposed Project

The Ouachita River, a major tributary of the Mississippi River, receives all the hydrological discharge from the region. Oxbow lakes, backswamps, and other swamps and wetlands are common within the alluvial valleys of major rivers and bayous in the region. Oxbow lakes are common in the area, especially along the Ouachita River north of Monroe. Since this section of the river is younger in age, the natural levees that would contain and channel the water have had less time to develop, thereby increasing the chances in the area for channels to be cut off, and for lakes to form.

Flora within the Project Region

In the Holocene alluvial valley of the Ouachita River and its tributaries, Oak-Gum-Cypress forests were widespread (Table 2.1) (Brown 1972; Brown and Kirkman 1990; Nelson and Zillgitt 1969; Thorne and Curry 1983). The Oak-Gum-Cypress forest consists of a mixed bottomland forest in which at least half of the overstory is composed of one or more of the following species (Nelson and Zillgitt 1969): the red oak group (pin oak [*Quercus palustris*], willow oak [*Quercus phellos*], nuttall oak [*Quercus texana*], water oak [*Quercus nigra*]); the white oak group (overcup oak [*Quercus lyrata*]); and blackgum (*Nyssa sylvatica*), and water tupelo (*Nyssa aquatica*).

Secondary components of the Oak-Gum-Cypress forest include: swamp red maple (*Acer rubrum* var. *drummondii*), green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), water-elm (*Planera aquatica*), swamp-privet (*Forestiera acuminata*), pumpkin ash (*Fraxinus profunda*), water hickory (*Carya aquatica*), and nutmeg hickory (*Carya myristi-*

