Appendix G

CULTURAL RESOURCES

U.S. Army Corps of Engineers
New Orleans District

PHASE I CULTURAL RESOURCES SURVEY OF AREAS TO BE AFFECTED BY THE HOUMA NAVIGATION CANAL DEEPENING PROJECT TERREBONNE PARISH, LOUISIANA

FINAL REPORT

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Submitted by
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1260 Main Street
Baton Rouge, Louisiana 70802

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PHASE I CULTURAL RESOURCES SURVEY OF AREAS TO BE AFFECTED BY THE HOUMA NAVIGATION CANAL DEEPENING PROJECT TERREBONNE PARISH, LOUISIANA

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ABSTRACT

Between October 2007 and February 2008, Coastal Environments, Inc. (CEI), conducted a cultural resources survey for the U.S. Army Corps of Engineers (COE), New Orleans District of areas to be affected by the Houma Navigation Canal (HNC) Deepening Project, in Terrebonne Parish, Louisiana. These investigations are part of the planning to evaluate several alternatives to deepening the HNC from the authorized 15-foot depth to an 18- or 23-foot depth while maintaining the existing canal width. The Area of Potential Effects (APE) for the project includes approximately 4970 acres of the canal and navigation channel, 516 acres of Bayou Grand Caillou, and 23,263 acres of dredge material disposal areas for a total of 28,749 acres.

Four previously recorded archaeological sites and 12 newly recorded sites were examined during the survey. One of the previously recorded sites, 16TR72, and one of the new sites, 16TR322, are located out side of the project's Area of Potential Effects and were not evaluated. They will not be affected by the proposed project. The remaining sites are not considered eligible for the National Register of Historic Places.

Remote sensing surveys were conducted in five areas that will be affected by the project: 1. Offshore Survey Area 1 (SPD MI. - 1.7); 2. Offshore Survey Area 2 (SPD MI. – 2.5); 3. the Isle Derniere Survey Area, 4. the Timbalier Island Survey Area, and 5. the Bayou Grand Caillou Survey Area. Two anomalies were located in each of the two Offshore Survey Areas, but none of them are considered likely to be related to cultural resources. Survey of the Isle Derniere Area located five pipelines and three individual anomalies. One of the latter, M007, is related to an oil and gas well, and the other two are more likely to be associated with oil and gas exploration than shipwrecks, therefore no further work is recommended for these. Survey of the Timbalier Island Area identified 32 pipelines and two individual anomalies, but neither of the latter are considered likely to represent cultural resources. Finally, survey of the Bayou Grand Caillou Area recorded a great number of individual magnetic anomalies and side scan sonar targets most of which can be related to crab traps or small objects, such as pieces of pipe or metal drums. Only two anomalies, magnetic anomaly MS04 and side scan sonar target SSN01, are considered to be potentially associated with cultural resources. In addition to these two target locations, the area along the western bank of Bayou Grand Caillou just below Mound Bayou is considered a sensitive area relative to historic properties. A Civil War earthwork, Fort Quitman, was located in this area, and studies from other waterways in south Louisiana show that old and decrepit boats are often abandoned near settlements and docking areas where they eventually deteriorate and become submerged and/or buried. The land portion of this area was not surveyed as it fell outside of the Area of Potential Effects for the proposed dredging. The proposed improvements to Bayou Grand Caillou have now been dropped from the Houma Navigation Canal Deepening Project and these areas will not be affected by the project.

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The archaeological survey was directed by David B. Kelley and Richard A. Weinstein. Michael Carpenter provided assistance during the bankline survey of the HNC, and Richard Greig, Spenser Varnado, Walker Wilson, and Henry Hanna drove the boats and airboats. Joanne Ryan conducted much of the background research on the region. Benji Guempel and Christy Duthu produced the maps.

CHAPTER 1

INTRODUCTION

This report presents the results of cultural resources investigations undertaken at several terrestrial and marine locations relative to the planned improvements to be undertaken by the New Orleans District U.S. Army Corps of Engineers (CEMVN), relative to the Houma Navigation Canal (HNC) Deepening Project, Terrebonne Parish, Louisiana. The HNC Project is a complex endeavor that will include deepening of the extant Houma Navigation Canal and a section of Bayou Grand Caillou, which will involve the use of borrow and disposal areas, as well as marsh restoration and shoreline protection efforts at the offshore barrier islands of Isle Derniere (sometimes called East Island and the easternmost of a group of islands known as the Isles Dernieres) and Timbalier at the entrance to Terrebonne Bay. The principal objective of these investigations was to locate and evaluate cultural resources that might be affected by the proposed project. The overall cultural resources effort undertaken for the HNC Deepening Project involved an extensive amount of terrestrial survey of upland construction and disposal areas and Phase I remote-sensing surveys of portions of Bayou Grand Caillou as well as areas in Terrebonne Bay where marsh restoration and shoreline protection efforts are planned. These field investigations, carried out between October 2007 and February 2008, were supplemented with background research on the history, archaeology and geology of the project area.

Background of the HNC Deepening Project

The Houma Navigation Canal is a federally maintained waterway beginning at the Gulf Intracoastal Waterway at Houma, Louisiana, and ending about 66 km (41 mi) south of Houma at the 18-ft contour in the Gulf of Mexico navigation channel at Cat Island Pass located at the entrance to Terrebonne Bay (Figure 1). The HNC serves as a principal commercial navigation route connecting the Gulf of Mexico with the interior of the central coast of Louisiana. Along its length, the HNC cuts through several natural waterways including Bayous Black, La Carpe, du Large, Petit Caillou, Grand Caillou, Sale, and Little Cocodrie Bayou, most of which empty into Terrebonne Bay. All of these bayous served as regionally important water routes leading inland from the Gulf through the prehistoric and historic periods. In addition, the elevated natural levees of most of these natural streams supported occupation during the prehistoric period and some were occupied into the historic period. Construction of the HNC began in 1958 and the official opening was in June 1962. The present project includes improvements to approximately 24 miles (39 km) of canal and 17 miles (22.5 km) of navigation channel and will deepen the HNC from the authorized 15-ft-depth to an 18-to 23-foot-depth. The HNC Deepening Project also includes approximately 23,263 acres of additional disposal areas and approximately 21.8 miles (34.9 km) of rock

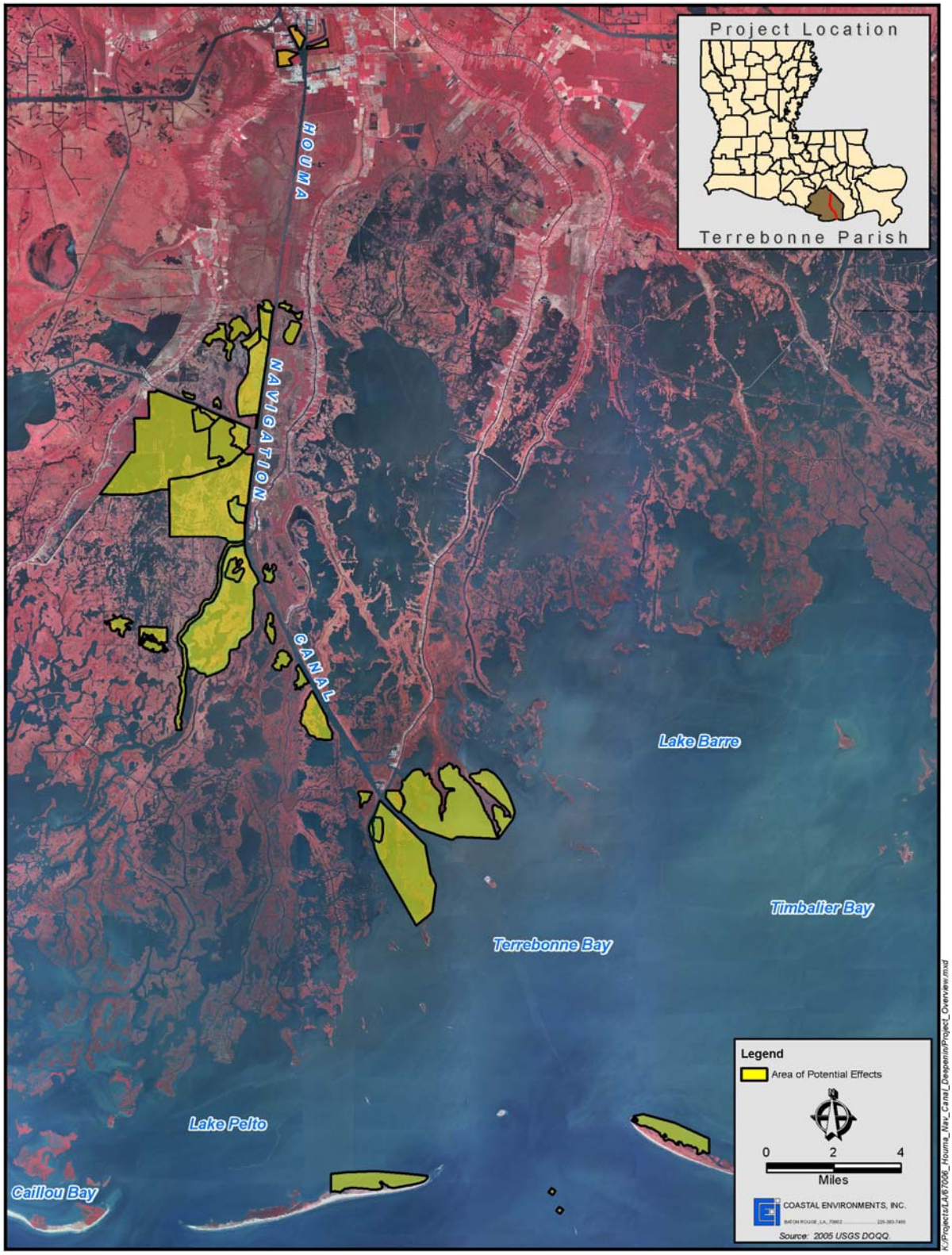

Figure 1. The location of the Houma Navigation Canal Deepening Project.

shoreline protection along the navigation canal. The location of the various project features is shown on a series of large scale plates attached at the end of the report.

In addition to these navigation improvements, the HNC Deepening Project will include marsh restoration, shoreline protection and offshore island restoration at locations in Terrebonne Bay utilizing dredged material recovered during the deepening of the navigation canal. Four of these locations were examined with remote-sensing survey. These locations included two small disposal areas just offshore of the entrance to Terrebonne Bay and two larger restoration areas. One of these restoration areas, consisting of approximately 922 acres, lies on the bay side (north) of the eastern end of Isle Derniere and the other, consisting of 541 acres, is on the bay side of the western end of Timbalier Island. In addition, remote-sensing survey was undertaken along an approximately 6-mile-long stretch of Bayou Grand Caillou, which will be dredged as part of the HNC Deepening Project. The Area of Potential Effects (APE) for the project includes approximately 4970 acres of the canal and navigation channel, 516 acres of Bayou Grand Caillou, and 23,263 acres of dredge material disposal areas for a total of 28,749 acres.

Authority

This study was undertaken in fulfillment of the New Orleans District's obligations under the National Historic Preservation Act of 1966 (NHPA) (Public law 89-665), as amended and the National Environmental Policy Act of 1969 (NEPA) (Public law 91-190). These acts require that the U.S. Army Corps of Engineers (USACE) take into account the effect its undertakings have upon cultural resources within a given project area. Under these laws and regulations, the USACE assumes responsibility for the identification and evaluation of all cultural resources within the project boundaries. In addition, the action is authorized by Section 1135 of the Water Resources Development Act of 1986, as amended. Section 1135 provides the authority to review and modify the structures and operations of water resources projects constructed by the USACE for the purpose of improving the quality of the environment when it is determined that such modifications are feasible, consistent with the authorized project purposes, and will improve the quality of the environment in the public interest. The USACE must also afford the State Historic Preservation Officer (SHPO), interested Native American tribes and, on occasion, the Advisory Council on Historic Preservation (ACHP) the opportunity to review and comment upon proposed undertakings and associated cultural resource investigations. The data collected and presented in this report are intended to satisfy the New Orleans District's obligations under these various laws and regulations and, also, to provide the District with information on cultural resources that can aid in their future management and, if deemed necessary, their protection. This study also contributes to the expanding body of literature dealing with the terrestrial and maritime archaeological resources in coastal Louisiana. In addition, and perhaps most importantly, the results of this study can provide the public with a greater understanding of the rich and unique history of lower Terrebonne Parish.

Report Organization

The remainder of this report is organized in the following fashion. Chapter 2 discusses the environmental setting of the project, and Chapter 3 summarizes our current understanding of the culture history of the region. Previous archaeological research in the

region is discussed in Chapter 4. The research design employed in the present study is presented in Chapter 5, and the results of the fieldwork are described in Chapter 6. Chapter 7 discusses the conclusions of the research and offers recommendations for the sites located during the survey.

All artifacts, field notes, photographs, completed forms, and digital records will be housed at CEI during the course of the project and afterwards will be curated with the Louisiana Division of Archaeology.

CHAPTER 2

ENVIRONMENTAL SETTING

The HNC Deepening Project falls within the physiographic region known as the Mississippi River delta plain. The delta plain includes the lower portion of the present river, its present delta and areas occupied by former deltaic systems of the river. This is a region characterized by both fluvial and deltaic features, such as natural levees; abandoned and relict distributaries; interdistributary basins; vast areas of saline, brackish and fresh marshes; large saline and brackish bays; and coastal lakes, beach ridges and barrier islands. All of this area is low and flat with land surfaces rarely rising more than a few meters above sea level. The areas examined by terrestrial survey fall mainly in brackish and fresh marshes that represent a relict deltaic plain, much of which has subsided beneath the ground surface since its formation. Many, if not most, of the natural waterways extending across these marsh areas represent underfit streams occupying relict channels associated with deltaic formation that took place several thousand years ago. These include Bayou du Large, Bayou Grand Caillou, Bayou Plat, Wax Bayou, Four Point Bayou, Bayou Sale, and Bayou Petit Caillou.

Portions of the HNC Deepening Project lie in Terrebonne Bay, the largest water body in the area. Terrebonne Bay is a segment of a larger brackish water bay system that also includes Timbalier Bay, Lake Pelto, Lake Barre, Lake Felicity and Lake Raccourci. This bay system is bounded on the south by a series of barrier islands and the Gulf of Mexico. These barrier islands include East Timbalier Island, Timbalier Island, Wine Island, and the series of islands collectively known as Isles Dernieres (Last Islands). Wine Island is almost completely gone, exposed primarily during periods of low water, but in the past it was larger and was part of the Isles Dernieres. Several natural passes extend through these barrier islands, connecting the bays with the Gulf of Mexico. These include Little Pass Timbalier, Cat Island Pass, Wine Island Pass and Whiskey Pass. Today, the most important of these is Cat Island Pass, a shallow water pass extending between Timbalier and Wine Island. Cat Island Pass is a natural opening, but one that is now artificially maintained as the Gulf entrance to the Houma Navigation Canal. As noted previously, one element of this study was the remote-sensing survey of two small areas adjacent to Cat Island Pass in the open waters of the Gulf of Mexico.

Terrebonne Bay is bordered on the west by vast saline and brackish marshes associated with the Lafourche Delta Complex. The principal streams flowing through this area, including Bayou du Large, Bayou Grand Caillou, and Bayou Petit Caillou, occupy relict deltaic distributary channels associated with this complex. Historically, these bayous connected the inland port city of Houma, as well as other smaller communities, plantations and farms in Terrebonne Parish, with the Gulf of Mexico through Cat Island Pass. While recreational and some commercial traffic (primarily shrimp and fishing boats) continues on these bayous, much of the commercial traffic now travels along several navigation canals

constructed in the last century. The most important of these canals is the Houma Navigation Canal.

Geological Setting and History of the Project Area

The Mississippi River delta plain is a massive wedge of alluvial and deltaic sediments extending for almost 320 km (200 mi) along the coast of Louisiana and over 100 km (60 mi) inland. Its geologic history is related to a sequence of episodes of delta building and deterioration resulting from the progradation and subsequent abandonment of the present and former Mississippi River courses and deltas over the past 9,000 years or so. Thus, the Mississippi delta plain is a composite geomorphic feature consisting of numerous coalesced and stacked delta complexes which themselves are composed of numerous smaller units, commonly referred to as delta lobes. The surface morphology of each delta plain and lobe is similar, consisting of a network of distributaries that radiate out from an abandoned or active trunk channel and are separated by interdistributary troughs consisting of vast areas of marsh, swamp, ponds and lakes.

The geological history and sequences of delta development are reasonably well known for the lower Terrebonne Parish area. Between 8,000 and 12,000 years B.P. (before present) when sea level was as much as 60 m (200 ft) below its present level, the Mississippi River trended roughly along the present course of Bayou Teche. An entrenched valley associated with this early course runs through Atchafalaya Bay, 65 km (40 mi) or so to the west of the project area (Autin et al. 1991; Seidel et al. 1998). The valley floor of this Late Wisconsinan stream is approximately 45 m (150 ft) below present sea level and the valley itself is largely filled with Late Pleistocene and early Holocene sedimentary sequences. Between about 9,000 years ago and the present as sea level began to rise, the Mississippi River built several delta complexes, each consisting of several delta lobes and numerous subdelta lobes. The delta complexes represent major shifts in the course of the Mississippi River. Drawing from Frazier's (1967) earlier work and relying on recent archaeological data, Saucier (1994) identified the following major delta complexes from oldest to youngest: Maringouin, Teche, St. Bernard, Lafourche, and Plaquemines (Figure 2).

Until recently, most have argued that the Maringouin Delta Complex was the earliest Holocene Mississippi River deltaic feature extending into the offshore waters of central Louisiana. However, Penland et al. (1987), relying on seismic and vibracore data, maintain that an earlier Holocene deltaic feature underlies the Maringouin Complex in offshore central Louisiana, including Terrebonne Parish. They designate this earlier delta the Outer Shoal Delta Complex and others have suggested that it dates between 9,200 and 8,200 years B.P. (Goodwin et al. 1991). The top of the Outer Shoal Delta Complex is a ravinement surface that occurs at a depth of 45 to 75 feet along the central Louisiana coastline. No definitive information on the areal extent of this postulated early delta complex is available and it is unknown if any *in situ* deltaic deposits associated with it exist (Saucier 1994:277).

It is known that three of these delta complexes prograded into the area of lower Terrebonne Parish. These were the Maringouin, Teche and Lafourche. The Maringouin Delta Complex developed in the area between about 7,300 and 6,200 years B.P when the Mississippi River occupied the western part of its present lower valley, generally following

the course of modern Bayou Teche. This delta complex has no surface expression having been eroded or buried beneath younger deltaic deposits (Autin et al. 1991:564).

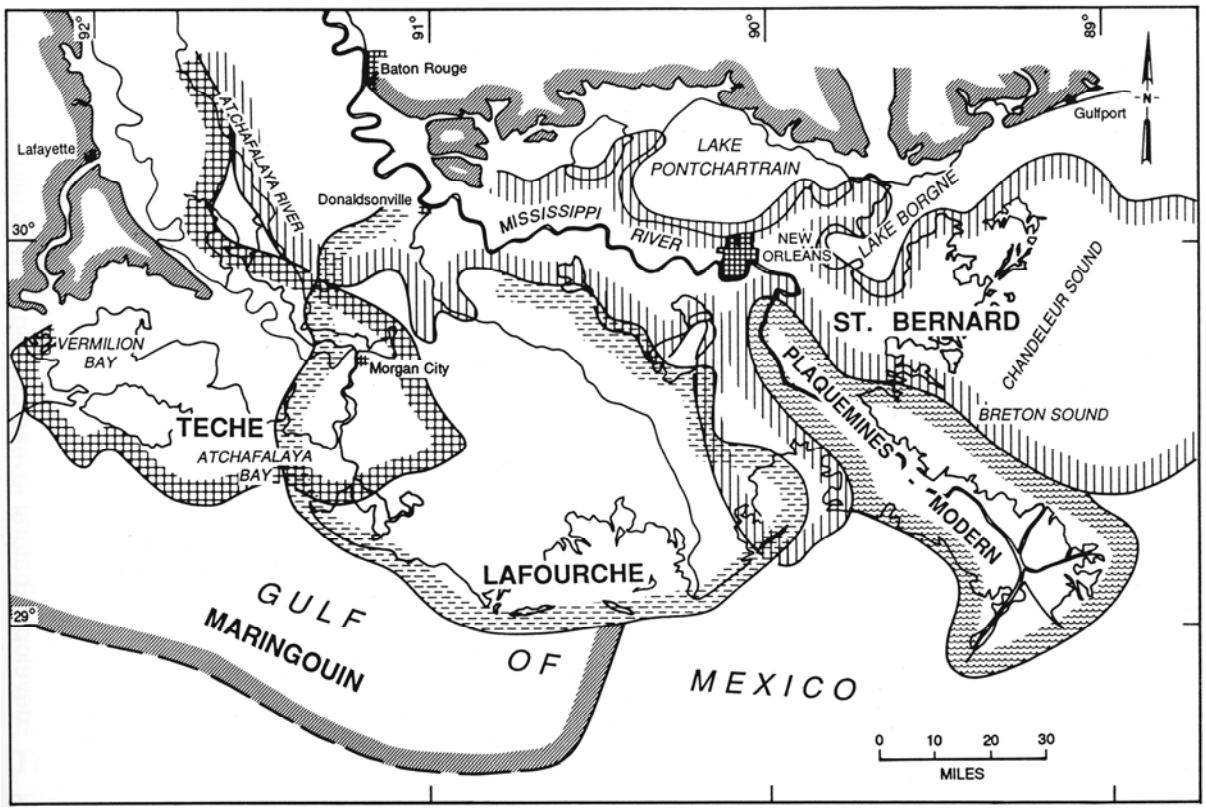

Figure 2. Mississippi River delta complexes (from Saucier 1994:Figure 31B).

Frazier (1967) and others have argued that about 6,000 years B.P. the main course of the Mississippi River shifted to the east, abandoning the distributaries of the Maringouin Delta Complex and starting new deltaic deposition in southeastern Louisiana. This view holds that the Mississippi did not shift back to the west and begin another cycle of delta building off the central Louisiana coast until about 3,800 years B.P. with the establishment of what is termed the Teche Delta Complex. However, recently Saucier (1994:278-279) has proposed that the abandonment of the Maringouin Delta Complex was because of sea level rise not because the Mississippi River shifted to the east. Saucier (1994:278) argues that continued sea level rise after about 6,000 years B.P. submerged large portions of the Maringouin Delta Complex causing erosion, abandonment of distributaries and subsidence, all of which resulted in a shift of the loci of deltaic sedimentation farther inland. Regardless of the mechanism, once the fluvial sediment supply into the Maringouin Delta Complex distributaries began to be eliminated about 6,000 years ago deltaic expansion ended and a period of deterioration began. The loosely consolidated sediments and organic deposits within the Maringouin Delta compacted, leading to subsidence. Subsidence, coupled with actual sea level rise, resulted in a rapid relative sea level rise. Some have estimated relative sea level rise in central coastal Louisiana to be have been on the order of 0.40 to 0.54 inches per year (Penland et al. 1985:7-13); although, others suggest a much lower rate (Saucier 1994). Rising sea level, together with cessation of delta growth, led to erosion of deltaic

headlands, landward migration of the shoreline and, ultimately, to inundation and transgression of the Maringouin Delta Complex by marine waters.

Subsequently, new distributary courses formed in the same area as the earlier Maringouin main channel and new deltaic sedimentation began to extend onto the older, now eroded and subsided Maringouin surface. This new delta feature is known as the Teche Delta Complex. The Teche Delta Complex apparently began to develop during a period of slowly rising sea level when the Mississippi River occupied the present course of Bayou Teche. It appears the Teche Complex features began development in the Morgan City area by at least 4,700 years B.P. and possibly as early as 6,000 years B.P. (Saucier 1994:278-280).

Deltaic features of the Teche Complex prograded into the present lower Bayou Teche/Atchafalaya Bay area, covering older Maringouin delta features. Both Maringouin and Teche deltaic deposits have filled and covered the earlier entrenched valley of the late Pleistocene/early Holocene Mississippi River extending under Atchafalaya Bay (Seidel et al. 1998:6). Exactly how far south Teche Delta Complex features extended is unknown, but it does not appear that they prograded much south of the present Louisiana coastline (Saucier 1994:Plates 28K and 28L). The presence of Poverty Point period archaeological sites along relict distributaries in lower Terrebonne Parish southwest of the town of Houma indicates that Teche-age distributaries reached at least that far (Weinstein and Kelley 1992). The thickness of Teche Delta Complex sediments in the HNC Deepening Project area is not well defined, but to the west, in the vicinity of Atchafalaya Bay, these deposits are tens of meters thick. Offshore, the upper section of these Teche deposits have been removed by erosion leaving behind a "ravinement surface" that has been identified in the Atchafalaya Bay (Seidel et al. 1998:6). Penland and Suter (1983:372), using core and seismic data, identify a ravinement surface about nine to 10 m below sea level beneath Isle Dernieres. This may be the eroded surface of Teche Delta Complex features. Weinstein and Kelley (1992:346) identified Poverty Point period materials from two buried prehistoric archaeological sites in the marshes of Terrebonne Parish northwest of Terrebonne Bay that they believe are associated with subsided landforms of the Teche Delta system. These archaeological materials date circa 1,000 to 500 B.C. and were discovered at a depth of 2 to 2.5 m (7 to 8 ft) below the present ground surface. These archaeological sites lie about 40 km (25 mi) north of the ravinement surface identified by Penland and Suter beneath Isle Dernieres. The rather significant difference in elevation between these two identified Teche surfaces is probably related to several factors, including the original differences in elevations of these two parts of the delta system, differential rates of subsidence, and, probably most importantly, that marine erosion has removed the upper portion of the Teche surface in the vicinity of Isle Dernieres.

The Teche Delta Complex is believed to have been mainly active for about 1,000 years, but some distributaries in the system seem to have continued to receive flow to about 2,500 years B.P. Ultimately, the loss of water flow and sediment transport through the distributaries of the Teche Delta system, coupled with subsidence and rising sea levels, initiated the cycle of erosion, deterioration and, finally, inundation of much of the southern margin of the Teche Delta Complex. However, some relict distributary channels associated with the Teche Delta system are expressed at or near the surface in the low marshlands of the Atchafalaya Bay region. Geological and archaeological research has indicated that the natural levees associated with these channels have subsided by as much as 2 m since their abandonment approximately 2,500 years B.P. (Weinstein and Kelley 1992:287).

Beginning approximately 1,500 years B.P, the Lafourche Delta Complex began to extend into the region of present-day Terrebonne Bay and lower Terrebonne Parish (Törnqvist et al. 1996). This date is later than that proposed by earlier geological studies, but is in line with currently available archaeological data from the Terrebonne region (Weinstein and Kelley 1992). This delta system was fed by Mississippi River waters flowing down present-day Bayou Lafourche and through a series of other channels extending south and southwest of the town of Thibodaux, Louisiana. By about 1,000 years B.P., this delta system had spread sedimentation over much of what is now Terrebonne Parish (Saucier 1994:283). The Lafourche Delta Complex prograded south to a point slightly gulfward of the present Louisiana coastline covering submerged portions of earlier Teche and Maringouin delta complex features.

Bayous Grand Caillou, Petit Caillou and Terrebonne constitute now-relict channels that were major distributaries of the Lafourche system. At its greatest extent approximately 1000 years ago, these two bayous, other distributary channels and associated deltaic landforms would have extended to and possibly south of the present shoreline. At that time, the natural settings of the HNC Deepening Project areas would have been typical of distributary systems; i.e., either natural levee or interdistributary environments and landforms. In Lake Pelto, at the southern edge of the project area, the tops of now buried channels associated with the Lafourche system have been identified in seismic records at depths of only 2 to 3 m below sea level (Penland and Suter 1983:372). There seems to be no doubt that these buried channels represent extensions of the relict distributary bayous still extant in the marshlands north of Lake Pelto and just west of Bayou Petit Caillou, such as Bayous Sale or Oak Bayou. In the vicinity of Isle Dernieres, delta front and distributary deposits that are associated with the abandoned Lafourche delta complex lie above this ravinement surface.

Mississippi River flow into the Lafourche Delta Complex began to decline about 500 to 600 years ago and the system entered a stage of deterioration from erosion and subsidence. As a result, the southern portions of this deltaic system have been entirely removed and inundated; although, most of the exposed land in lower Lafourche and Terrebonne parishes represents Lafourche Delta Complex surfaces. The modern Isle Dernieres and Timbalier island systems represent barrier islands formed by erosion of the distal ends of Lafourche Delta features that winnowed and removed fine-grained sediments leaving behind the sands that have formed the islands. It is believed that these islands mark the approximate southern extent of most Lafourche Delta features. Some deltaic deposition may have occurred southward of the present position of these islands but it probably did not extend much beyond them.

Possibly after only 500 years or so of progradation, flow into the Lafourche-Terrebonne system from the main trunk of the Mississippi River began to decrease and, soon, the system began to deteriorate. The distributary channels of the system began to subside and their distal ends to erode.

Bay and lagoon deposits constitute the bay floor sediments in the Terrebonne Bay portion of the project area. These deposits, which in places are up to 2 m thick, represent

eroded and reworked distributary sediments associated with Lafourche-Terrebonne delta features.

The barrier islands bounding Terrebonne Bay on the south were formed as the margins of the Lafourche-Terrebonne Delta began to erode back once flow into the distributary system ceased about 1000 years ago. The Timbalier Islands were created over the last 300 years as erosion from the Caminada-Moreau Headland at the mouth of Bayou Lafourche supplied sand for barrier development. Landforms developed into continuous duned terraces and spits on the downdrift ends of the islands. The Timbalier Islands are, therefore, "laterally-migrating, flanking barrier islands built by recurved spit processes" (Williams et al. 1992:4). The Isles Dernieres are older and were formed by the erosion of the Bayou Petit Caillou headland and beach ridges over the last 600 to 800 years (Williams et al. 1992:4).

Recent Landform Changes in the HNC Deepening Project Area

With the abandonment of the Lafourche-Terrebonne Delta Complex by water flow from the Mississippi River possibly as early as 1000 years ago, natural levee formation ended, progradation stopped and subsidence and erosion began to remove landforms associated with this now-relict system. The loss of land corresponded with the expansion of the shallow water bays in the area such as Terrebonne Bay and Lake Pelto. A lack of data makes the very early history of land loss and landform change in the HNC Deepening Project area difficult to assess, but information on the more recent history of these changes can be gleaned from cartographic sources and from historic accounts. This assessment of landform changes is of importance in helping to establish the potential the area had for supporting settlement and vessel traffic over time as well as its potential for containing the remains of prehistoric and historic terrestrial sites as well as lost historic vessels.

The most significant land loss has occurred at the distal end of the old Lafourche-Terrebonne Delta, in extreme southern Terrebonne Parish, adjacent to the Gulf of Mexico and Terrebonne Bay. The nature of some of this land loss has been described by Pearson (2001), and that information is presented here to give some idea of the dramatic changes that have occurred in the recent past. A number of nineteenth century maps are available that portray landforms in this region: however few of these are very detailed. The earliest township plat maps of the area, based on surveys conducted in 1831, 1832 and 1839, contain some general information on the nature of land surfaces in lower Terrebonne Parish during that time. For example, surveys along lower Bayou Petit Caillou (Townships 21 and 22 South, Range 18 E) show that sections were mapped and platted along both sides of the bayou all the way down to what is now known as Pass la Poule, within a half mile or so of present-day Point Mast (Louisiana State Land Office [hereinafter cited LSLO] 1832, 1842). This suggests that there were exposed and elevated natural levees or relatively high marsh extant along this entire lower stretch of the bayou. However, these original plat maps do indicate that elevated land adjacent to the bayou must have narrowed considerably about 4 mi south of the community of Cocodrie, corresponding roughly to the southern boundary of Township 21 South, because few "long lot" sections (i.e., sections that are long and narrow with the long axis extending from the bank of the bayou across the width of the natural levee

toward or into the backswamp or marsh) are mapped in Township 22.[1] Today, most of the area contained in the land sections along Bayou Petit Caillou below the community of Cocodrie consists of open water; most of the high ground that existed there just 150 years ago has been lost to processes of subsidence and erosion.

Similarly, the early plat maps for the lower end of Bayou Terrebonne show long lot sections extending well out into Terrebonne Bay, well beyond Pass Barre, an area that today is entirely open water (LSLO 1832). As on Petit Caillou, the presence of these long lots suggests that areas of elevated land existed there in the 1830s when the survey of lower Bayou Terrebonne was conducted. Today, as along lower Bayou Petit Caillou, almost all of this elevated land has subsided and eroded away, leaving open water and some small areas of marsh.

Several other nineteenth century maps of the area were examined and all show that marsh and natural levee landforms were considerably more extensive in the area than they are today. For example, an 1853 coastal chart shows marshland extending almost all of the way to Isle Dernieres with Lake Pelto existing as a very narrow water body separating the island from the mainland (Penland and Suter 1983:372). Although not as detailed, other mid-nineteenth century maps show that distributary landforms (i.e., natural levee and marsh) of both Bayou Terrebonne and Bayou Petit Caillou extended much farther south than they do today. Both Colton's (1860) and Gray's (1879) maps of Louisiana show these two bayous stretching most all of the way across present-day Terrebonne Bay. One hundred fifty years ago landforms associated with Bayou Terrebonne extended almost all of the way to Caillou Island, located just north of Timbalier Island, such that they almost completely separated Terrebonne Bay from Timbalier Bay. Similarly, landforms associated with Bayou Petit Caillou stretched almost all of the way to the eastern tip of Isle Dernieres.

Several written accounts support the information shown on these maps. For example, an 1880 Corps of Engineers survey report examining Bayou Terrebonne noted that the mouth of the bayou had previously been at Caillou Island (located just north of the western end Timbalier Island), as is shown on Colton's and Gray's maps. It was reported that in 1850 Bayou Terrebonne ran between narrow strips of sea marsh between Timbalier Bay and Terrebonne Bay and that trips from Montegut all the way to Caillou Island by land were common (Chief of Engineers [hereinafter cited ARCE] 1880:1180; Guidry 1985:37). However, by the time of the survey in 1880, this area of marsh had been broken up into isolated grass islands by the action of waves (ARCE 1880:1180). These processes of subsidence and erosion have continued and more fast lands are being eroded and water bodies, such as Terrebonne Bay and Lake Pelto, continue to expand.

[1] An examination of section lines shown on the 1935 and 1983 USGS quadrangle maps shows that those located below Cocodrie are obviously incorrectly plotted. The original plat maps, made in the 1830s, definitively show that the long lot sections in the lower portion of Township 21 South and the northern portion of Township 22 South, Range 18 East are located on either side of Bayou Petit Caillou. However, on all modern quadrangles examined all of these sections are shifted a mile or so to the east. The original surveyors certainly followed Bayou Petit Caillou below Cocodrie, but it appears they either provided incorrect coordinates for the western line of the two townships (Range 18E) or later map makers have made the mistake.

CHAPTER 3

CULTURAL HISTORY

Prehistory

This section will provide information on our current understanding of the cultural chronology of the central Louisiana coast, particularly the lower Atchafalaya Basin and adjacent marshes in the prehistoric and contact periods. As much of this information has been presented previously (Brown et al. 1997, 2000; Gibson 1978, 1979; Goodwin et al. 1985a; Neuman 1977, 1984; Weinstein 1994; Weinstein et al. 1978; Weinstein and Kelley 1992), only a brief synopsis is provided.