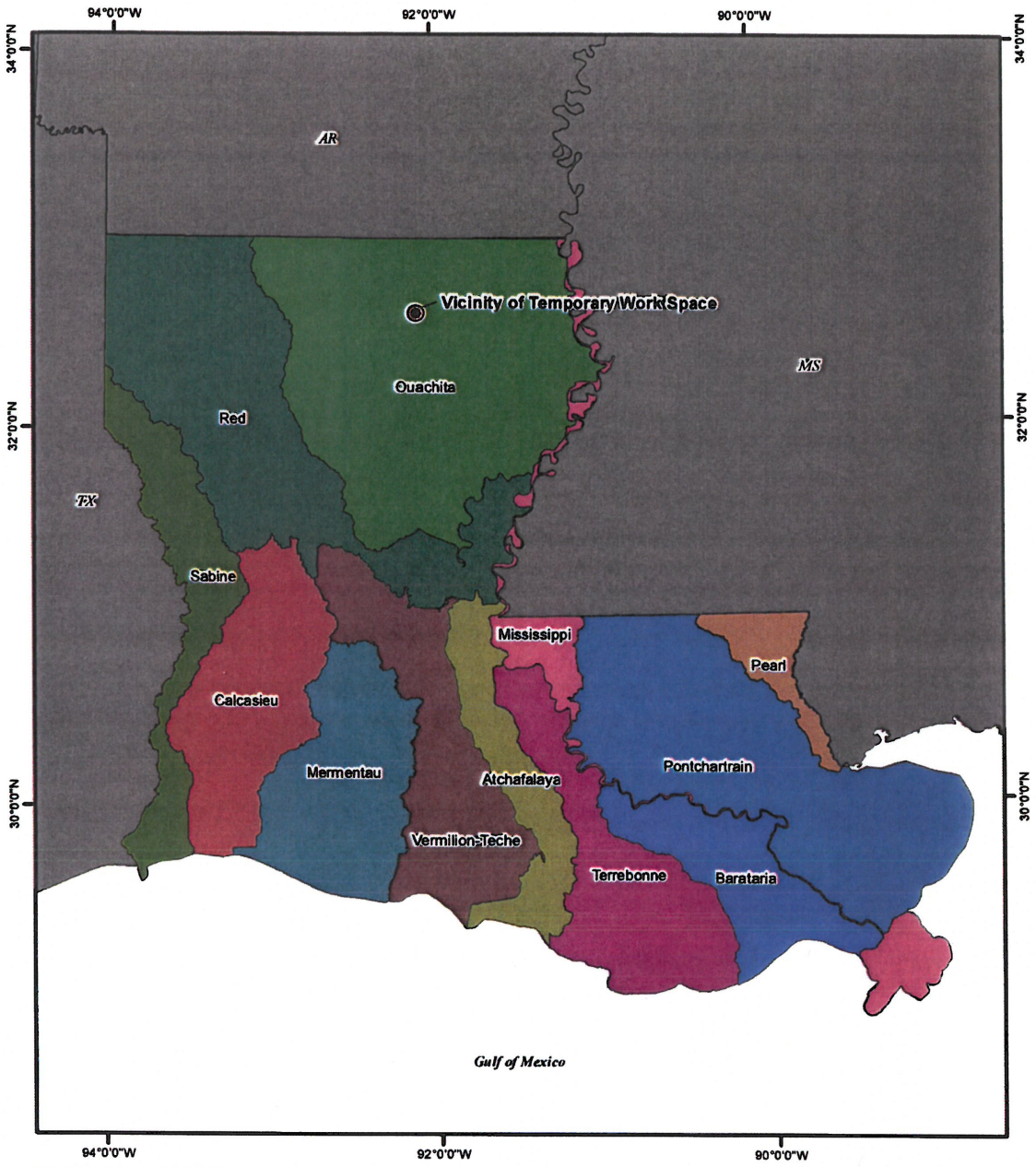

Figure 2.2 **Map illustrating the major river valleys of Louisiana.**

Table 2.1 Plants native to the project area.

COMMON NAME	LATIN NAME
Pin Oak	*Quercus palustris*
Willow Oak	*Quercus phellos*
Nuttall Oak	*Quercus texana*
Water Oak	*Quercus nigra*
Overcup Oak	*Quercus lyrata*
Blackgum	*Nyssa sylvatica*
Water Tupelo	*Nyssa aquatica*
Swamp Red Maple	*Acer rubrum* var. *drummondii*
Greem Ash	*Fraxinus pennsylvanica*
American Elm	*Ulmus americana*
Water-Elm	*Planera aquatica*
Swamp-Privet	*Forestiera acuminata*
Pumpkin Ash	*Fraxinus profunda*
Water Hickory	*Carya aquatica*
Nutmeg Hickory	*Carya myristicaeformis*
Cottonwood	*Populus deltoids*
Swamp Cottonwood	*Populus heterophylla*
Black Willow	*Salix nigra*
Hackberry	*Celtis occidentalis*
Honey Locust	*Gleditsia tricanthos*
Water Locust	*Gleditsia aquatica*
Palmetto	*Sabal minor*
Pecan	*Carya illinoensis*
Mayhaw	*Crataegus opaca*
Cane	*Arundenaria gigantean* and *Arundenaria tecta*
Fragrant Ladies Tresses	*Spiranthes odorata*
Swamp Lily	*Crinum americanum*
Pickerel-Weed	*Pontederia cordata*
Irises	*Iris* spp.
White Water Lily	*Nymphaea odorata*

caeformis). Of the six species named above, only the American elm has any economic importance. In the past, American elm wood was steamed and bent into forms to make barrel and wheel hoops, veneer, and baskets (Brown and Kirkman 1990:124). Southern pine species make up less than 25 percent of the total mix of species.

Species commonly associated with the Oak-Gum-Cypress forest include cottonwood (*Populus deltoids*), swamp cottonwood (*Populus heterophylla*), black willow (*Salix nigra*) hackberry (*Celtis occidentalis*), honey locust (*Gleditsia tricanthos*), water locust (*Gleditsia aquatica*), palmetto (*Sabal minor*), pecan (*Carya illinoensis*), and mayhaw (*Crataegus opaca*). Several of these species are important economically, but it is unlikely that any of them would occur in sufficient abundance to warrant systematic exploitation. The virgin forests may have contained huge sycamores that were harvested as they were discovered, while some of the species may have been collected for specific purposes. Honey and water locusts, for example, often were used in making fence posts or railroad ties, while black willow was used to produce wicker furniture.

The herbaceous species associated with Oak-Gum-Cypress forests are varied and composition is influenced by bottomland microhabi-

tats. Breaks in the forest cover would have contained large stands of cane (*Arundenaria gigantean* and *Arundenaria tecta*) (Thorne and Curry 1983). Early settlers grazed their hogs on young cane shoots, which resulted in the depletion of the cane breaks once found throughout the area. Cane also was an important source of raw material for basketry, fishing poles, and for cane bottomed chairs. Other herbaceous bottomland species probably were sporadically collected, but none of them had major economic importance at any given time. The rich subsistence potential of bottomland species are discussed more fully by King (1982:14-15) and Thorne and Curry (1983:49-72). Some of the more visually striking herbaceous species common in the bottomlands include: fragrant ladies tresses (*Spiranthes odorata*), swamp lily (*Crinum americanum*), pickerel-weed (*Pontederia cordata*), irises (*Iris* spp.) and white water lily (*Nymphaea odorata*) (Brown 1972).

Fauna within the Project Region

Northern Louisiana supports a wide variety of fish, mammal, and bird species (Gulf States Utilities Company 1974a, 1974b; Lowery 1974a, 1974b; Martin 1988; Thorne and Curry 1983). Important mammalian species inhabiting the area include white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), swamp rabbit (*Sylvilagus carolinensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), mink (*Mustela vison*), bobcat (*Felis catus*), coyote (*Canis latrans*), opossum (*Didelphus marsupialis*), otter (*Lutra anadensis*), nine-banded armadillo (*Dasypus novemcinctus*), and gray fox (*Urocyon cinereoargenteus*) (Table 2.2). Species that formerly inhabited the region include mountain lion (*Felis concolor*), black bear (*Ursus americanus*), and wolf (*Canis lupus*) (Kniffen and Hilliard 1988:86-92) (Table 2.3). Mink, raccoon, opossum, gray fox,

Table 2.2 Mammals native to the project area.

COMMON NAME	LATIN NAME
White-Tailed Deer	*Odocoileus virginianus*
Eastern Cottontail	*Sylvilagus floridanus*
Swamp Rabbit	*Sylvilagus carolinensis*
Raccoon	*Procyon lotor*
Striped Skunk	*Mephitis mephitis*
Gray Squirrel	*Sciurus carolinensis*
Fox Squirrel	*Sciurus niger*
Mink	*Mustela vison*
Bobcat	*Felis catus*
Coyote	*Canis latrans*
Opossum	*Didelphus marsupialis*
Otter	*Lutra anadensis*
Nine-Banded Armadillo	*Dasypus novemcinctus*
Gray Fox	*Urocyon cinereoargenteus*

Table 2.3 Mammals formerly native to the project area.

COMMON NAME	LATIN NAME
Mountain Lion	*Felis concolor*
Black Bear	*Ursus americanus*
Wolf	*Canis lupus*

and black bear may have been hunted for their furs, while venison probably was the largest terrestrial source of protein.

Numerous avian species were permanent, seasonal, or transient inhabitants of the bottomland or upland environments (Table 2.4). Avian species common to the area include mockingbird (*Mimus polygotos*), quail (*Colingus virginianus*), duck (*Anatidae* sp.), great egret (*Casmerodais albus*), black vulture (*Coragyps atratus*), red-shouldered hawk (*Buteo lineatus*), and green heron (*Butorides virescens*), while wild turkey (*Meleagris gallapavo*), wood duck (*Aix sponsa*), and passenger pigeon (*Ectopistes migratorius*) were a few of the major game species present. During the fall and spring migrations, a huge variety of migratory waterfowl also would have been available (Matthews et al. 1974).

Aquatic and semi-aquatic faunal resources were numerous and varied. Over 85 species of fish and over 20 species of reptiles and amphibians inhabit the Mississippi River and varied aquatic resources of the Mississippi bottomlands (Tables 2.5 and 2.6) (Conner 1977; Gulf States Utilities Company 1974a, 1974b; Thorne and Curry 1983). Some of the more important game fish include: large-mouth bass (*Micropterus salmoides*), white bass (*Morone chrysops*), yellow bass (*Morone mississippiensis*), carp (*Cyprinus carpio*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodistis olivaris*), bluegill (*Lepomis macrochirus*), white crappie (*Promoxis annularis*), freshwater drum (*Aplodinotus grunniens*), garfish (*Lepisosteus* spp.), sauger (*Stizostedoin canadensis*), shad (*Dorosoma* spp.), sucker (various genera of *Catostomidae*), and sunfish (*Lepomis microlaphus*). In addition, reptile species such as American alligators (*Alligator mississippiensis*), common snapping turtles (*Chelydra serpentina*), and alligator snapping turtles (*Macroclemys termmincki*) have been hunted for meat or sport. Other aquatic sources of protein include frogs, freshwater mussels, and backwater fish species.

The mammal and avian communities are inventoried more fully by G. H. Lowery in *The Mammals of Louisiana and its Adjacent Waters* and its companion volume *Louisiana Birds* (Lowery 1974a, 1974b). Information on fish as well as a species list can be found in *Freshwater Fishes of Louisiana* by N. H. Douglas (1974), while reptiles and amphibians are discussed in *Field Guide to Reptiles and Amphibians of Eastern and Central North America* (Conant 1975).