Figure 3 provides the current chronological framework of the prehistory of the Louisiana coastal zone, based on Weinstein (1985). Since the earliest intact and accessible landforms within the present project area are related to the Teche-Mississippi course and its distributaries (ca. 3800 to 1900 B.C.), the following discussion will begin with the earliest culture period that was in existence during that time: the Middle Archaic. Although earlier Paleo-Indian and Early Archaic components are known from the coastal zone (see, for instance, Coastal Environments, Inc. 1977; Gagliano 1967, 1970; Weinstein et al. 1979b), these generally occur in areas where relict Pleistocene-age, Prairie Terrace features are being exposed by shoreline transgression or on uplifted salt dome islands. Such features are deeply buried within the present project area and would not be encountered in anything but relatively deep borings.

The previous Paleo-Indian and Early Archaic populations are believed to have been arranged around a band-level society which practiced hunting and gathering of wild foodstuffs, probably organized around a seasonal round in which specific periods of the year were devoted to the collection of a particular resource. The Paleo-Indians were supposedly adapted to terminal Pleistocene or early Holocene environments, while Early Archaic peoples were adapted to an expanding boreal forest environment. Lithic tools, principally in the form of distinctive projectile point types, are almost the only means archeologists have for identifying remains of these earlier periods.

Middle Archaic Period, 5000-3000 B.C.

The Middle Archaic period is characterized by widespread regional differentiation of cultures, and a number of developments in ground stone technology. The latter includes grooved axes, atlatl weights and pendants as well as more extensive use of grinding stones which first appeared in the previous period. This period also roughly corresponds with the Hypsithermal Interval which brought increased warmth and aridity to areas bordering the

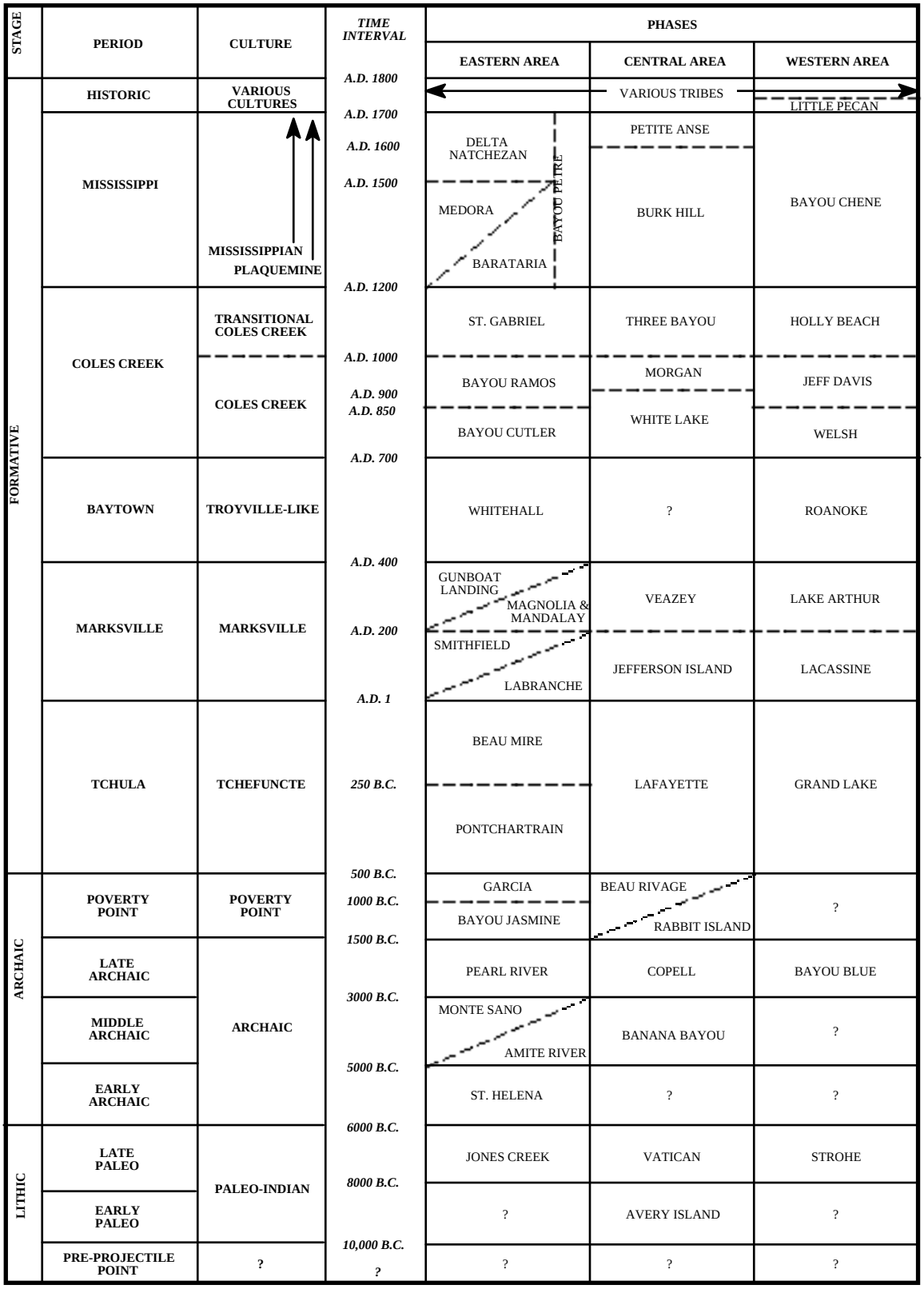

Figure 3. Cultural chronology of south Louisiana (Weinstein 1985).

Great Plains (Wood and McMillan 1976). The impact of this climatic shift on other portions of the Southeast is not well known at present. It may be that the intensive shellfish collecting evidenced at some riverine sites of this period represents a response to this change (Lewis and Lewis 1961:20). Stoltman (1978:714-715) has also suggested that plant collecting increased in importance during this time.

During this period sedentism and more complex social organization are reflected in increased site size, midden development, the use of storage pits, utilization of local raw materials, and an increase in the number of burials (Jeter et al. 1989:86; Weinstein and Rivet 1978). Additionally, evidence of Middle Archaic mound building has been found in South Louisiana (Gibson and Shenkel 1989; Homberg 1992; Manuel 1979, 1981; Neuman 1992; Russo 1994: Table 1; Saunders 1994b).

In coastal Louisiana, very little evidence of the Middle Archaic period has been recognized. What there is comes generally from the Florida Parishes north of Lake Pontchartrain and in the Prairie Terrace region of southwestern Louisiana. Three regional phases have been identified, Monte Sano, Amite River, and Banana Bayou, but all are somewhat removed from the area under consideration. Perhaps components of the Banana Bayou phase, named for a small conical mound (16IB24) situated on the flanks of Avery Island that produced material and radiocarbon dates suggestive of a transitional Middle to Late Archaic age (Gagliano 1967; Brown and Lambert-Brown 1978), will eventually be found in the area. Artifacts recovered from the primary mound at Banana Bayou included Williams and Pontchartrain points, crude bifaces, lithic debitage, and a relatively large percentage of amorphous baked clay objects (Brown and Lambert-Brown 1978:Table 5).

Closer to the project area and of immediate importance to the Teche Delta Complex, is the Darby site, 16IB101, on the edge of the Prairie Terrace overlooking the Teche trunk channel just south of New Iberia. This site reportedly has a Middle Archaic component (Coastal Environments, Inc. 1977:3:Pls. 4-5) and may represent an elevated habitation locale associated with the active Teche delta.

Late Archaic Period, 3000-1500 B.C.

Research elsewhere in eastern North America suggests that the Late Archaic period was a time of marked population increases and the beginning of extensive trade networks. The evidence for the former is seen in the appearance of large habitation sites such as Indian Knoll, Kentucky (Webb 1946), while the latter is reflected in the exotic raw materials that occur at some sites. Cultivation involving several native seed plants, including sumpweed, chenopod, and sunflower, as well as squash, which is now thought to have been independently domesticated in eastern North America, also began during this period (Smith 1989).

Mound building continued into the Late Archaic in the Southeast. Recent excavations and a reevaluation of past investigations now suggest that the building of conical mounds was an inherent part of Archaic period culture in the southeastern U.S. (Piatek 1994; Saunders 1994b; Saunders et al. 1994). At least 11 mound sites in Louisiana and Florida have been securely radiocarbon dated to the Archaic period (Russo 1994:Table 1). Mound

building and initial plant cultivation appears to reflect an increase in social and cultural complexity through the Late Archaic period.

In coastal Louisiana, three geographically separated phases have been identified, but only the Pearl River phase, based on material from the Cedarland site (22HA506) in Hancock County, Mississippi (Gagliano and Webb 1970), is relatively well known. The Copell Phase is based on excavations into an apparent preceramic cemetery (16VM7/8) on Pecan Island (Collins 1941), while the Bayou Blue Phase is named after a site (16AL1) in Allen Parish (Coastal Environments, Inc. 1977; Gagliano et al. 1982; Weinstein et al. 1977, 1979b). Typical diagnostic artifacts include Evans, Ensor, Gary, Maçon, Palmillas, and Pontchartrain point types (Gagliano and Webb 1970; Gibson 1976), along with ground- stone implements such as winged atlatl weights and tubular pipes (Gagliano and Webb 1970:Table 3).

Gibson (1976) has noted several apparent Late Archaic assemblages from the Prairie Terrace surface around Lafayette, while Weinstein et al. (1979b) record similar sites near Opelousas. Of particular importance to the present study are several Late Archaic sites that apparently are directly associated with Teche delta natural levees (Gagliano et al. 1978). These are sites 16SL16 and 16SL19 reported by Neuman and Servello (1976:24) in the Holocene floodplain east of Opelousas. Their presence is almost certainly related to the Teche channel after the Mississippi had abandoned this course. The fact that such sites exist on the Teche natural levees to the north of the project area implies that similar sites could occur in the Terrebonne marsh region.

Poverty Point Period, 1500-500 B.C.

In much of eastern North America this time interval witnessed a transition from Archaic hunting and gathering cultures to Woodland cultures characterized by food production, pottery manufacture, and mound building (Stoltman 1978:715-717). Current interpretations suggest that these three features have different and possibly unrelated origins. As noted above, tropical domesticates had reached the East prior to 2000 B.C., and there is good evidence of cultivation of native seed plants in the Kentucky and Ohio area by 1000 B.C. (Struever and Vickery 1973). Ceramics probably appeared somewhat earlier than this in the third millennium B.C. along the Atlantic Coast (Stoltman 1978:715), and mound building may have developed independently in several areas by 1000 B.C.

In the Lower Mississippi Valley, this transition is marked by the development of the distinctive Poverty Point culture. Among the material characteristics of this culture are baked clay balls or Poverty Point objects, microlith and lapidary industries, and earthworks (Webb 1977). Pottery is not abundant, but fiber-tempered and sand-tempered wares have been found at several sites. Subsistence data are, in general, few, but they suggest a continuation of an Archaic pattern of intensive collecting of wild plants and animals. However, there is mounting evidence for the cultivation of a tropical domesticate, squash, at Poverty Point sites (Ford 1974; Jackson 1986; Shea 1978).

As with the previous culture periods, several Poverty Point period phases have been established for south Louisiana but their recognized ranges are either too far east or west to include the present project area. Nevertheless, Poverty Point components have been recognized at a number of sites relatively near the project area, and it is likely that ties to

either the Rabbit Island (Phillips 1970:875) or Beau Rivage (Gibson 1974a, 1974b, 1976) phases will be found. In fact, the Rabbit Island site itself (16SMY8) is located only about 30 km west of the mouth of the Atchafalaya River at the distal end of the Bayou Sale distributary—a channel emanating from the Teche trunk channel (Smith et al. 1986:Pl. 38; Weinstein and Gagliano 1985:123). Other sites with Poverty Point components include Cargill Canal (16SMY102) located at the edge of the Belle Isle salt dome (Brown et al. 1979:36-40; Weinstein 1984:11-13; Veatch 1899:299), and Negro Hammock (16SMY32) (Coastal Environments, Inc. 1977:3:Pls. 4-5), a locale possibly associated with a Teche distributary (Smith et al. 1986:Pl. 39). Two Late Poverty Point sites located in the marshes of Terrebonne Parish by Weinstein and Kelley (1992) are Bois D'Arc #1 (16TR211) and Bois D'Arc #2 (16TR212). The former, a shell midden, and the latter, an earth midden, both produced Poverty Point objects. Their presence suggests that the abandoned channel along which the sites occur (Turtle Bayou) is a Teche-age channel.

Tchula Period, 500 B.C.-A.D. 1

This period in the Lower Mississippi Valley is characterized by the integration of food production, pottery manufacture, and mound building into a single cultural system. In the southern portion of the valley these developments take place in an archeological culture called Tchefuncte. Originally defined in southern Louisiana (Ford and Quimby 1945), Tchefuncte culture is now recognized to extend as far north as the vicinity of Clarksdale, Mississippi and as far west as northeast Texas. The diagnostic artifacts of this and most of the succeeding prehistoric cultures of the Lower Mississippi Valley are distinctive ceramics. Tchefuncte pottery is characterized by a laminated paste that appears to lack tempering. Replication studies suggest that the laminated texture is simply the result of minimal preparation of the raw material (Gertjejansen 1982; Gertjejansen and Shenkel 1983), an expected feature of an incipient ceramic technology. Other diagnostic attributes of Tchefuncte ceramics include the use of podal supports and decorative techniques such as jab-and-drag incising.

The evidence for food production in Tchefuncte culture presently comes from one site, Morton Shell Mound (16IB3), where remains of two tropical cultigens–squash and bottle gourd, and one possible native cultigen, knotweed–were recovered (Byrd and Neuman 1978:11-13). Given the limited nature of these findings, the importance of cultivation in relation to the remainder of the subsistence base is still uncertain. Mound construction, now well documented for the preceding Late Archaic and Poverty Point periods, is surprisingly not clearly associated with Tchefuncte culture. Alan Toth (1988:27-28) reviewed the evidence for Tchefuncte burial mounds and suggested that they are the result of diffusion of certain aspects of Marksville burial practices among a few late Tchefuncte groups. Further research is required to verify this hypothesis.

Again, no specific phase of Tchefuncte culture has been defined for the present project area, and, in fact, no Tchefuncte sites were known from it prior to Weinstein and Kelley's 1992 Terrebonne Marsh study. Tchula components, most of them late, were identified at Pennison (16AS16), a single mound site; Bayou Caroline Mounds (16AS36), a possible mound site; the shell midden sites Lake Pagie (16TR28), Bayou DeCade (16TR31), and St. Paul Bayou (16TR60); and the two Poverty Point sites mentioned above, 16TR211 and 16TR212. Given the proximity of the Lafayette phase and its association with the

natural levees of the Teche meander belt (Gagliano 1967; Phillips 1970; Gibson 1974b, 1976; Weinstein 1986), it is highly likely that additional components of this phase are present. The fact that Tchefuncte sites of the Lafayette phase or a similar entity occur within the project area is particularly interesting since the Lafayette phase is the one relatively reliable case where conical burial mounds have been associated with the Tchefuncte culture (Gibson 1974b; Weinstein 1986). Gibson (1974a:85) suggests that the mounds served as communal burial locales for a dispersed population residing at small, seasonal base camps or semi-permanent villages.

Marksville Period, A.D. 1-400

In many parts of eastern North America this period is marked by evidence of extensive interregional contact through a phenomenon labeled the Hopewell Interaction Sphere (Caldwell and Hall 1964). The focal points of this interaction sphere were societies in the Ohio and Illinois River valleys which acquired large quantities of exotic raw materials, including obsidian, copper, mica, shark's teeth, and marine shells, in exchange for specialized finished goods such as copper panpipes and ear spools (Stoltman 1978:721). Various theories have been offered to explain the nature of this interaction, some emphasizing socioreligious systems and others pointing to economic networks but the problem remains unresolved. Within the Lower Mississippi Valley, the culture that participated in this interaction sphere is termed Marksville.

Toth (1988:211-213) has argued that Marksville culture developed out of Tchefuncte as a result of intermittent contacts with cultures in the Illinois River valley area but he only speculates on the nature of these contacts. He emphasizes that the evidence for Hopewellian interaction is largely limited to the Marksville mortuary system and aspects of ceramic decoration. Other cultural subsystems, such as subsistence and settlement pattern, may have changed very little. Economic data from Marksville sites are extremely limited, but information from contemporary occupations in the Midwest suggests a pattern of intensive collecting of wild plant foods and high density faunal resources such as fish, supplemented by cultivation of native North American seed plants and a few tropical cultigens (Asch et al. 1979). Present evidence indicates that maize was either not present at this time or of only minor importance.

It is for the Marksville period that the first large-scale evidence of sites in the project area can be found (Altschul 1978; Gibson 1978; McIntire 1958; Phillips 1970; Weinstein et al. 1978). Principal among these are the Gibson Mounds (16TR5) and Mandalay Plantation (16TR1). Phillips (1970) designated Mandalay Plantation as the type site of the Mandalay phase. With the creation by Toth (1977, 1988) of the Jefferson Island phase as representative of the general area's early Marksville phase, Weinstein et al. (1978) reduced Mandalay to the late Marksville period. At present, only a portion of the assemblage from the Gibson Mounds (Weinstein et al. 1978) can be unequivocally assigned to the early Marksville period.

A substantial number of late Marksville sites exist in the project area. Many of these were initially identified by McIntire (1958:Pl. 5) as Troyville in age, but have been reassigned to the late Marksville period on the basis of revised ceramic analysis (Weinstein and Gagliano 1985:141-142, Fig. 7). Most of these sites are associated with the du Large,

Marmande, and Mauvais Bois distributary channels; although, four sites (Lake Penchant (16TR4), Bayou Penchant I (16TR47), Bayou Penchant (16TR76), and Little Carencro Bayou (16TR77) are located on the possible relict beach ridge near Lake Penchant (Weinstein and Gagliano 1985:Fig. 7). Some of the best evidence for a late Marksville component in the project area comes from Gibson's (1978:Table 16) test pit into the Oak Chenier site (16SMY49) near the junction of bayous Chene and Penchant. The lower levels of the pit (35-75 cm) yielded decorated ceramics only of the late Marksville period: Marksville Incised, *var*. *Yokena* and Marksville Stamped, *var*. *Manny*. These levels also produced a flexed burial (Gibson 1978:129, Fig. 28).