Climate within the Project Region

The north Louisiana climate is subtropical, with a mean average rainfall measuring about 128.27 cm (50.5 in) per year (Mathews et al. 1974). Winters usually are mild with an average of 44 days each year experiencing temperatures below freezing. Winter weather varies due to the variation in wind patterns with the southern winds bringing in warm, moist tropical air, while the northern winds bring cold, dry polar air. The mean daily minimum temperature during the winter months is 3.9° C (39° F). In Ouachita Parish, the summers are hot and humid with a fairly uniform temperature of 32.2° C (90° F). The summer average daily maximum temperature is 33.9° C (93° F).

Ouachita Parish experiences relatively high rainfall during the winter and spring, averaging 14 cm (5.5 in) monthly. Drier weather is more common during the summer and autumn, averaging 8 cm (3 in) monthly. Most rainfall occurs in the form of showers, but convective thunderstorms also occur and occasionally the remnants of tropical cyclones bring heavy rain to the region. Snowfall rarely accumulates in measurable quantities and hail is infrequent.

Table 2.4 Birds native to the study area.

COMMON NAME	LATIN NAME
Mockingbird	*Mimus polygotos*
Quail	*Colingus virginianus*
Duck	*Anatidae* sp.
Great Egret	*Casmerodais albus*
Black Vulture	*Coragyps atratus*
Red-Shouldered Hawk	*Buteo lineatus*
Green Heron	*Butorides virescens*
Wild Turkey	*Meleagris gallapavo*
Wood Duck	*Aix sponsa*
Passenger Pigeon	*Ectopistes migratorius*

Table 2.5 Fish and crustaceans native to the study area.

COMMON NAME	LATIN NAME
Large-Mouth Bass	*Micropterus salmoides*
White Bass	*Morone chrysops*
Yellow Bass	*Morone mississippiensis*
Carp	*Cyprinus carpio*
Blue Catfish	*Ictalurus furcatus*
Channel Catfish	*Ictalurus punctatus*
Flathead Catfish	*Pylodistis olivaris*
Bluegill	*Lepomis macrochirus*
White Crappie	*Promoxis annularis*
Freshwater Drum	*Aplodinotus grunniens*
Garfish	*Lepisosteus* spp.
Sauger	*Stizostedoin canadensis*
Shads	*Dorosoma* spp.
Suckers	various genera of *Catostomidae*
Sunfish	*Lepomis microlaphus*

Table 2.6 Reptiles and amphibians native to the study area.

COMMON NAME	LATIN NAME
American Alligators	*Alligator mississippiensis*
Common Snapping Turtles	*Chelydra serpentina*
Alligator Snapping Turtles	*Macroclemys termmincki*

Chapter III

Prehistoric Setting

Introduction

The area encompassing the proposed project parcels is characterized by a rich and varied prehistoric cultural tradition. This tradition began with the arrival of the first humans during the Paleo-Indian period and ends with the initiation of European contact in the mid-sixteenth century. Louisiana's Comprehensive Archaeological Plan (Smith et al. 1983) indicates that the proposed project area is located within Management Unit II. This unit encompasses the northeastern quarter of Louisiana, and it contains 15 Louisiana parishes: Caldwell, Catahoula, Concordia, East Carroll, Franklin, Jackson, La Salle, Lincoln Madison, Morehouse, Ouachita, Richland, Tensas, Union, and West Carroll. Management Unit II includes 2,304,676.7 ha (5,200,585 ac) of land, or roughly 14 percent of the State of Louisiana. A total of nine prehistoric cultural units are used to describe the prehistoric and protohistoric sequence of Management Unit II. These include Paleo-Indian, Archaic, Poverty Point, Tchefuncte/ Tchula, Marksville, Troyville (Baytown), Coles Creek, Plaquemine, and Caddoan (Giraud 1998; Jeter et al. 1989; Smith et al. 1983). Each of these units are described in detail below.

Paleo-Indian Stage (ca. 10,000 - 8000 B.C.)