Baytown Period, A.D. 400-700

The period following the Hopewellian florescence has been characterized as a time of cultural decline throughout much of eastern North America (Griffin 1967:187). This is certainly implied in Phillip's (1970:901) statement that ceramic decoration was "at a remarkably low ebb" during this period in the Lower Mississippi Valley. Recently, however, a number of researchers have suggested that the apparent decline may not have been as pervasive as previously believed. In the Midwest, Braun (1977) and Styles (1981) have argued that this period, in contrast to earlier interpretations, was a time of population growth and increased regional social integration. Along the Florida Gulf Coast an elaborate culture called Weeden Island developed during this time (Milanich and Fairbanks 1980:89-143). Even in the Lower Mississippi Valley, new data indicate that the Baytown period was marked by the appearance of two painted pottery complexes (Belmont and Williams 1981). The earlier complex, termed the Quafalorma horizon, exhibited striking similarities to early Weeden Island ceramics. The later complex, called the Woodville horizon, was less elaborate. The remainder of the ceramic assemblage of the Baytown period consisted of a large quantity of Baytown Plain and smaller amounts of decorated types such as Mulberry Creek Cordmarked, Salomon Brushed, and Alligator Incised.

Changes were also occurring in the stone tool tradition during this period. Small arrow points began to replace dart points, reflecting a transition from the atlatl to the bow and arrow. Subsistence data from the Lower Mississippi Valley are limited for this period, but in the Midwest, Styles (1981) has identified a pattern of intensive, localized collecting of wild plant and animal resources supplemented by increased cultivation of both North America and tropical cultigens. Mound building continued in the Baytown period, and there are indications that a shift from a mortuary function to a building substructure began toward the end of this time (Rolingson 1982).

Much like the remainder of south Louisiana, the Troyville-like culture present within the project area during Baytown times is poorly understood. To date, most sites yielding examples of painted pottery on a Baytown Plain paste have been assigned to this time frame. As can be seen by Figure 4-1, however, this leaves little room for fine-scale cultural differentiation, and the Whitehall phase, named for the Whitehall site (16LV19) on the Amite River (Phillips 1970; Weinstein 1974), remained the sole phase representative for all of southeast and south-central Louisiana until recently.

Kidder et al. (1995) have suggested that Whitehall be limited to that area north of the Barataria Basin and have established the Grand Bayou and Des Allemands phases for coastal

Louisiana. The earlier phase, Grand Bayou, is represented by ceramics similar to the Troyville types seen at the Greenhouse site (16AV2) and in the Tensas Basin. These include Marksville Incised, *vars. Anglim* and *Vick*; Marksville Stamped, *var. Baton Rouge*; Larto Red and late varieties of Churupa Punctated. Grand Bayou phase components have been identified at 16SC42, 16SC43, Canal No. 11 (16SC45), and Isle Bonne (16JE60).

The later Des Allemands phase is distinguished by the lack of Marksville Stamped and Incised, continued red filming, the appearance of Evansville Punctated, Hollyknowe Pinched and Mazique Incised, *var. Bruly;* the Weeden Island-like Woodville Zoned Red and early varieties of French Fork Incised and the "six mile" rim treatment. Single line varieties of Coles Creek Incised also begin to appear during this phase. Isle Bonne (16JE60) is considered the type site for the Des Allemands phase. The Gibson Mounds site (16TR5), where Weinstein et al. (1978:Tables 29-30, Fig. 63) reported a ceramic assemblage composed of Coles Creek Incised, *var*. *Stoner*; Larto Red, *vars*. *Larto* and *Silver Creek*; Mazique Incised, *var*. *Bruly*; Woodville Zoned Red, *var*. *Woodville*; French Fork lugs and Evansville Punctated, *var*. *Amite* (Phillips' [1970] "six-mile treatment") as well as numerous varieties of French Fork Incised, apparently dates to this phase.

At Richeu Field (16TR82), a low, pyramidal mound on the Teche natural levee about 1.5 mi (2.4 km) southwest of Gibson, Weinstein et al. (1978:Tables 38-39) recovered sherds of Larto Red, *var*. *Larto*; Evansville Punctated, *var*. *Amite* and several rims of Baytown Plain, *var*. *Troyville*. This site, probably a small hamlet associated with the more prominent village at Gibson (16TR5), could contain components from both Grand Bayou and Des Allemands phases.

Coles Creek Period, A.D. 700-1200

Elsewhere in eastern North America this time interval corresponds to the latter portion of the Late Woodland period and the beginning of the Mississippi period. Within the Lower Mississippi Valley, a cultural florescence that shows a marked resemblance to Weeden Island culture of northwest Florida occurs during this period. The precise nature of the relationship of Coles Creek culture to Weeden Island is uncertain but the similarities in ceramic decoration and community pattern are unmistakable. Both were characterized by the use of incised, stamped, and punctated pottery types in which the decorative zone is largely restricted to a band around the rim of the vessel and by the construction of small platform mounds around plazas. The latter are generally interpreted as an indication of the development of stratified social systems during this period. These societies were apparently based on economies that included the cultivation of maize. While direct evidence for this is lacking from sites in the Lower Mississippi Valley, the remains of corn have been recovered from Weeden Island sites (Milanich and Fairbanks 1980:127) and from contemporary Late Woodland sites in the Midwest (Styles 1981).

Coles Creek period sites are relatively common within the project area, 24 of which having been plotted by Weinstein and Gagliano (1985:Fig. 9), and can be related to one or more of three temporally sequential phases for the region: Bayou Cutler, Bayou Ramos, and St. Gabriel. While the Bayou Cutler phase (established by Phillips [1970], based on data from Kniffin [1936] and McIntire [1958]) and the St. Gabriel phase (set up by Brown [1985b] on data supplied by Woodiel [1980]) are situated primarily east of the project area,

the Bayou Ramos phase is centered squarely within it. As noted, this phase was created by Weinstein et al. (1978) using data from two test pits at the Bayou Ramos I site (16SMY133) located at the junction of Bayou Ramos and Bayou Boeuf.

As with most other phase designations, it is the various ceramic types and varieties that serve to separate the Bayou Ramos phase from its earlier and later Coles Creek counterparts. Bayou Cutler components can be recognized by many of the classic Coles Creek ceramic types and varieties: Coles Creek Incised, *vars. Coles Creek* and *Athanasio*; Mazique Incised, *var. Mazique*; Pontchartrain Creek Stamped, *var. Pontchartrain* and French Fork Incised. Bayou Ramos components can be identified by sherds of Coles Creek Incised, *var. Mott*; Mazique Incised, *var. Kings Point*; Beldeau Incised, *var. Beldeau*; Avoyelles Punctated, *var. Avoyelles* and Pontchartrain Check Stamped, *var. Tiger Island*. The St. Gabriel phase can be recognized by sherds of Coles Creek Incised, *var. Hardy*; Mazique Incised, *var. Manchac*; Evansville Punctated, *var. Wilkinson*; Harrison Bayou Incised, *var. Harrison Bayou* and minor quantities of Plaquemine Brushed, *var. Plaquemine* (Brown 1985b; Weinstein 1987b).

The latter phase is represented in the general area by two excavated sites, Thibodaux (16AS35) and Goat Island (16SMY1). At Thibodaux, Weinstein et al. (1978:34-55) excavated a stratified shell midden along Bayou Boeuf in which one of the lower strata produced *Rangia* shell that was dated to 975 ± 60 B.P.:A.D. 975. It contained sherds of Plaquemine Brushed, *var. Plaquemine*; Mazique Incised, *var. Manchac* and Addis Plain, *var. Addis*. At Goat Island, Goodwin et al. (1985a:108-110) received excellent St. Gabriel phase radiocarbon dates (840 ± 45 B.P.:A.D. 1110, 860 ± 130 B.P.:A.D. 1090, and 810 ± 80 B.P.:A.D. 1140) from a shell midden which produced only plain unidentified pottery.

Mississippi Period, A.D. 1200-1700

The last prehistoric period in eastern North America witnessed the development of chiefdom-level societies based on intensive cultivation of maize, beans, and squash. Perhaps the most dynamic of these societies appeared in the Middle Mississippi Valley between A.D. 900 and A.D. 1050. Referred to as Mississippian culture, it was characterized by a shell-tempered ceramic industry and a settlement pattern including large mound centers and nucleated habitation sites that were often fortified (Stoltman 1978:725). During the first centuries of the second millennium A.D., this culture spread rapidly along the major river valleys of this portion of the continent. The nature of this expansion, either by movement of people or diffusion of ideas, is still debated, but by A.D. 1200 Mississippian culture was found as far south as northern Mississippi and as far east as Georgia.

In the Lower Mississippi Valley, Mississippian culture encountered an indigenous non-Mississippian culture and a hybridization of the two occurred. Phillips (1970) considered the resident culture to have been Plaquemine, an outgrowth of Coles Creek culture, which began about A.D. 1000. He viewed the interaction between Mississippian and Plaquemine culture as resulting in gradual changes in the Plaquemine ceramic tradition and settlement pattern. Later in the period, after A.D. 1400, an actual intrusion of Mississippian groups displaced the resident Plaquemine groups. Brain (1978) offered a somewhat different interpretation of this sequence of events. He argued that the Lower Mississippi Valley culture that experienced the initial Mississippian contact about A.D. 1200 was Coles Creek,

and that the resulting hybridization produced Plaquemine culture. The remainder of the period saw a gradual increase in Mississippian influence, at least in the Yazoo Basin, until about A.D. 1400 when a full Mississippian cultural pattern was achieved in the Lake George phase (Brain 1978:362; Williams and Brain 1983). Brain's reinterpretation of the cultural sequence has resulted in a shift in the established chronologies. Phases such as Crippen Point and Preston, which were formerly considered Plaquemine culture manifestations of the early Mississippi period, are now placed late in the Coles Creek period and assigned to a transitional Coles Creek culture. The latter now persists until A.D. 1200 and includes a number of changes in ceramic technology that had previously been considered indicators of Plaquemine culture. If Brain is correct, then Plaquemine culture throughout the Lower Mississippi Valley should postdate A.D. 1200 and presumably appear at progressively later times at increasing distance from the Yazoo Basin.

While disagreeing somewhat on the origin of Plaquemine culture, all authorities concur that it exhibited numerous continuities with the preceding Coles Creek culture. Several of the Plaquemine ceramic types appear to be direct outgrowths of Coles Creek types. However, there are some changes, including the addition of small amounts of finely ground shell and other organic matter to the pottery and the extension of the decorative field to include the body of the vessel. Mound construction continued on an even greater scale than in the previous period. The mounds became larger, there were more at each site, and there were more sites. Intensive agriculture is presumed to be the economic base on which this florescence was built, but there is presently little direct evidence of it in the Lower Mississippi Valley.

In the coastal zone of Louisiana, the Gibson site (16TR5) contains a well-pronounced Plaquemine ceramic assemblage (Weinstein et al. 1978), and it is highly likely that the impressive Berwick Mounds, described by Cathcart (Prichard et al. 1945), represented a major Plaquemine center. Coupled with these are smaller, isolated mounds, possibly representing minor villages in the Plaquemine political system. Sites such as Fairview Plantation Mound (16SMY148) (Collins 1927; Weinstein et al. 1978), Marmande Plantation (16TR19) (Altschul 1978; McIntire 1958) and Minerva Plantation (16TR96) (Altschul 1978:205-206), are representative of this group within the present project area. Similarly, numerous shell middens with Plaquemine components are known throughout the region (Altschul 1978; Gibson 1978b; McIntire 1958; Weinstein et al. 1978; Weinstein and Gagliano 1985; Weinstein and Kelley 1992) and probably served as seasonal collecting locales for the residents of the more permanent mound sites.

Three regional phases of early Plaquemine culture occur to the east, west, and north of the project area (see Figure 4-1). The first of these is the Medora phase established by Gagliano (1967) on the data supplied by Quimby (1951) from the WPA-era Medora site (16WBR1) excavations in West Baton Rouge Parish. Medora is, in fact, the type site of the entire Plaquemine culture, and typical ceramics include: Plaquemine Brushed, Coles Creek Incised, *var. Hardy*; Mazique Incised, *var. Manchac*; L'eau Noire Incised; Medora Incised; Anna Incised, *vars. Australia* and *Evangeline* and Pontchartrain Check Stamped.

The second Barataria phase, proffered by Holley and DeMarcay (1977) for sites within the Barataria Basin, principally along bayous des Familles and Barataria, is based on excavations by the Delta Chapter of the Louisiana Archaeological Society at the Fleming site

(16JE36). This phase is present in the eastern coastal zone of Louisiana, while Medora is generally located in interior areas (Kidder et al. 1995). Barataria can be distinguished from Medora by the lack of Plaquemine Brushed and the presence of Southern Cult motifs. The strongest representation of cult designs appears on pottery in the Barataria Basin (Holley and DeMarcay 1977:16; Weinstein 1987b). Other Southern Cult items include fragments of carved stone discs from the Rosedale (16IV1) and Shellhill Plantation (16SJ2) sites (Weinstein 1987c).

The third phase is Burk Hill identified by Brown (1982) on the basis of material from the Burk Hill site (16SMY100) on Cote Blanche Island. This site was first recorded by Lanier Simmons in 1966 and revisited in 1979 during Harvard's Lower Mississippi Valley Petite Anse Project (Brown et al. 1979:30-31). The ceramics recovered (primarily Coles Creek Incised, *var. Hardy* and Plaquemine Brushed, *var. Plaquemine*) indicated occupation during a transitional Coles Creek/Plaquemine phase.

Contact Period

By A.D. 1500, new influences began to be felt in the Louisiana coastal zone as aboriginal groups began to take on the appearance, at least in material culture, of the peoples encountered by the early French explorers. This late Plaquemine culture is recognized by one rather overextended phase called Delta Natchezan. Created by Phillips (1970), this phase includes all south Louisiana sites with ceramics similar to those recorded for the protohistoric and historic Natchez. The type site for this phase is Bayou Goula (16IV11), the assumed location of the historic Bayogoula, excavated during WPA days and reported on by Quimby (1957).

Principal ceramic markers of the Delta Natchezan phase include Fatherland Incised, *vars. Fatherland* and *Bayou Goula* and those versions of Addis Plain that contain small amounts of shell, *vars. Greenville* and/or *St. Catherine* (Quimby 1957:121-128; Brain 1969; Brown 1985a; Phillips 1970; Steponaitis 1974). Mazique Incised, *var. Manchac* and Plaquemine Brushed may be considered minor elements in the assemblage as well. A small spattering of shell-tempered Mississippian sherds also was noted at Bayou Goula, principally the types Mississippi Plain and Pocahontas Punctated. The presence of minority amounts of shell-tempered pottery at other Delta Natchezan sites, such as Isle Bonne (16JE60) and Fleming in the Barataria region (Holley and DeMarcay 1977; Gagliano et al. 1979), argue for a great deal of interaction between the resident Plaquemine peoples and the advancing Mississippians to the north and east.

In the project area, the presence of small amounts of shell-tempered pottery has been recorded by many investigators (Altschul 1978; Gibson 1978b; McIntire 1958:Pl. 13; Weinstein et al. 1978), and these may reflect ties not only to the Mississippian peoples of the Bayou Petre phase to the east, but to what apparently was a small enclave of Lower Valley Mississippians (the Petite Anse phase) who resided on and adjacent to Avery Island (Brown et al. 1979). It has been suggested that this group presumably came to Avery Island to exploit the salt deposits found there and to either trade or carry the salt to the north (Brown et al. 1979).

Near the project area, one Delta Natchezan component has been excavated. At the Thibodaux site (16AS35) on Bayou Boeuf, the upper two midden levels of Test Pit 1 yielded sherds of Fatherland Incised, *vars. Fatherland* and *Bayou Goula*; Maddox Engraved, *var. Emerald*; Plaquemine Brushed and Addis Plain, *vars. Addis* and *Greenville* (Weinstein et al. 1978:Table 2). Radiocarbon assays on these midden levels produced dates of 515 ± 60 B.P.:A.D. 1435 and 460 ± 60 B.P.:A.D. 1490, dates whose sigmas overlap the assumed beginning of the Delta Natchezan phase.

The principal aboriginal groups encountered by European explorers in the vicinity of the project area were the Chitimacha and the Washa or Ouacha. The first recorded contact with one of these groups occurred in March of 1699 when Iberville ascended the Mississippi River (McWilliams 1981:58). One and a half leagues beyond its junction with Bayou Lafourche, which his Indian guide called the Ouacha River, he came upon two canoes, one containing four Bayagoula and the other containing five Ouacha men and two women. The latter were returning to their village, two days travel from there. La Harpe, in *The Historical Journal of the Establishment of the French in Louisiana*, states that the village was located on Bayou Lafourche near those of the Chitimacha and Yagnechitou (de La Harpe 1971:11). He also records that Bienville attempted to visit the Ouacha village in September of 1699. In that entry the village's location is given more precisely as 12 leagues down Bayou Lafourche and one quarter of a league inland (de La Harpe 1971:15). Swanton (1911:298) places it in the area of present-day Labadieville.

The next reference to the Ouacha occurs in 1718 when Penicaut notes that they moved from their former village and settled on the west bank of the Mississippi 11 leagues above New Orleans (McWilliams 1953:219). They apparently occupied or controlled the area back from the river as well for in 1744 Claude Joseph Villars Dubreuil purchased a large tract of land located on the west side of Lake Salvador (also called Lake Washa) from the Ouacha and an allied group the Chaouacha (Hunter et al. 1988:31). Not long after that the Ouacha seem to have disappeared as a separate tribal group.

There is considerably more documentary information on the Chitimacha who retain their tribal identity today. Their first contact with Europeans apparently occurred in 1702, for La Harpe notes that in August of that year Bienville learned of a raid on the Chitimacha by a group of Canadians and Indians led by St. Denis (de La Harpe 1971:41). This marked the beginning of a long period of hostilities between the Chitimacha and the French. In 1706 a group of Chitimacha, having failed in an attempt to attack the Bayagoula, killed the priest St. Cosme and three other Frenchmen somewhere on the Mississippi River (de La Harpe 1971:54). Bienville immediately asked the other Indian groups of the region to join in a war on the Chitimacha, and in March of 1707 St. Denis led a party of French Canadians, Bayagoulas, Biloxis, Chaouachas, and Natchitoches against a Chitimacha village. According to Penicaut the village was located on a lake near Bayou Lafourche (McWilliams 1953:71). He further states that 15 Chitimacha were killed and 40 were taken as prisoners.