Initial human occupation of the southeastern United States generally is believed to have occurred sometime between 10,000 and 12,000 years ago. Paleo-Indian sites are characterized by a distinctive assemblage of lithic tools, including fluted and unfluted lanceolate projectile points/ knives, unifacial end and side scrapers, gravers, and spokeshaves. The earliest Paleo-Indian culture identified in North America is named "Clovis," after the type-site in New Mexico. In the western United States, Clovis sites appear to fall within a relatively narrow time span, ranging from 11,500 to 10,900 B.P. (9950 - 8950 B.C.) (Haynes 1991; Story et al. 1990:178). While the evidence for earlier "pre-Clovis" or "pre-projectile point" occupations continues to be debated (Chrisman et al. 1996), no earlier sites have been documented convincingly in North America, and most researchers continue to remain skeptical about the presence of "pre-Clovis" cultures (Meltzer 1989; Whitley and Dorn 1993). The lithic tool assemblage of the Clovis culture and the later Folsom culture of the Great Plains and Southern Plains, generally is referred to as the Llano complex. The smaller, fluted Folsom projectile points/ knives occur in contexts that have been dated by radiocarbon from ca. 11,000 - 10,000 B.P. (9050 - 8050 B.C.) (Largent et al. 1991:323-332; Story et al. 1990:189).

Paleo-Indian culture generally is thought to consist of highly mobile hunter-gatherers, organized in small bands or extended family groups. In the Southeast, the formerly prevalent notion that Paleo-Indian populations were specialized big game hunters seems less tenable as more information becomes available from Paleo-Indian sites throughout the region. While sufficient evidence exists for the exploitation of large mammals (mega-fauna) including mammoth, mastodon, bison, caribou, and elk at sites in the western and northern United States, kill sites are rare in the Southeast. The paucity of kill sites in the Southeast suggests that big game hunting may not represent the dominant adaptive strategy in this area. The occurrence of Clovis-like fluted projectile points/knives in the southeastern United States is thought to reflect contemporaneity with Clovis cultures recorded in the western and northern parts of the country; however the regional environmental differences that existed between the West and the Southeast probably affected the availability of big game species in the area containing Site 16CA106.

Although there are few data upon which to reconstruct Paleo-Indian subsistence, it is believed to have encompassed a broad spectrum of resources, including fish, fowl, deer, small mammals, nuts, and gathered plants (Smith 1986:9-10; Steponaitis 1986:369; Walthall 1980:36). The exception to this generalized subsistence system may have been the Folsom culture. Folsom artifacts have been associated consistently with bison kill sites on the Great Plains. The lack of faunal evidence in association with Folsom finds in east Texas and Louisiana is due mainly to the highly acidic nature of the soils and the moist climate. The inferior preservation, however, precludes insights into the subsistence strategies characteristic of these areas. Folsom culture may represent an adaptation to a specialized hunting strategy associated with the cyclical migration of large herds of bison (Story et al. 1990:189). In addition, excavation of the Kimmswick Site (23JE334) in southeastern Missouri resulted in the recovery of Clovis projectile points in direct association with disarticulated mastodon bones, suggesting that southeastern Paleo-Indian populations did exploit large Pleistocene mammals at least occasionally (Graham et al. 1981).

Only a few stratified Paleo-Indian sites have been excavated in northern Louisiana. One such site, the Eagle Hill II Site (16SA8) reported by Gunn and Brown (1982:233), exhibits characteristics of a Texas variant of Folsom culture that is well documented throughout the Plains and the Southwest. A single Folsom-like projectile point was recovered from the late Pleistocene component of Site 16SA8; it was found in association with a suite of other tools, including side and end scrapers, gravers, and burins (Gunn and Brown 1982:230). The excavators concluded that the small size of the tools recovered from the site area and the dominance of unifacial retouch in the lithic assemblage, suggests origins affiliated with the Paleo-Indian tradition of the Plains, rather than with the eastern woodland Paleo-Indian tradition. The latter is characterized by more robust bifacial tools (Gunn and Brown 1982:343).

Prior to the Transitional Paleo-Indian/Early Archaic period, the Plano culture developed throughout the area extending from Louisiana to Wyoming. The Plano culture continued the tradition of hunting bison that began with the Folsom culture, but the associated tool kits changed (Gunn and Kerr 1984:205-207). Small, fluted Folsom projectile points and beaked scrapers were replaced by large, collateral flaked, stemmed and lanceolate projectile points; beveled knives; and transverse end scrapers. Temporally, diagnostic artifacts of the Plano culture include Agate Basin, Angostura, Scottsbluff (previously called Yuma points), and Eden projectile point types, as well as Cody knives.