Raids between the Chitimacha and Indian groups allied with the French continued until 1718 when Bienville made peace with the tribe, apparently at the request of Dubuisson, the manager of the French concession located on the Mississippi River at the old Bayagoula village (McWilliams 1953:216-219). Under the terms of this agreement, the Chitimacha were to abandon their village on or near Bayou Lafourche and settle on the Mississippi one

league below the concession. Penicaut states that they moved to the new location two weeks later and, in fact, maps of the period show a Chitimacha village in that area (Giardino 1984:253).

Swanton (1911) questions whether this represented the entire tribe or simply one portion of it. In 1739, a French officer with the De Nouaille party reported that the Chitimacha settlement on the Mississippi was relatively small because most of the tribe lived with the Atakapas (Swanton 1911:343). After that there are few references to the Chitimacha until the late-eighteenth century. In the 1770s Thomas Hutchins, at that time a cartographer in the British army, noted that there was a Chitimacha village located on Bayou Lafourche six leagues from its junction with the Mississippi River (Hutchins 1968:40). He also mentioned two other villages that probably represent Chitimacha settlements located on Bayou Teche. One of these, known as Mingo Luoac or Fire Chief, was situated 10 leagues above the mouth of the bayou and the other, called the village of Soulier Rouge or Red Shoes, was located three and a half leagues farther up (Hutchins 1968:46). Goodwin et al. (1985b:207) place the first village on the east side of Irish Bend and the second in the vicinity of modern-day Charenton, the present location of the Chitimacha reservation.

By the early-nineteenth century the Charenton settlement seems to have become the principal village on Bayou Teche. The Cathcart and Landreth expedition of 1819 described it as a row of palmetto-covered cabins, each 50 to 100 yards apart extending for almost 3 mi along the bayou (Newton 1985:108). They also noted two smaller Indian settlements in this area: one a hunting and fishing camp located on Grand Lake near Charenton and the other, known as Position's settlement, consisting of three huts located on Berwick Island on the shore of Six Mile Lake (Newton 1985:52-53; 126-127; Prichard et al. 1945:781-782, 837). The expedition recorded another Indian village, this one under the chief Jean Champlain, on Bayou Plaquemine in the eastern portion of the Atchafalaya Basin (Newton 1985:16; Prichard et al. 1945:760). Although Cathcart and Landreth do not identify it as a Chitimacha settlement, Gibson (1980:3-7), using land claims data, indicates that the occupants were Chitimacha. He also documents the presence of a second Chitimacha village of this period on nearby Bayou Jacob (Gibson 1980:7-10).

In the 1880s Gatschet conducted ethnographic research among the Chitimacha at Charenton and obtained a list of 15 historic villages (Gatschet 1883). Swanton later added to this list on the basis of his own research in 1907 and 1908 (Swanton 1911). Most of these settlements were located along Bayou Teche or on small streams in the Atchafalaya Basin but three were situated on or near Bayou Plaquemine. Goodwin and Associates, Inc. conducted limited test excavations at an archaeological site (16SMY12) believed to represent one of the settlements recorded by Gatschet and Swanton, *Co'ktangi ha'ne hetci'nc* or "Pond-lily worship house" (Goodwin et al. 1985b:209-213). The small collection of aboriginal ceramics recovered in these excavations include a mixture of late Plaquemine and Mississippian types. Also present were six glass beads and a number of sherds of pearlware.

European Settlement

The history of European settlement of south Louisiana begins with La Salle's voyage to the mouth of the Mississippi River in 1682, and Iberville's ascent up the Mississippi River in March 1699. Although the Gulf Coast area had previously been claimed for the King of

Spain in the sixteenth century by Spanish explorers, their sole interest in the territory lay in its potential for providing treasure and no attempts at colonization were made. After Iberville's initial establishment of Forts Maurepas, de la Boulaye and St. Louis de la Mobile, France's strategy for colonization in the early eighteenth century was primarily to bestow private charters upon individuals who were allowed to develop their own lucrative schemes to draw settlers into the area. Plagued by financial troubles, internal strife, and Indian attacks, the speculative ventures of neither Antoine Crozat nor John Law were very successful in populating the colony and Louisiana remained largely unsettled until the influx of the Acadians late in the eighteenth century.

Following the 1763 Treaty of Paris, ending the French and Indian War, France was forced to forfeit to England all of her possessions east of the Mississippi (except New Orleans). Within a year, however, both New Orleans and the lands west of the Mississippi were publicly transferred to Spain; although, a secret treaty dating back to 1762 had already provided for such an act.

In spite of the domestic furor caused by the land transfer, the change from French to Spanish control was accompanied by a productive change regarding governmental priorities for resource development. The Spanish interest in exploiting the colony's rich agricultural potential was manifest in her land grant policies, which required that the grantees build and maintain levees, bridges, roads and ditches or else forfeit their holdings.

The earliest Europeans to visit the present-day Terrebonne Parish area were probably French trappers and, prior to 1765, few Europeans had settled there (Watkins 1939). Beginning in that year, large numbers of French-Canadian exiles arrived in Louisiana to escape British rule in Nova Scotia. Being well adapted to the environmental as well as the political climate afforded in French Louisiana, the Acadians settled the land flanking the many rivers and bayous of south-central and southwestern Louisiana. Most of them arrived in the project region by coming down Bayou Lafourche and across to Bayou Terrebonne. This migration of Acadians continued until about 1795, under the encouragement of the Spanish who had acquired Louisiana from the French in 1763. These Acadian immigrants settled along the fertile natural levee lands along the many bayous in the area and, initially, established small farms. Soon, they spread to most of the habitable natural levee lands in the region and, in addition to farming, took up stock raising, hunting, fishing and trapping. These early French settlers named the region Terrebonne, which means “the good earth,” in recognition of the richness of the area. The earliest families in the project region were Marsh along Bayou Black, Bellanger on Bayou Terrebonne, Prevost on Grand Caillou, Shrivins on Petit Caillou, and Duplantis on the lower Terrebonne and Petit Caillou (Hebert 1978:xxxviii).

The Land

The first evidence of any inhabitants within the general project area comes from the Spanish period and includes a coastal survey conducted by Don José Evía in 1785. Entrusted with the task of accurately mapping and recording the Gulf Coast from the mouth of the Mississippi River westward to the Rio de Tampico, Evía left Southeast Pass on May 15, 1785 in two schooners, *Grande* and *Chica Besana* (Hackett 1931:352). Although he mentions numerous settlements in the region, most appear to have been along Bayou Teche west of the present project area, along the Atchafalaya River.

During the late 1700s, groups of Houma Indians began moving down Bayou Lafourche from their settlements on the Mississippi River near Burnside. This tribe had previously moved to Burnside from the Baton Rouge area (via Bayou St John at New Orleans) between 1709 and 1718 (Swanton 1911:289-291). Whether the Houma displaced some of the resident Chitimacha groups on Bayou Lafourche or simply occupied an area already abandoned by the Chitimacha is not clear. However, given that major Chitimacha settlements are known to have existed along bayous Teche and Plaquemine in the late eighteenth and early nineteenth centuries, it seems likely that the lands of the project area had been abandoned earlier by the Chitimacha in favor of these two locations.

The Houma settled initially along Bayou Terrebonne, principally in and around the present city of Houma. Oral tradition suggests that one main village, called Chufahouma, was established at that time (Bowman and Curry-Roper 1982:22). It is apparent, however, that the Houma were actually scattered across the region surrounding Houma. This is evident as the tribe filed a land claim with the U.S. government for "a tract of land lying on bayou Boeuf, or Black bayou, containing twelve sections" (Bowman and Curry-Roper 1982:24). Today, the claimed land is situated along that stretch of bayous Black and Boeuf between Houma and Morgan City. The claim was rejected, however, in 1814 on the grounds that an Indian tribe could not claim land that had reportedly been given them as a donation (Bowman and Curry-Roper 1982:24).

Additional evidence suggesting a dispersed settlement pattern comes from those land claims filed by individual Houma which were accepted by the U.S. government. Louis le Sauvage, Jean Billiot and his wife, Marie Nerisse, along with the latter's two sons, Jean, Jr., and Joseph, all were awarded land on lower Bayou Terrebonne which they had been occupying since 1787 or 1788 (Bowman and Curry-Roper 1982:24).

Throughout the late 1700s both the population and economy of the region continued to grow, principally in relation to the clearing of the land for agricultural purposes. Evidence of European settlement in the project area in the form of land grants first appears in the 1790s. During that decade several Spanish land grants were made in the northern portion of the project area. One of these grants was located along Bayou Black in Sections 103 and 104 of Township 17S, Range 17E (Figure 4). This land was originally claimed by Miguel Saturnino but was later sold to Robert Martin. Two other grants were located just south of this claim along Bayou du Large. Both of these were large tracts, almost a league on a side,

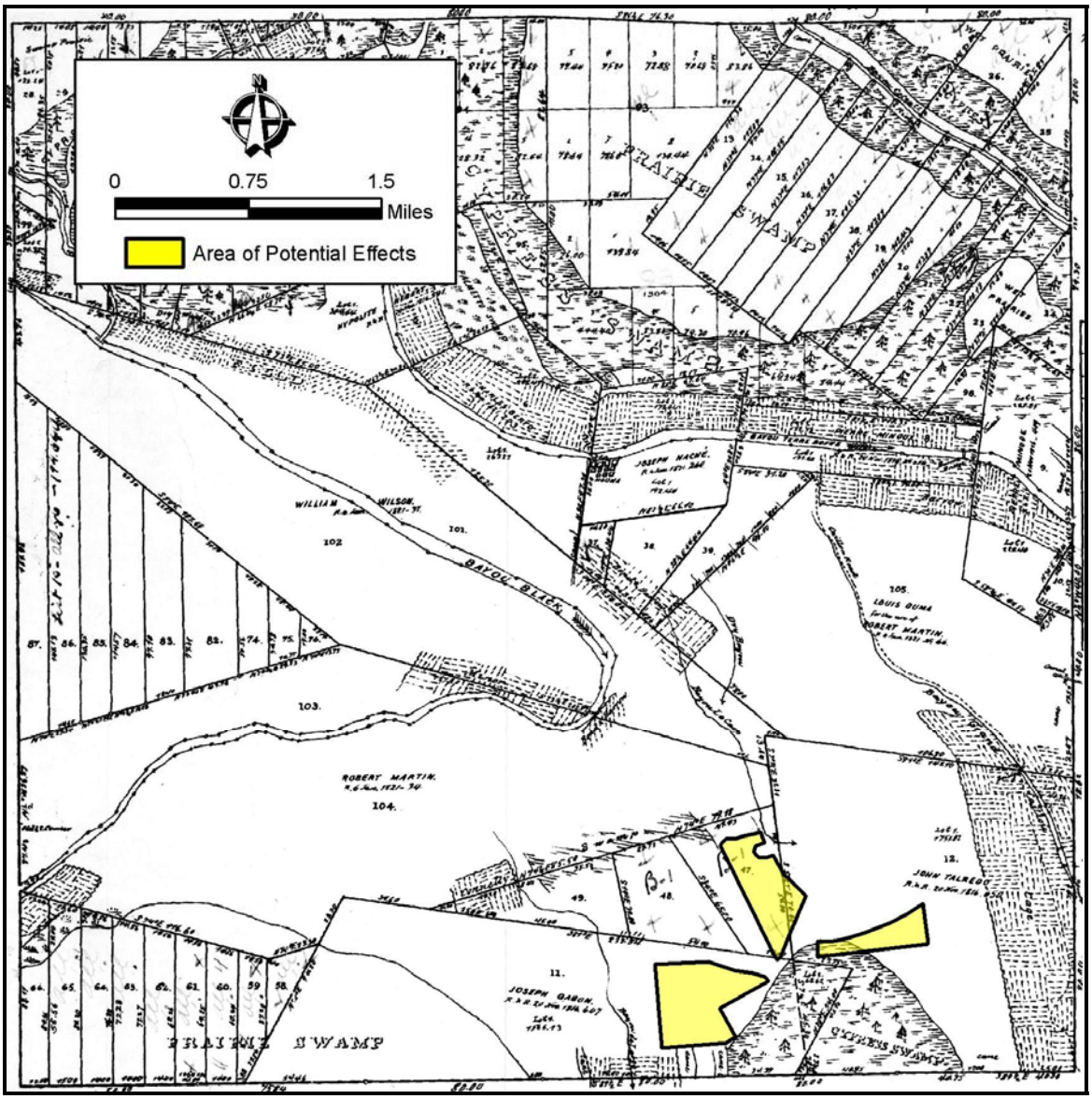

Figure 4. Plat map of Township 17 South Range 17 East (McCulloh 1855) showing the Area of Potential Effects for the present project.

similar to Spanish ranching grants, termed "sitios". One of these grants, comprising Section 11 in Township 17S, Range 17E and Sections 17 and 32 in Township 18S, Range 17E, went to Joseph Gabon (Figure 5). The other grant, consisting of Sections 18 and 31 of Township 18S, Range 17E, went to Joseph Felice. East of these two tracts along Bayou Grand Caillou were three other grants. The northernmost, comprising Section 105 of Township 17S, Range 17E was granted to Louis Duma (see Figure 4). South of it in Section 12 of Township 17S, Range 17E and Section 1 of Township 18S, Range 17E was another large tract granted to John Talredo. Joseph Talbo was granted the land south of Talredo's tract in Section 2 of Township 18S, Range 17E.

In 1803, the region was transferred from Spain back to France as the political situation changed through the ascent of Napoleon. However, both France's economic and

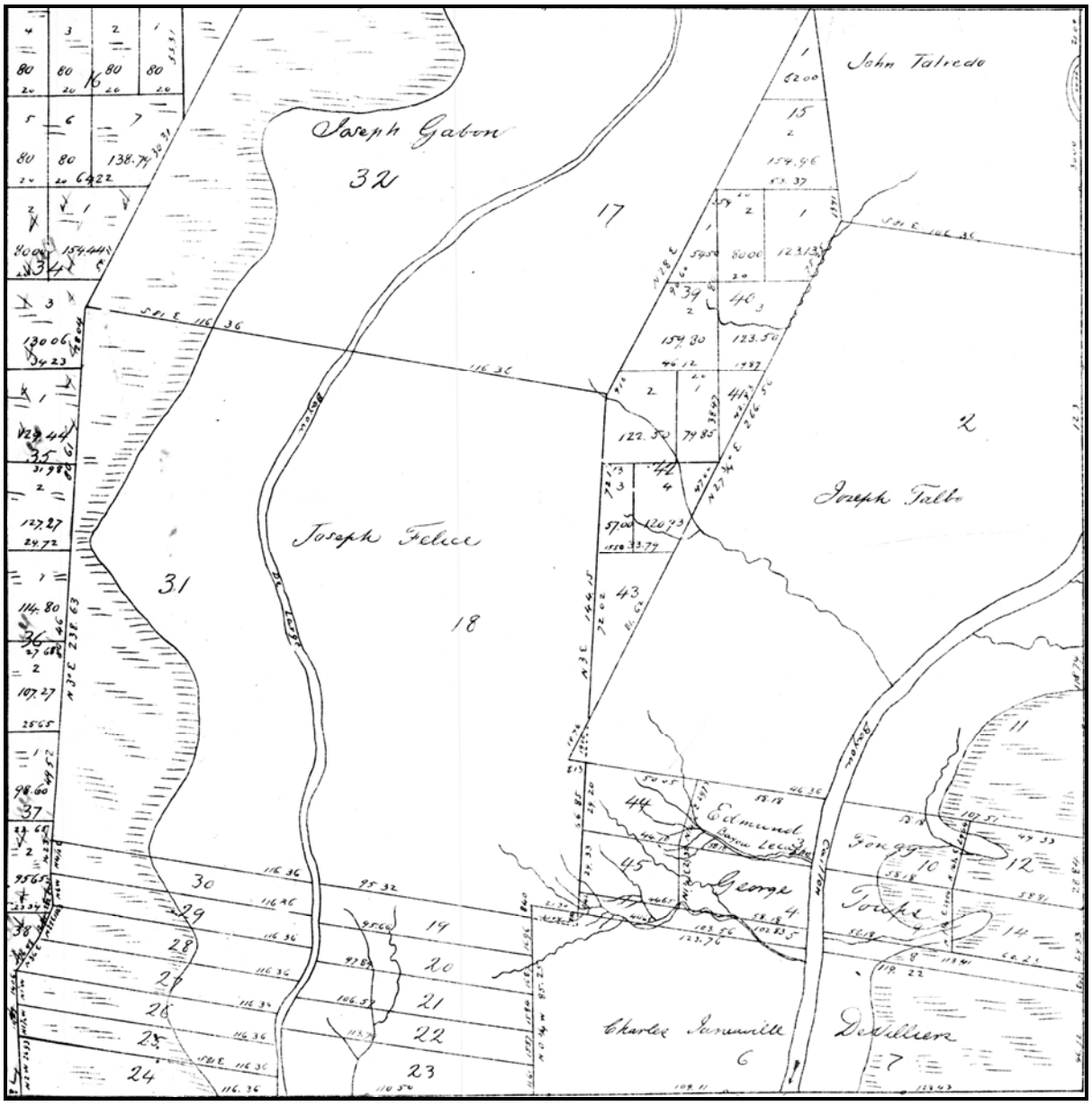

Figure 5. Plat map of Township 18 South Range 17 East showing the claims of Joseph Gabon, Joseph Felice, and Joseph Talbo on Bayous du Large and Grand Caillou (Righton 1831). This township lies outside the Area of Potential Effects for the present project.

political situation forced her to abandon much of her New World holdings in an effort to continue her clashes with England. Thus, later in 1803, France sold her immense Louisiana colony to the United States for $15,000,000. Not long after this sale, Anglo-American settlers began to move into the Lower Lafourche area. Many of these individuals acquired large tracts of land and established cotton and, later, sugarcane plantations. As a result, many of the original Acadian settlers moved to more isolated and, often, marginal areas and were forced to engage in other economies, such as fishing and trapping.