In east Texas and Louisiana, the Plano complex also is represented by unfluted lanceolate Plainview, Firstview, Hell Gap, and Angostura projectile points/knives. These types first were thought to represent unfluted variants of the Clovis type; however, radiocarbon dating suggests a later temporal affiliation. Current data suggest that the Plano complex ranges in time from 10,100 to 8000 B.P. (8150 - 6050 B.C.) (Turner and Hester 1985:66, 141). Plano-type artifacts have been found throughout Louisiana (Cantley and Kern 1984; Hillman 1990:206-207).

In particular, a concentration of Plano points has been found in the uplands of west-central and northwest Louisiana, i.e., between the Red and Sabine Rivers and in adjacent areas in Texas (Gunn and Kerr 1984:220-221; Story et al. 1990:205-210). In addition, Hillman (1990:207) recovered six Scottsbluff projectile points from Macon Ridge in northeast Louisiana. Plano artifacts, however, are considered to be rare east of the Mississippi River. Instead, they tend to be restricted to the Plains and woodland fringes, and to date, no *in situ* Plano site has been excavated in Louisiana.

Near the end of the Pleistocene epoch, environmental changes contributed to the extinction of Pleistocene megafauna in the area. As a result, subsistence strategies and settlement patterns throughout the region became more localized. In contrast to the preceding period, lithic tools often were manufactured from local raw materials (Neuman 1984:69-70). At this time, a new technological complex (San Patrice) developed throughout northwestern Louisiana, eastern Texas, and southern Arkansas (Webb et al. 1971:46). San Patrice sites date from ca. 8000 to 6000 B.C. and they are considered to fall into the Late or

Transitional Paleo-Indian period. The San Patrice Complex first was defined on the basis of projectile point types (one lanceolate, the other side-notched) recovered in DeSoto Parish, Louisiana (Webb 1946). Although the dating of San Patrice might suggest a culture ascribed to the Early Archaic period, archeological investigations at the John Pearce Site (16CD56), in Caddo Parish, produced evidence of an essentially Paleo-Indian lifestyle. The predominance of local raw materials used in the manufacture of tools suggests that these groups adapted to the local environment and employed only limited mobility in procuring resources. Artifacts recovered from the site area included lanceolate and side-notched projectile points, as well as unifacial stone tools such as "end-scrapers, side-scrapers, side notched scrapers, gravers, borers, notched flakes, denticulates, burins, scaled pieces, retouched flakes and varia, made from thin flakes and, occasionally, blades" (Webb et al. 1971:11-33). The San Patrice Complex will be discussed in more detail below in reference to the Early Archaic, as it appears to represent a cultural transition to the Paleo-Indian and Early Archaic periods.

Archaic Stage (8000 - 500 B.C.)

Archaic cultures are defined as post-Pleistocene, preceramic cultures. The Archaic stage is an important period of time in the cultural sequence of Louisiana. At this time, Archaic peoples successfully adapted to a changing climate and to shifting resource patterns (Willey and Phillips 1958). Throughout this era, subsistence strategies became more specialized and localized, mobility appears to have decreased, and cultural traditions became more distinct regionally (Brain 1971; Caldwell 1958; Haag 1971; Muller 1978, 1983). As discussed below, the Archaic traditionally has been separated into three subdivisions: Early Archaic, ca. 7000 - 6000 B.C.; Middle Archaic, ca. 6000 - 4000 B.C.; and Late Archaic, ca. 4000 - 500 B.C.

Early Archaic Period (8050 to 6050 B.C.)

Throughout the Southeast, the Early Archaic period dates from ca. 8050 to 6050 B.C.; however, because of regional variation and temporal overlapping of stages, the assignment of Late Paleo-Indian and Early Archaic period artifacts to correct temporal stages is difficult. For example, Dalton projectile points/knives temporally succeeded Clovis projectile points and have been dated from 8550 to 7950 B.C. in Arkansas and Missouri (Goodyear 1982:382). At the Stanfield-Worley Bluff Shelter (1CT125) in northwestern Alabama, the Dalton zone dates from ca. 7750 to 7050 B.C. (DeJarnette et al. 1962; Griffin 1974). Dalton projectile points also have been recovered from Horizon 11 at the Koster Site (11GE4) in southern Illinois, which dates from 6750 to 6500 B.C. This date suggests that Dalton points/knives may extend later in time than presumed initially. At some sites, these points have been recovered with bifacially chipped stone adzes that may represent woodworking tools. Chipped and ground stone celts, probably the functional equivalent of Dalton adzes, have been recovered from the Kirk Horizon in Zone 16 at the St. Albans Site (46WV27) and from Early Archaic sites in the Little Tennessee River Valley (Smith 1986:14). In Louisiana, the distribution of Dalton projectile points/knives, and other artifacts associated with the Dalton culture, generally is restricted to the northern part of the state.

In addition, some of the earliest recognized Terminal Paleo-Indian/Early Archaic projectile point/knife types identified in Louisiana are the San Patrice, Keithville, and Pelican forms (Webb et al. 1971). Previously ascribed to the area encompassing northwest Louisiana, northeast Texas, and southwest Arkansas, later investigations have extended the geographic range of San Patrice to include an area from central Texas to southwest Alabama, and from southern Louisiana to central Arkansas (Williams and Brain 1983:32; Cantley and Kern 1984; Giliberti 1995, personal communication).

As mentioned in the previous section of this chapter, the San Patrice culture, previously discussed in reference to the terminal Paleo-Indian stage, is believed to represent a local adaptation of hunter/gatherers within restricted ranges. A hallmark of San Patrice is the almost exclusive use of local lithic materials for the production of tools. Tool assemblages include San Patrice and Keithville projectile points/knives, hafted scrapers, Albany side scrapers, unifacial scrapers, bu-

rins, and engravers (Webb et al. 1971). Initially, the San Patrice projectile point/knife type consisted of varieties *Hope* and *St. John*, but more recently other varieties have been added to the assemblage in Louisiana, Mississippi, and Alabama (Williams and Brain 1983; Giliberti 1995, personal communication). On Maçon Ridge, Hillman (1985) reported that in addition to the *Hope* and *St. John* varieties, the San Patrice projectile point/knife variety (var.) *Keithville* also was present. More recently, archeological investigations in the western part of the state at Fort Polk have produced a number of San Patrice projectile point/knives of differing types, including one that contained a combination of Dalton/San Patrice/Holland affinities (Largent et al. 1992; Williams et al. 1995). Reliable radiocarbon dates for these types are virtually non-existent; however, estimates, based on morphology and stratigraphic placement, range from ca. 8050 to 6050 B.C. (Story et al. 1990:202; Turner and Hester 1985:147; Webb 1981; Williams and Brain 1983:25). Ensor (1986) suggests that the San Patrice projectile point/knife type, and related forms in the Southeast, may have developed from the earlier Dalton projectile point/knife forms. Story et al. (1990:197), however, suggest that both Dalton and San Patrice types evolved independently from the earlier fluted point traditions.

Throughout the Early Archaic, the subsistence pattern probably resembled that of the preceding Paleo-Indian stage. Early Archaic peoples traveled seasonally in small groups between a series of base camps and extractive sites hunting deer and collecting edible plants (Chapman and Shea 1981; Lentz 1986; Parmalee 1962; Parmalee et al. 1976).

Tools associated with food processing, including manos, milling stones, and nutting stones, first appear in Early Archaic period sites. Commonly utilized plant foods, such as walnuts, hickory nuts, and acorns, could be hulled and eaten without cooking or additional processing (Larson 1980). Herbaceous seeds, which became an important food source during the end of the Archaic stage, generally were absent during the Early Archaic (Chapman 1977; Lentz 1986). While living floors associated with hearths, shallow pit features, and milling tools are known from Early and Middle Archaic contexts, there is little evidence of below-ground food storage or of substantial structures (Steponaitis 1986:371).

Much of the archeological knowledge regarding Paleo-Indian and Archaic lifeways is limited by problems of preservation. Lithic tools often are the only artifacts to survive; however, they provide only limited information about a narrow range of activities (i.e., manufacture and maintenance of tools, processing of meat and hides, and working of wood and bone). Although they rarely are preserved in the archeological record, clothing, baskets, and other artifacts made of perishable materials such as bone, wood, antler, shell, hair, hide, plant fiber, and feathers undoubtedly were an important part of the Archaic cultural tradition. Impressions of woven mats and net bags, preserved in fired clay hearths from Kirk strata at the Icehouse Bottom Site (40MR23) in Tennessee, provide rare insight into the richness of the Early Archaic material culture (Chapman and Adavasio 1977).

The Early Archaic cultures immediately preceding San Patrice are understood poorly in Louisiana. To date, temporally diagnostic projectile points/knives dating from the Early Archaic period, including Cache River, Calf Creek, Kirk, and Palmer, have been recovered only from questionable contexts and in limited numbers. Large Early Archaic sites, such as those identified in Florida, Georgia, Alabama, Tennessee, the Carolinas, and Texas have yet to be recorded in Louisiana. This undoubtedly is related to the dynamic alluvial nature of much of the state of Louisiana.