Louisiana was admitted to the Union in 1812, withstood the planned British invasion in December 1814 and January 1815 during the closing moments of the War of 1812, and

began to prosper as a rich agricultural state. Much of the high natural levees became the location for prosperous sugar plantations. In order to serve the expanding population, both prior to and after becoming a state, the region was divided into districts that, in turn, became parishes.

The project area was originally established as a part of the Lafourche District. In 1807, Assumption and Lafourche parishes were created out of the Lafourche District, and later, in 1822, Terrebonne Parish was created out of Lafourche Parish (Beavers et al. 1984; Goodwin et al. 1985a).

While the upper reaches of the parish received some settlers, most of lower Terrebonne remained a wilderness. Michel Theriot did not establish the first plantation on Bayou du Large until 1839. This sugar plantation would later become Theriot, the first town in Terrebonne Parish. As late as 1841, when the Robichauxs settled near Montegut on Bayou Terrebonne, the region was described as "a complete wilderness . . . and nearly all kinds of wild animals abound, deer, bear, etc." (Becnel 1989:12-13).

Two maps from the American period, one by William Darby in 1816 and the other by Captain Poussin in 1817 show sparse settlement in the region. Both maps record the location of "Renthrop's Ferry" at the junction of the Lower Atchafalaya River and Berwick Bay, and "Rice's" along the Atchafalaya at the junction of Bayou Boeuf (see Figure 3-2 for a more accurate location of Rice's Plantation in 1842). Poussin's map also records "Settlements" on "B. Derbone" (Bayou Terrebonne) near the junction of "B. Buffalo" (Bayou du Large). This can only refer to the initial occupation of the Houma vicinity.

The sugar boom at the end of the 1820s brought an influx of Americans into the region. The Lafourche Gazette reported in 1827 that "Upwards of fifty thousand dollars worth of wood lands on the Bayous Caillou, Black, etc., in the vicinity of the La Fourche, have been purchased during the past week by planters in the neighborhood of Natchez, for the purpose of being employed in the cultivation of sugar cane." (Tregle 1942:54). The population of Terrebonne Parish more than doubled from approximately 2,000 people in 1822 to 4,410 by 1840. The number of inhabitants had tripled to 12,091 by 1860, 56 percent of whom were slaves (Watkins 1939:53-54).

During the 1830s and 1840s sugar cane cultivation came to dominate the region. Terrebonne ranked seventh among the parishes in sugar production in 1844 and boasted 33 steam- and 10 horse-powered mills. Just a year later Terrebonne ranked sixth in the state and the number of mills in operation had almost doubled. The parish dropped to eight place in 1849 even though the amount of sugar produced had actually increased, and the number of mills grown to 92 (Watkins 1939:89-90).

In the midst of such enormous economic growth, it is not surprising that by the 1840s almost all of the original land grants in the project region had changed ownership. An 1846 map by John La Tourette, showing many of the large landowners in the state, gives a graphic depiction of land ownership in the project area during that period (Figure 6). On that map, Robert Martin's claim to Sections 103 and 104 (T17S, R17E) on Bayou Black has been divided into the properties of Bond & Barrow, John Boykin, John McCrea, Bernard, and Dr.

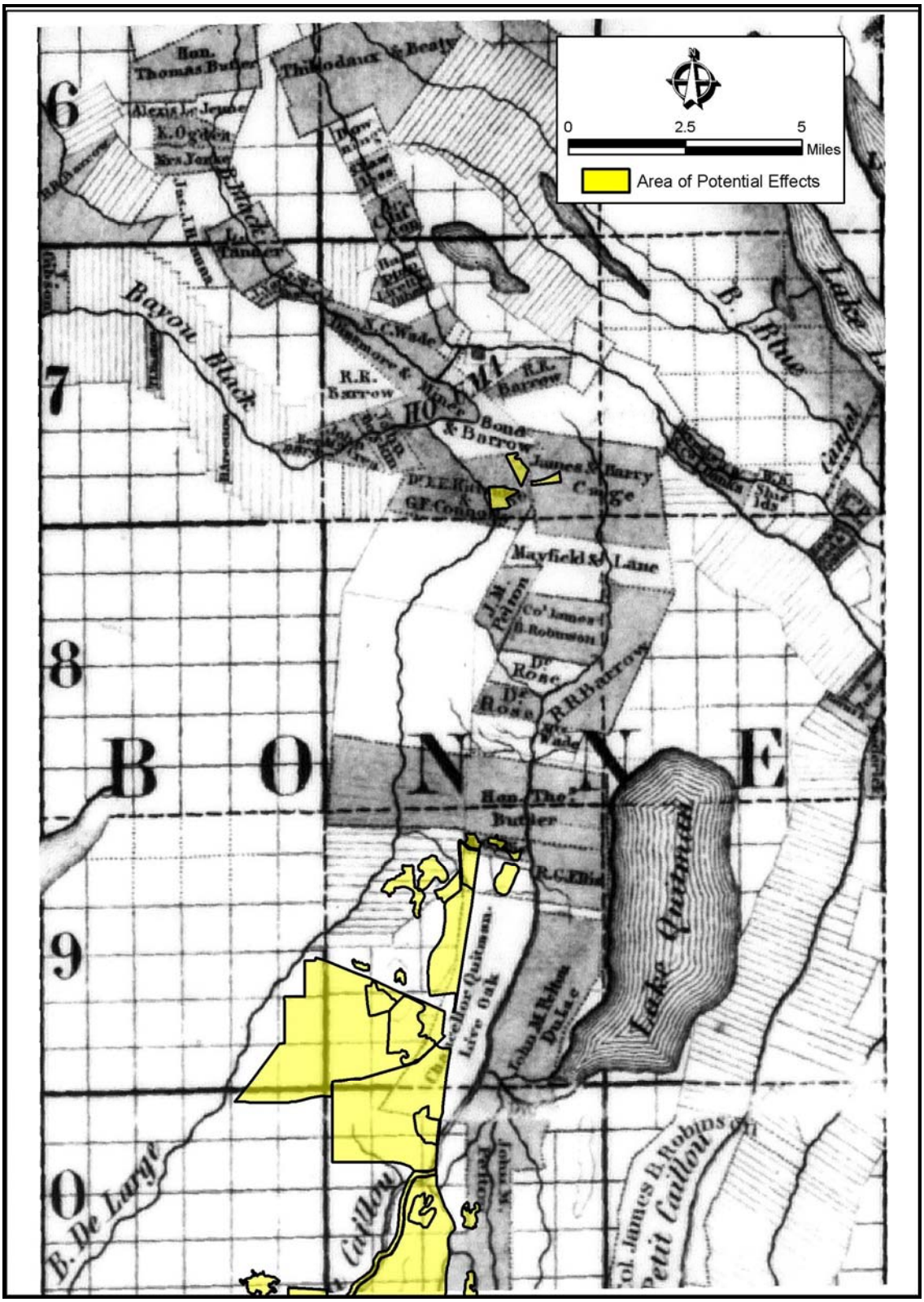

Figure 6. Detail of the La Tourette map of 1846, showing principal landowners on Bayou du Large, Bayou Grand Caillou and the eastern end of Bayou Black (La Tourette 1846), as well as the Area of Potential Effects for the present project.

E.E. Kitteridge & G.F. Connolly. The latter pair had also acquired the northern portion of Joseph Gabon's large claim (Section 11, T17S, R17E) as well as the previously vacant Sections 47, 48, and 49 (T17S, R17E). Barrow and Kitteridge and Connolly had acquired their tracts by 1844 and Boykins by 1847, according to the sugar records.

Robert Ruffin Barrow of J.B. Bond & Barrow was an Anglo-American planter who moved to Terrebonne Parish in the late 1820s from West Feliciana Parish where his family owned a number of large plantations (Floyd 1963:24). He quickly began acquiring land in Terrebonne Parish, some of it by rather unscrupulous means. Barrow filed several fraudulent claims for lands inhabited by Houma Indians (Bowman and Curry-Roper 1982:27) and purchased land from Robert Martin who had apparently acquired it illegally. Barrow's conflicts with the Houma reportedly led to his killing of several members of the tribe (Floyd 1963:24). He lived at Residence Plantation east of Houma on Bayou Terrebonne, but by the mid-1840s he owned or was a partner in five other plantations in Terrebonne Parish and one in Lafourche Parish, producing a total of over 1,500 hogsheads (Hhds) of sugar per year (Champomier 1846). Barrow was by far the largest sugar producer in Terrebonne Parish, and by 1860 he had become one of the wealthiest planters in the state with property valued at over $1,062,000 (Floyd 1963:24). Bond and Barrow's tract on Black Bayou was eventually called Crescent Plantation. It produced 400-500 Hhds of sugar during the 1840s and 1850s (Champomier 1845-1846, 1850-1859).

John Boykin's plantation on the old Martin claim, Nameoka, produced 168 Hhds of sugar in 1849-50. The following season he and a partner, Lang, used a steam-powered mill to turn out 250 Hhds. Boyd & Lang went on to produce 270 Hhds in both 1851-52 and 1852-53. Production then ranged from 215 to 425 Hhds between 1854 and 1862, excluding the bad season of 1856-57 when just 57 Hhds were raised. The Boykin in the partnership changed to E.M. Boykin in 1851 (Champomier 1850-1859; L. Bouchereau 1869).

E.E. Kitteridge, along with Robert Martin, represented his parish in state government in 1853. He served again the next year with J.B. Key (Watkins 1939-51-52). Kitteridge and J.R. Connolly raised 268 Hhds of sugar in 1844, 429 in 1845-46, and 240 in 1849-50 when they called their property Bayou Large. This partnership then disappears from the sugar records (Champomier 1845-1846, 1850).

Mayfield & Lane, Col. James, E. Robinson, Dr. Rose, and R.R. Barrow were the new owners of Joseph Talbo's land in Section 2 (T18S, R17E). J. M. Pelton had acquired most of Section 39, all of 40 and 41, and part of 42 (T18S, R17E), all previously unclaimed. Mr. Pelton's property is labeled as "Turner & Pelton's Plantation" on G.W. Hughes' 1842 "Map of a Military Reconnaissance and Survey of the approaches to New Orleans from the Gulf of Mexico".

Mayfield & J.A. Lane were producing sugar on their tract, called Ashland Plantation, by the 1849-50 season, which yielded 190 Hhds. The next year's yield using a steam-powered mill was 165 Hhds. The average crop between 1851 and 1858 was 258 Hhds, excluding the bad season 1856-57 when just 50 Hhds of sugar were produced. Mayfield was the sole owner of the plantation by 1856. Duncan S. Cage had acquired Ashland by the 1858-59 season and raised 417 Hhds of sugar. His yield had increased to 515 Hhds in 1861-62 (Champomier 1850-1859; L. Bouchereau 1869).

R.R. Barrow had acquired his part of the Talbo claim by 1844, perhaps from the William R. Butler listed in the sugar records for this location in 1831. William's output for that year was 53 Hhds of sugar. Thirteen years later, R.R. Barrow, in partnership with one Baker, produced 193 Hhds of sugar that season. Known as Caillou Grove, this property grew 134 Hhds of sugar in 1845-6 and belonged solely to R.R. Barrow (Champomier 1831, 1845-1846).

Thomas Butler had acquired the Devilliere tract (Section 1 of Township 19S, Range 17E) by 1844 probably from his relative "Judge Butler" who appears as the owner in the sugar records of 1831 with an output of 37 Hhds. Thomas increased the yield by 1844 to 408 Hhds. Brothers Thomas and Richard Butler worked the property the next year and raised 330 Hhds. By the 1849-50 season, Thomas Butler had died and his estate produced 436 Hhds of sugar. This property had a steam-powered mill by 1850-51 that yielded 308 Hhds. In the good seasons between 1852 and 1859 the crop ranged from 176 to 550 Hhds annually. However, in 1856-57 just 81 Hhds were produced (Champomier 1831, 1845-1846, 1849-1859; L. Bouchereau 1869).

The former grants of Jacques Lambez (Section 85, T19S,R17E), John Charles Terrio (Section 86, T19S,R17E), and Louis Cossier (Section 87, T19SR17E; Section 37, T20S,R17E) had been transformed into two large sugar plantations by the time La Tourette made his map. The west bank lands belonged to Chancellor Quitman and were known as Live Oak Plantation, while the larger Dulac (sometimes Bayou Dulac) Plantation on the east bank belonged to John M. Pelton, mentioned previously in reference to the Felice and Talbo claims. Dulac Plantation also included all or parts of Sections 10, 11, 22, 15, 16, 21, and 22 (T19S, R17E)—lands previously unclaimed.

Chancellor Quitman, called Capt. Quitman in the sugar records, owned his plantation by at least 1844 when he raised 295 Hhds of sugar. Production at Live Oak ranged from 205 to 434 between 1845 and 1859, excluding the bad season of 1856-57 when just 93 Hhds were raised. Governor John A. Quitman is listed as the property owner by the 1850-51 season and is operating a steam-powered mill by this time. He entered a partnership with his son F. Henry Quitman in 1855 that persisted to at least 1859 (Champomier 1845-1846, 1849-59).

John Anthony Quitman was a native of New York State but moved to Natchez, Mississippi where he studied and practiced law. He served as governor of Mississippi from 1835 to 1836 and 1850 to 1851. He also served in the Mississippi State house and senate, as a state court judge, and as a U.S. representative. While holding the latter office, Quitman was apparently deliberately poisoned during the inauguration banquet of President James Buchanan in Washington. D.C. He subsequently died on July 17, 1858 in Adams County, Mississippi near Natchez (Kestenbaum 2003).

John Quitman bought property in Terrebonne Parish in 1829, 1833, 1834, 1837, and 1838; although, he never appears to have resided there. In 1838 he purchased the eastern half of the Lambez grant from James Bowie who had acquired it from Jacques Lambez. In 1855 John passed one-third of Live Oak plantation to his son, F. Henry Quitman, who lived there in a colonial residence known as Quitman Place.

Dulac Plantation, opposite Live Oak on Bayou Grand Caillou, belonged to John M. Pelton by at least 1844 when he raised 750 Hhds of sugar. Large yields of between 410 and 825 Hhds were the norm on Dulac from 1845 to 1861, again excepting 1853-54 when just 317 Hhds were produced (Champomier 1845-1846, 1849-59; L. Bouchereau 1869).

On the Banks map of 1863 (Figure 7), the names of some of the original claimants persist. However, some obviously contemporary owners and their homes are shown as well. Mr. Connolly and Bond & Barrow's cane fields appear in Section 103; although former claimant "Rob Martin" is listed there as well. A structure appears on the Bond & Barrow tract. Sugarcane fields are clearly shown along bayous Grand Caillou, du Large, Grassy (Four Points), and Petit Terrebonne (Black), as well as several short man-made canals.

From the 1840s until the outbreak of the Civil War in 1861, the lands within the project area continued to develop into sugar-producing plantations and small farmsteads. Over 100 large sugar plantations with 80 sugarhouses were in production in Terrebonne Parish by 1851. The greatest impact on the region was to come in the form of the New Orleans, Opelousas, and Great Western Railroad, designed to link New Orleans with western Louisiana. By the early 1850s, the railroad had acquired rights of way for much of its proposed route across Tiger Island (Goodwin et al. 1985a:53). Land on the western end of the island had been acquired during the 1830s and 1840s by Dr. Walter Brashear (Goodwin et al. 1985a:43). Brashear donated his lands to his children, Robert B., Thomas T., and Francis E. Brashear in 1842 (Goodwin et al. 1985a:46), and in 1853, they had a plan drawn up to divide their holdings into lots within the "Town of Brashear" (Goodwin et al. 1985a:58, Fig. 7). In March 1860, the inhabitants of the town petitioned the Louisiana legislature for incorporation status. This was granted and Brashear City became a reality (Goodwin et al. 1985a:60).

At the northern end of the project area, the town of Houma began to grow as more and more settlers moved into the area. Originally established around what is believed to have been one of the Houma Indians' principal villages, the town developed on land claimed by Joseph Hache in Section 7, Township 17S, Range 17E. In 1832, Houma became Terrebonne's parish seat (Work Projects Administration [WPA] 1941:390); although, the first actual buildings in town were not erected until 1834. Prior to this date, Williamsburg (now Bayou Cane) about four mi west of Houma had served as the parish seat.