Middle Archaic Period (6000 - 4000 B.C.)

The Middle Archaic period throughout the southeastern United States is marked by several technological advances in addition to changes in subsistence patterns. Middle Archaic projectile points tend to be stemmed rather than notched, and they include such types as Eva, Morrow Mountain, Sykes, Benton, and Newnan. Other technological innovations include the appearance of ground, pecked, and polished stone tools and the use of celts and grooved axes for heavy woodworking, such as for dugout canoe manufacture. The atlatl, or spear thrower, first appeared during the Middle Archaic, as indicated by bone atlatl

hooks and by the appearance of ground stone bannerstones. In Louisiana, the Middle Archaic is represented by projectile points/knives that include Morrow Mountain, Johnson, Edgewood, and possibly Calcasieu types (Campbell et al. 1990:96; Green 1991; Perino 1985:195). Increasing population during the Middle Archaic also may have led to more circumscribed territories, which is evidenced by the repeated occupation of some locations, as well as the increased emphasis on locally available raw materials utilized in stone tool manufacture.

A total of two types of settlement patterns have been associated with the Middle Archaic: a centrally based wandering pattern with both base and satellite camps, and a restricted wandering pattern. In the former, the central base camp was occupied for both subsistence and maintenance activities, while satellite sites were occupied for resource procurement. In the restricted wandering pattern, group movement shifted from one locale to the next as resources became available. In addition to new settlement patterns, population estimates for the Middle Archaic show an increase over previous levels (Muller 1983). For example, floodplain sites which appear to have been occupied longer by greater numbers of people, frequently contain thick midden deposits representing semi-permanent or permanent habitations. Small special-activity sites generally are located on the floodplains, on terraces, and in upland settings along tributary streams. These sites probably were chosen for their proximity to selected exploitable resources, including game, nuts, and lithic materials (Campbell et al. 1990:98; Cantley et al. 1993:251-252).

The widespread occurrence of plant processing tools such as milling slabs, manos, and nutting stones suggests an increase in the utilization of plant foods. However, comparisons of floral and faunal assemblages from the Early Archaic and Middle Archaic deposit little change in the diversity or relative importance of species utilized. The Middle Archaic rough milling tools used in plant processing have Early Archaic antecedents (Smith 1986:21). Acorns and hickory nuts continued to be the dominant plant foods. Remains of *Curcurbita* (squash) and bottle gourds appear for the first time during the Middle Archaic. The earliest occurrence of the bottle gourd (*Lagenaria siceraria*) dates from 5340 ± 120 radiocarbon years B.C. at the Windover Site (8BR246) in Florida (Doran et al. 1990). "Squash" rind dating from 5050 B.C. from the Napoleon Hollow (11PK500) and Koster (11GE4) sites in west-central Illinois initially identified as the cultivar *C. pepo*, now is thought to be representative of the Texas wild gourd (*C. texana*), rather than cultivated squash. Although the seeds of these plants are edible, it appears that their rinds were thin, woody, and inedible; these gourds probably were collected primarily for use as containers rather than as sources of food. Stronger evidence for the domestication of squash gourds occurs after 2350 B.C., i.e., during the Late Archaic (Smith 1987).

In many areas, a major exception to the apparent continuity of earlier subsistence practices was a significant increase in the utilization of fish and shellfish. The rising importance of aquatic resources can be seen in the development of extensive shell middens found along many southeastern rivers. Shell middens first appear between 4550 and 4050 B.C. during the Hypsithermal (Altithermal) climatic episode, when rivers entered a phase of aggradation and low flow. This change promoted the development of oxbow lakes and shallow water shoal habitats favorable for mollusk growth and shellfish collection (Stein 1982). Although the food value of mollusks is low, they can be collected efficiently in bulk and they appear to have represented the economic focus for semi-sedentary Archaic stage occupations for many parts of the southeastern United States (Russo et al. 1992).

In the Southeast, recovery of human burials from Middle Archaic period sites is rare. Human interments appear to have increased during the Middle Archaic, but this may be the result of better preservation conditions. For example, submerged sites, such as Windover in Florida, have added substantially to our understanding of these semi-mobile cultures (Doran and Dickel 1988). Investigations of wet burials have found that grave goods were present in most burials, but many of these items consisted of delicate basketry, bone, leather, and plant materials that normally would not have been preserved at dry sites.