By 1841, Houma still consisted of just "three or four little houses" (Becnel 1989:12-13) that were confined to the south bank of Bayou Terrebonne. While incorporated as a city in 1848, Houma's corporate limits were not expanded to include the north bank of the bayou until 1899 (Castille 1983:2). G. N. Pierce (reprinted in Walkins 1939:106-107) described the town in 1851 as a:

> …considerable village,…consist[ing] of five stores, ten or twelve dwelling-houses, a church (Methodist), a blacksmith shop, a schoolhouse, a hotel, a grog-shop and billiard room, together with the paraphernalia of justice—such as the

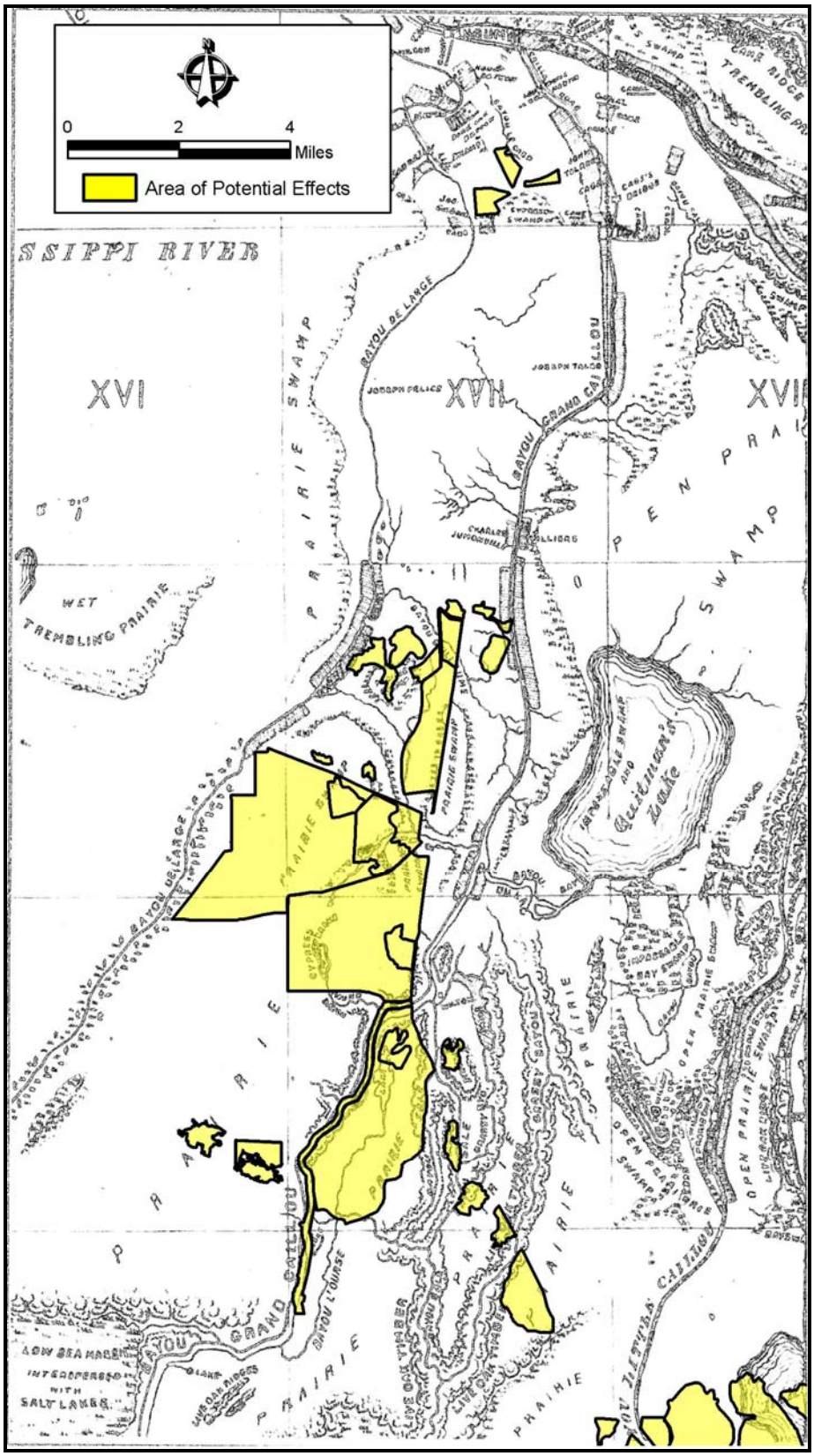

Figure 7. Banks map of 1863, showing landowners, structures, cane fields, and canals in the project area (Banks 1863).

> courthouse, Clerk's, Sheriff's and Recorder's offices, (all in one building) and a jail. Offices here, though elective, are hereditary, and descend from father to son, or in default, to collateral relations; and here appears to be antagonism between the American and Creole part of the population.
>
> There are also in this place sundry lawyers' and doctors' offices.

In 1861, Louisiana seceded from the Union and joined the Confederate States of America. Early in the war, New Orleans and Baton Rouge were occupied by Union troops and became staging areas for expeditions into more remote portions of the state. Union forces moved into the present region in October, 1862 under the command of Brigadier General Godfrey Weitzel. Included in the force were four gunboats, *Estella*, *Calhoun*, *Kinsman*, and *Diana* (Goodwin et al. 1985a:62). With the gunboats patrolling the Atchafalaya River and Bayou Teche, the Union troops occupied Brashear City and built additional fortifications.

In June of 1863 the Confederates launched a waterborne assault on the north bank of Tiger Island and captured Brashear City by approaching from the east (Goodwin et al. 1985a:64). At the same time, Confederate forces marched westward from Thibodaux along the railroad line and captured the fort at Boeuf Station (Bergeron 1985:203).

Confederate control of the region was short lived, however. On July 9, 1863, the Confederate forces at Port Hudson surrendered, freeing the large Union siege force for action in south Louisiana. Fearful that Confederate forces would be trapped east of the Atchafalaya River, Major General Richard Taylor, commander of Confederate troops in south Louisiana, ordered all his forces west of Berwick Bay to Bayou Teche. This retreat left the region open to Union forces, which moved in shortly thereafter (Bergeron 1985:204).

Following the Civil War, a period of economic stagnation developed that lasted throughout much of the Reconstruction era. In the project area, only John M. Pelton of Dulac Plantation and C.S. Cage of Ashland were able to retain their properties through the war. Pelton also seems to have acquired adjacent Live Oak Plantation from the Quitmans. Yet both Pelton's large plantations only produced about one-sixth of his pre-war sugar yields in the 1868-69 season. That same year, Cage's sugar production dropped by almost 50 percent to 280 Hhds, and he had also raised 20 barrels (Bhls) of rice. All but one of the plantations in the project area were using steam power and open kettles at this time. All the sugar houses but Pelton's were made of wood, while his was brick and had a shingled roof (L. Bouchereau 1869).

Bond and Barrow's Crescent Plantation on Black Bayou belonged to Dr. A. Helmick in 1868 and produced 255 Hhds of sugar. Boykin's Nameoka had passed to J.C. Jackson, had no sugar apparatus at all, and grew 10 Bhls of rice. LMT McClung & Company owned Robinson's Cedar Grove by this time where 39 Hhds of sugar and 15 Bhls of rice were grown. Both Caillou Grove and Ellislie plantations had been acquired by Ewing Chapman by 1868. That year he grew 54 Hhds of sugar on Ellislie and 77 Hhds of sugar plus 15 Bhls of rice on Caillou Grove. Finally the Blanchard and Rancon farm belonged to J. Lapene & Company and produced 169 Hhds of sugar (L. Bouchereau 1869).

Over the next two years R.G. Ellis briefly regained Ellislie. Likewise, R.R. Barrow was able to buy back Caillou Grove and E. M. Boykin his Nameoka, both in partnership with J. Lapene. Pelton sold Live Oak and Dulac plantations in 1872 to G.D. Cragin. The Barrows returned to Crescent Plantation on Black Bayou in 1875 in conjunction with Peter Berger. Meanwhile Ellislie and Live Oak had been absorbed by J. Lapene. By 1876, the only pre-war owners in the project area were Duncan S. Cage at Ashland and Boykin at Nameoka. Boykin finally sold out in 1880 while the Cage family held out until 1887. The project area properties then moved through several hands as tracts were subdivided and some renamed (A. Bouchereau 1880, 1887; L. Bouchereau 1869-1876).

Reconstruction in Terrebonne Parish was followed by a period of economic growth and renewal in the last few decades of the nineteenth century. This upswing was due to innovations in agricultural practices, such as artificial rice irrigation, the application of new scientific techniques to cane and cotton farming, the discovery of oil and sulphur in the southwestern parishes of the state, and the growth of the lumber industry, which was spurred by the completion of several railroad systems.

The clusters of buildings considered typical of sugar plantations appear along Bayous Black and Grand Caillou on the 1892 USGS quadrangle maps (USGS 1892a, 1892b). In 1891 the great Terrebonne Sugar Mill opened at Montegut (Wurzlow 1985:VII:58), and by 1900 three sugar mills were in operation along Bayou Grand Caillou. The one on Dulac Plantation, then owned by the Widow F. Lottinger, was destroyed by a hurricane in 1909. Likewise, the hurricane of 1926 demolished the mill at Live Oak Plantation. The Ashland sugar mill shut down in 1930.

Two saw mills also operated briefly along the bayou, one on Dulac Plantation at Goatfield, the old name for the point of land the Coast Guard Station now occupies, and the other on Live Oak Plantation. The former mill had a capacity of 15,000 board feet per day, while the latter mill had closed by 1897 (Terrebonne Parish Directory 1897). Logs were dragged by pullboats to the nearest canals and then floated to the sawmill. Pullboat scars radiating out from Forty Acre Bayou (a logging canal) are still visible on a 1956 aerial photograph in the southwest portion of the Talbo grant, then known as Cedar Grove Plantation. Similar scars appear along the western edge of the old Lambez claim on Live Oak Plantation (Amman International Corporation 1956:245A). Grand Caillou timber was floated westward to Morgan City.

Cedar Grove Plantation on part of the old Talbo grant (Section 2, T18S, R17E) belonged to Blum & Cantrelle in 1891. Manager and overseer, T. A. Prevost, and his assistant, Albert Cantrelle, had 250 acres in cane and 130 in corn that year. Ashland, also on part of the Talbo grant, belonged to Caillouet & Maginnis. W. R. Darden served as overseer assisted by E. J. Richard. Coopers Oscar and Fred Robichaux were also employed there (Terrebonne Parish Directory 1897).

On the old Fongg, Toups and Devilliere grants in 1891 were J. B. Leblanc's small plantation with 25 acres in cane; Cane Brake Plantation owned by Louis Waguespack; the home of Luke Lecompte, a carpenter; Grand Caillou Plantation; and the farm of Luke Boudreaux. The Cambon Brothers operated Grand Caillou Plantation and store, while Luke Boudreaux also ran a store with his clerk W. T. Raby. Boudreaux had 200 acres in cane and

a 100 in corn in 1891. Joseph W. Martin owned Live Oak plantation by this time, and employed Anatole Boudreaux as engineer and blacksmith. Manager E. J. Engman had 170 acres in cane and 60 in corn that year. In 1896, the Live Oak sugar mill on the banks of Bayou Grand Caillou produced 245,000 pounds of sugar. Dulac plantation and store belonged to Mrs. Frederic Lottinger by 1891 and covered three thousand acres, 550 in cane and corn.

While not the first town established in Terrebonne, Houma soon became the largest and has remained the principal urban center in the parish to this day. The Houma oyster first made its mark on the national market in 1895. Fifteen years earlier in 1880 the Baltimore oyster dominated the trade and the industry supported 24,000 workers. Oysters were a principal protein component in the diet of many people in the eastern seaboard cities. Baltimore production reached an all-time high in 1884 of 15,000,000 bushels. However, beginning in 1895 the Houma oyster business grew exponentially, shipping a million bushels by 1901 while the Baltimore oyster yield declined to 6,000,000 bushels.

In 1901 when Houma businessmen first gathered to push for a deep water route to the Gulf, they noted that 600 luggers were engaged in the oyster trade but had great difficulty getting their produce to Houma, the nearest rail junction. The oysters were unloaded from luggers by air suction and sent to the steamer by conveyer to be brined and cooked in the shell. They were then mechanically shucked (Wurzlow 1985:VIII:97). With a six-foot channel the Houma businessmen argued, the city's oyster business could export 250,000,000 oysters a year. With ten feet of water the town was predicted to become a second Baltimore (Glass 1901:19). By 1905, Houma had indeed become one of the largest oyster shipping ports in the world, exporting both fresh and canned oysters. At least 12 oyster shipping and packing companies were in operation in Terrebonne by 1910 (Lockport Rotary Club 1994:11). The first shrimp-canning factory opened in Houma in 1924 (Castille 1983:2). Shrimping using the gas-powered trawler quickly became an important business and remains so today.

Houma's population grew steadily throughout the historic period, but in the 1920s and 1930s, the city experienced rapid growth due to the discovery of oil and gas in Terrebonne Parish (Castille 1983:3). Terrebonne became the gateway to the heaviest concentration of offshore oil service companies in the state. By 1960, the combination of rich oil production backed by Houma's productive waters, fertile soil and natural mineral resources enabled Houma to become one of the fastest growing cities in America (Barton et al. 2003). By the late 1970s, Houma's main focus was the oil industry. When the bottom fell out of the industry in the early 1980s due to cheaper foreign product and dwindling local resources, Houma also declined. For nearly two years the Houma-Terrebonne area experienced an unemployment rate near 25 percent. While oil remains the bulk of the parish economy today, Terrebonne also produces over 20 percent of Louisiana's seafood (Barton et al. 2003).

Oil and gas exploration, both in the marshes and swamps of the region and offshore in the Gulf of Mexico, has led to the alteration of much of the area's landscape. Extensive oil-rig fabricating yards have developed along Bayou Boeuf and Bayou Black, reworking and destroying much of the earlier cultural evidence, both prehistoric and historic, for those

areas. Hundreds of miles of canals have been dredged for both well sites and pipeline routes, and saltwater has begun to move up these canals destroying large expanses of freshwater marsh. With the loss of the marsh grass, the terrain has broken up and vast areas of open water have developed. Between 1955 and 1978 Terrebonne Parish lost over 116,000 ac of land area due to a combination of subsidence, shoreline erosion, and the breakup of marsh (Wicker et al. 1980).

The status of the native Houma population in Terrebonne Parish was documented by Edison Roy, a graduate student at Louisiana State University, in 1959. The Board of Missions of the Women's Division of Christian Service of the Methodist Church had requested LSU's assistance in evaluating their Indian Missions program in the Dulac community. They estimated 200 Indian families lived in the Dulac community at that time. Other semi-isolated Indian communities existed at "Lower" du Large, L'Isle de Jean Charles, Point aux Chenes, and "Lower" Montegut (Roy 1959). Seventeen years earlier in 1942, a Houma village of palmetto huts and houseboats persisted on Bayou Terrebonne (Hebert 1978:xxvii).

Roy found that 45 percent of Dulac area residents were white ("Cajuns") and the remainder primarily of Indian and French ancestry. About 10 percent were tri-racial. Homes were located along both sides of the roads running parallel to Bayou Grand Caillou and the population was evenly distributed on each side of the bayou. While all the whites owned their own homes, only 40 percent of the Indians did. About 25 Indians families (19 percent of the Indian population) lived in houseboats dry-docked on the banks of Bayou Grand Caillou and paid rent to a landowner. In 1959, all the Dulac Indians spoke French and only six percent were bilingual. (Roy 1959).

The Indians often temporarily migrated for employment. As the shrimp factories owned most of the boats, the Indians had to go where ever the packers ordered. There were proportionately fewer females in the Indian population, as they often married whites and left, while the males remained to shell fish. Schools were strictly segregated with white children at the school north of Grand Caillou and the Indian children at "Dulac Indian." A separate school was provided for black children. In the surrounding parishes, however, Indian children were sent to the white schools. Churches were slightly less rigidly segregated in Dulac, with two Catholic churches, one primarily white and the other primarily Indian. The Methodist, Baptist, and Church of God congregations were majority Indian. In 1959 Dulac had 20 grocery and dry goods stores, seven shrimp packing plants, one theater, several beer parlors, two white dance halls, and two Indian dance halls. The first paved road from Houma to Dulac opened in 1958. Max Stanton, another MA student from L.S.U., identified 1,226 Indians living in Dulac in 1960. While whites lived primarily in Grand Caillou and blacks in Bobtown at the upper end of the project area, all the towns along Bayou Grand Caillou were multi-racial at this time (Stanton 1971). The Dulac schools were integrated in 1965.

Most of the Dulac Indians today continue to work in the seafood industry, principally at the seafood processors. However, this work is seasonal, resulting in long periods of unemployment (Alice Rothrock, personal communication to Joanne Ryan 2003). The Houma Navigation Canal and the lack of levees on Bayou Grand Caillou have resulted in serious flooding in the Dulac area in recent years (Magnus Voisin, personal communication

to Joanne Ryan 2003). In 1992, Hurricane Andrew left five feet of water in the Methodist Community Center parking lot, while Lili in 2003 deposited 2.5 ft. Funding from the Federal Emergency Management Agency has allowed most homes in Dulac to be raised or rebuilt. The Indian community remains deeply concerned about the eventual loss of their homes and livelihood due to the perpetual cycle of storms and subsequent erosion (Alice Rothrock, personal communication to Joanne Ryan 2003).

The Water

Travel by boat was a way of life for those who lived along the bays and bayous in lower Terrebonne Parish. Natural waterways are numerous and, until relatively recently, trails and roads were few and those that existed were muddy and impassable much of the time. During the historic period, it was normally only by boat that one could travel reasonably within the region and reach outlying communities and fishing spots, oyster beds and shrimping grounds. Even during the prehistoric period, travel by boat would have been common. The dugout canoe, or *pirogue* as the French called it, was the watercraft used by the area's native populations and it was adopted by the later European settlers. Dugout canoes generally were constructed of a single cypress log and could measure over 30 ft long (Pearson et al. 1989b). The preserved remains of several prehistoric and early historic period dugout canoes have been found in coastal Louisiana; although, none is reported from the immediate vicinity of the project area. The numerous prehistoric shell middens along the relict stream channels of the lower Terrebonne region suggest canoes were extensively used not only to reach settlements but also to collect shellfish, fish and other food resources.

With the establishment and growth of European settlements in the Terrebonne area, the need for watercraft to move merchandise and people increased. Several bayous in the HNC Deepening Project area became important commercial water routes. Bayou Grand Caillou developed into an important navigation route from the Gulf of Mexico into the interior and the town of Houma was established at the head of navigation on Bayou Terrebonne. Bayou Petit Caillou, also, became an important route of travel for commercial watercraft.

A variety of small vessels came to be used in travel and commerce along the region's waterways. In addition to pirogues, these included locally built craft such as *chalands*, *esquifs* and *bateau*, all of which were small, flat bottomed and shallow drafted, and well adapted to the shallow, often winding waterways of the region (Knipmeyer 1956). Over time, larger watercraft such as flatboats, luggers, sloops, steamboats and, perhaps, keelboats came into use (Birchett and Pearson 1998). These vessels were used to move people and to carry the commodities of the region to market, which normally meant travel to New Orleans or to an intermediate location such as Houma, Thibodaux or Donaldsonville where goods were transshipped. During the nineteenth century, commodities moving out of the region included cotton, corn, indigo, molasses, rice, sugar, tafia and lumber (Gould 1951). Sugar, for example, was carried to New Orleans in "pirogues, skiffs, or boats made from solid logs. Each planter has his boat and, . . . could send his crop to market in it -- a few hogshead or bales at a time" (Gould 1951:211). Poor records make it difficult to determine the amounts of Louisiana sugar, molasses and rice delivered by these small "plantation boats," but during the early years of settlement, it was substantial. Larger vessels, specifically sailing sloops,

schooners and, later, luggers became increasingly involved in this trade. Although much of the trade was along inland waterways, many vessels sailed along the coast in the Gulf of Mexico. These vessels utilized the passes leading into Terrebonne Bay, including Cat Island Pass now part of the Houma Navigation Canal, and many would have traveled into and out of bayous Terrebonne, Grand Caillou and Petit Caillou.

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Prior to the introduction of the steamboat in the area, flatboats or flats were the major types of commercial craft in use on the inland waterways. One particular type of flatboat was the "cordelle" boat which was simply a flatboat pulled with a rope by men, horses or mules using towpaths worn into the natural levee (Butler 1985). Sailboats were cordelled along bayous, as well, and were also pushed with a pole (Wurzlow 1985:I:154). Even after the introduction of steamboats, flatboats continued in use and, in fact, increased in number after the Civil War. The flatboat was well suited to the narrow and shallow waters of the bayous. In addition, they were cheap and offered an inexpensive means of carrying bulky freight to market. As can be seen, life and transportation revolved around the water. Even in death, funeral corteges often traveled via the pirogue. One such event was recorded in a cortege from L'Isle de Jean Charles to a church at Point aux Chenes when the deceased traveled in the first pirogue followed by mourners in their pirogues. In fact, the only way to reach L'Isle de Jean Charles was by boat until after World War II (Wurzlow 1985:V:32).

Relatively little information is available on the early sailing vessels serving the Terrebonne area. Probably typical of those sailing in the 1830s was the sloop *Exchange*. The *Exchange* was a small, 40-ft-long vessel with a burden of just 27 9/95 tons. Surprisingly, the *Exchange* was built far inland at Lawrence, Ohio in 1833, but in 1834, she was owned and sailed by Elisha Roundtree of "Terrebonne" (Work Projects Administration [WPA] 1942:3:77). Records indicate that some of these early sailing vessels were built locally. Among these was the sloop *Zulma*, which was constructed on Bayou Black in Terrebonne Parish in 1835. The *Zulma* measured 57 ft, 6 inches long and had a burden of 71 82/95 tons (WPA 1942:3:230-231).

Steamboats began to serve the Terrebonne area by the 1820s. One of these early steamers was the 116-ft *Paragon*, built in Ohio in 1830. In 1836, the *Paragon* was owned by two Terrebonne Parish residents, Joseph L. Carothers and J.B. Harris, and homeported at the "port of Terrebonne." The steamer's captain was J.D. Spear (WPA 1942:3:168). A small number of steamboats were built in the Terrebonne region. Among these was the 113-ft *Live Oak*, built on Bayou Black in 1845. The *Live Oak* was originally owned by residents of "Tigerville" in Terrebonne Parish but soon was acquired by a New Orleans resident (WPA 1942:4:163). The *Paragon*, the *Live Oak* and other small steamers, together with small sailing vessels, connected the Terrebonne area with New Orleans, carrying sugar and other local produce, merchandise and passengers.

During the Civil War, Confederate authorities constructed a small earthwork fortification on Bayou Grand Caillou to prevent Union access along the bayou into the interior of Terrebonne Parish. Known originally as Fort Butler and later as Fort Quitman, the fortification was situated on the west bank of Bayou Grand Caillou immediately below the mouth of Mound Bayou. In December 1861, Confederate General Lovell reported that Fort Quitman was armed with two 32-pounder guns and manned by two companies. After the fall of New Orleans, the guns at Fort Quitmen were spiked, the powder thrown into the bayou

and the men withdrawn because of a fear that the fort was vulnerable from Union attack from the rear (Official Records of the Union and Confederate Armies in the War of the Rebellion [ORA] 1882:656, 774).

Shortly after the start of the war, the Union blockade of the Louisiana coast suppressed most commercial maritime activity in the region. However, the coastal area was used by some blockade runners. Most of these blockade runners were small sailing vessels and little is known about them, but a few larger steamers also attempted to sneak in or out of the Terrebonne area's myriad of waterways. One of the sailing vessels that tried to run the blockade into the Terrebonne area was the 90-ft schooner *Major Barbour* (Official Records of the Union and Confederate Navies in the War of the Rebellion [ORN] 1903:88; WPA 1942:5:165). In February 1862, the Union blockading vessel USS *DeSoto* captured the *Major Barbour* "inside of Isle Derniers" as the schooner was attempting to run the blockade from Havana. The *Major Barbour* was carrying a valuable cargo, including gunpowder and percussion caps (ORN 1903:88). Considering its point of capture inside of Isles Dernieres, it appears as if the schooner was in the vicinity of Lake Pelto or western Terrebonne Bay, possibly attempting to enter one of the bayous there such as Petit Caillou or Sale. In the same month, a Union report appeared stating that the blockade runner *Miramar* had come in at the "Grand Caillou," presumably referring to Bayou Grand Caillou (ORN 1921:683).

There are reports that Union forces captured a "Rebel schooner" named *Fox* in Bayou Grand Caillou in May 1862. The accounts of this capture are vague and nothing else is known about this vessel but she apparently was being used as a blockade runner (ORA 1893:451).

Blockade running and smuggling remained active in the lower Terrebonne area during most of the war. In 1864, Union officer Captain Moore was sent to Bayou Grand Caillou to try to locate and break up a group of Confederate smugglers. Raids were planned and carried out resulting in the destruction of a considerable amount of food and equipment and a few small boats along the bayou. One boat mentioned that was not captured by Captain Moore was a small schooner being used as a blockade runner. Apparently, Captain Moore and his men were supplied with liquor, became intoxicated and were captured by Confederate forces along Bayou Grand Caillou (ORA 1893:927-929, 932). .

Although most of these blockade runners were small sailing vessels, a few larger steamers also attempted to sneak in or out of the area's myriad of waterways. For example, in February 1862 the sidewheel steamer *Victoria* was driven ashore near Fort Livingston by Union ships as she attempted to enter Barataria Bay (Pearson 1993:474).

Confederate naval activity was minimal in the immediate vicinity of Terrebonne Bay and appears to have been confined to scouting and patrol duty. For example, in September 1861, the small Louisiana state "War Schooner" *Antonia* was ordered to the "Timbalier Islands" to assist two schooners "loaded with arms for the State or for the Confederacy" (Pearson 1993:472). It is not known where, or if, the *Antonia* found these vessels. Later, in November 1861, the *Antonia* was sent to Brush Island to remove or destroy any cattle that might be there to prevent Union forces from obtaining them. Brush Island was located in lower Terrebonne Bay immediately north of the Timbalier Island remote-sensing survey area. The island has almost entirely disappeared in the last 20 years. The *Antonia* spent

some amount of time patrolling this portion of the Louisiana coast attempting to aid blockade runners and searching for local citizens who might be communicating with the enemy blockade ships (Pearson 1993).

In April 1865 during the closing days of the war, Captain J.A. Rhodes provided a description of travel down Bayou Grand Caillou aboard a schooner bound for New Orleans with a cargo of molasses. Captain Rhodes was to protect the schooner from capture and he wrote:

> April 20, left Houma at 9 a.m. and arrived at Pelton's plantation at 3 p.m., seventeen miles below Houma, where we found the schooner waiting for fair wind, the wind being ahead, and hence we were obliged to encamp at Pelton's for the night. Next morning, the wind being favorable, everything was got in readiness for the trip. Taking fifteen men and leaving the balance in charge of the horses until our return, we embarked on the schooner at 10.30 (April 21) and proceeded down Grand Caillou toward the Gulf, a distance of seventeen miles, where, owing to the darkness, we were obliged to anchor for the night. April 22, got the vessel under way at sunrise and continued our run down the bayou. We arrived at the mouth of Grand Caillou at 9 a.m. and went outside with the schooner, seeing her safely over the bar, some six miles at sea. No rebels, or any signs of them, were seen during the entire course. At 10 a.m. we left the schooner in a small sail-boat, which was taken from Mr. Pelton's plantation for the purpose of conveying us back again. The wind being ahead, we were compelled to beat the boat back into the bayou. After hard pulling and towing the boat with a rope from the bank, we made some seventeen miles, and went into camp on the bayou at the house of an old Frenchman, where we were refreshed with supper and a good night's rest. April 23, at 9 a.m. we resumed our course for Pelton's plantation, which we finally reached after six hours' hard pulling against wind and tide. Mr. Pelton was glad to see us on our return, and served up a good dinner to both officers and men. Possessing a plenty with which to accommodate both men and horses, he insisted on our remaining with him all night, and the men being very tired I cheerfully accepted his proposition [ORA 1896:185].

It was not until several years after the Civil War that waterborne commerce in the lower Terrebonne region revived. Steamboats, which had begun to travel the waters of the area in the third decade of the nineteenth century, became increasingly important as carriers of goods and people (Birchett and Pearson 1998). Bazet (1934:37) reports that the *S.F. Archer* was one of the first steamers to operate exclusively in Terrebonne Parish. Built along the Ohio River at New Albany, Indiana, in 1854, the sidewheeler *Archer* was owned by J.J. Schaffer & Company and traveled along Bayou Black making connections with the railroad at Tigerville (Way 1994:407). Other steamers operating in the region after the Civil War were the *Harry, Laura,* and *Sadie Downman* and the *N. H. Breaux,* to name just a few. The *Harry, Laura* and the *Sadie Downman* belonged to the Daigle Barge Line whose founder was Emile A. Daigle. The *Harry* and the *Laura* were the first big steamers on Bayou Terrebonne in 1881 and also plied bayous Petit and Grand Caillou (Lockport Rotary Club 1994:26). The *Laura* seems to have been the 68-ft-long sidewheel steamboat built at Houma in 1874 (Way and Rutter 1990:142). The *Sadie Downman*, a 110-ft sternwheel towboat, was built at New Iberia in about 1901 and had originally been named *Joseph A. Breaux*. The *Sadie Downman*

remained in service until 1913, the year she burned at Houma (Way and Rutter 1990:197). These steamers mainly carried freight and would haul barges loaded with lumber and sugar and produce to Houma from where cargoes would be shipped on to New Orleans. On their return trip, they carried groceries, dry goods and other supplies to plantations and merchants in Terrebonne. In the early steamboat days, Emile Daigle would dredge Bayou Terrebonne in Houma at his own expense to keep his boats running. He also had a wharf in town where he built barges and had a crew of painters and carpenters to maintain his boats. Emile Daigle had a large interest in the drayage business and owned several landings and wharfs along the Terrebonne by 1910. He was a charter member of the Houma Fish and Oyster Company and had an interest in an oyster shop at Sea Breeze (*Houma Daily Courier*, Sept. 26, 1971).

The steamers *Harry* and the *Laura* also towed long strings of barges loaded with "Beaumont" oil:

> Sometimes you could see as many as eight or 10 barges trailing behind one of the big boats. The last barge had a long chain dragging an anchor to keep the tow from swinging. You could always tell where the anchor was by the stream of bubbles [*Houma Daily Courier*, Sept. 26, 1971].

The *N. H. Breaux*, a 102-ft-long sternwheeler that succeeded the *Laura*, is reported to have been the last steamer operating on Bayou Terrebonne in 1930. Built at Patterson, Louisiana in 1925, after leaving the Terrebonne area the *N. H. Breaux* continued working until 1944 when she was destroyed by fire at Lockport, Louisiana (*Houma Daily Courier*, Sept. 26, 1971; Way and Rutter 1990:169).

By the late nineteenth century, railroads had increasingly begun to replace watercraft as carriers of commerce in the region. The speed and reliability of railroads, relative to sail and steam vessels, were major reasons why shippers were attracted to them. This speed was particularly important in shipping perishable goods such as oysters. In the Terrebonne region, the oyster industry grew significantly with the expansion of new rail lines into the area. Soon, many small vessels, particularly sailing and, later, motorized luggers, took up oystering and fishing in the waters of Terrebonne and Timbalier bays. The railroad plus other technological advances in processing oysters made Houma one of the most important oyster shipping centers in the country in the early 1900s.

The great importance of watercraft in the region inevitably meant that boat building would become important. There were some commercial builders in the area but many built boats primarily for personal use, family or friends. One of the commercial builders along Bayou Terrebonne was John A. Boyne and his sons John Madison, Andrew and Bill. They had two boatways and, as did others, they built their boats out of cypress, which grew in abundance in the Terrebonne swamps (Wurzlow 1985:V:33).

A description of the old Boyne Boat Ways is given in the following reminiscence by Ovide Bazet:

> This is my conception of the old Boyne boat Works on lower Bayou Terrebonne at Madison's Canal in about the year 1910, at which time I was 10 years old. The boat tied to the wharf is the type they specialized in at that

> time. It was a wide semi-round bottomed boat with graceful curves... It resembled a large wide scoop with a box on top. There was barely enough space in the cabin for the gasoline engine. The boat was steered on the outside from the rear. There was a large, compartment in the front under the foredeck where the catch of shrimp, fish or oysters was stored in ice until it arrived in Houma. This compartment which was opened by a trap door on the deck was called the "hole". This boat was called a "lugger". In spite of the excellence of workmanship and its gracefulness in the water, the boat was built for hard work. It was designed to navigate the shallow lakes, bayous and bays of which the coast of Terrebonne Parish is noted. Using only hand tools, carpenters at that time took much pride in their work and regardless of the time involved to build a boat, excellence of workmanship took priority. Every boat could be called a work of art [Wurzlow 1985:V:35].

The Rhodes were another boat-building family in the area. Ernest Rhodes founded one of the first and largest boatways along Bayou Terrebonne at the turn of the century. It was located about a mile below Bush Canal. Ernest was the oldest of four brothers; the others were Frank, Gustave and George. They were the sons of Thomas Rhodes who was a sea captain. Ernest had seven sons and two of them, Elie and Lawrence, became boat builders. Elie worked for the Houma Boat Company, a branch of the Higgins Boat Company of New Orleans, during World War II building P-T boats, landing boats and Navy boats. Elie Rhodes built many boats after World War II himself, all out of cypress. He considered cypress to be the best boat wood noting that:

> Nothing beats cypress for boats. No other wood will take the water like cypress. Another thing, good cypress does not have as many knots in it as other woods. Wherever a limb grows out, you will find a knot in the wood. When cypress trees grow close together in the swamp, they grow up tall before the limbs come out (Wurzlow 1985:V:37).

By the 1950s when Elie could not find good cypress anymore, he went into the fishing industry catching fish, shrimp and oysters.

Some information on commercial traffic on the waterways of the lower Terrebonne region can be obtained from records published by the Corps of Engineers in the Annual Reports of the Chief of Engineers. However, these records are generally available only for the time period after about 1880. One of the area's waterways for which commercial traffic and navigation information are available is Bayou Petit (or Little) Caillou, one of the waterways leading into western Terrebonne Bay. Measuring about 28 miles long, Little Caillou is a relict channel of the Lafourche-Terrebonne delta system. The upper channel was reportedly filled and was no longer considered navigable by 1882. At that time, the water depth at the channel mouth was from two to 11 feet. During the late nineteenth century, several man-made canals, generally about four feet deep, connected Bayou Little Caillou with other waterways (ARCE 1882:1413-1414). No information is provided on commerce for the bayou until the 1930s, apparently suggestive of the minimal amount of commercial traffic traveling along the bayou. Data for the year 1935 are shown in Tables 1 and 2. As can be seen, the vessels used were "motor" vessels and barges and much of the commerce reflected the oystering and shipping activities of the area.

Table 1. Trips and Drafts of Vessels on Bayou Petit Caillou for 1935. (After ARCE 1936:631.)

	Up-bound				Down-bound			
Draft (feet)	Steamers	Motor Vessels	Barges	Total	Steamers	Motor Vessels	Barges	Total
6		14	1,203	1,217		14	1,193	1,207
5	200	714	123	1,037	200	714	113	1,027
4	52	353	352	757	52	364	342	758
3		1,429	242	1,671		1,429	232	1,661
2		166	264	430		133	313	446
Total	**252**	**2,676**	**2,184**	**5,112**	**252**	**2,654**	**2,193**	**5,099**
Total net registered tonnage	**3,012**	**19,577**	**219,785**	**242,374**	**3,012**	**19,253**	**223,840**	**246,105**

Section included: 36 miles. Controlling depth: 6 1/2 feet. Project depth: Navigation season: Entire year.

(after ARCE 1936:631).

Bayou Grand Caillou, which measures about 28 miles long and empties into Caillou Bay, had been used since the earliest years of European settlement by a variety of small vessels carrying merchandise and produce into and out of Houma and surrounding communities, plantations and farms. However, this waterway seems to have lost its importance in the latter years of the nineteenth century. In 1882, this channel was entirely filled at the upper end and was open with only 5 to 8 feet of water throughout most of its lower segment. Vessels traveling on Grand Caillou did not draw more than 7 feet of water (ARCE 1882:1411-1412). No commercial statistics were obtained for this water body for the period prior to 1936.

Bayou Terrebonne represents a major navigable segment of the Bayou Lafourche system. During the early nineteenth century, Houma served as the head of navigation on Bayou Terrebonne. By 1880, the channel above Houma was nothing more than a drainage ditch and was useless for navigation. Below Houma, the channel was a shallow tidal bayou but it could be traversed by shallow-draft vessels. Ultimately, Houma, because of its advantageous location at the head of navigation, became the major port town in the region. Numerous businesses and facilities for handling boat-borne merchandise developed in the

Table 2. Commerce on Bayou Petit Caillou for 1935 (after ARCE 1936:627).

Domestic

In-Bound	Tons	Out-Bound	Tons
Animals and animal products:		Animals and animal products:	
Oysters, unshucked	355	Oysters, canned	80
Shells	2,950	Shrimp, canned	200
Shrimp, dried	26	Shrimp, dried	50
Shrimp, fresh	295	Shrimp, bran	100
Shrimp, bran	70	Wood and paper:	
Nonmetallic minerals:		Cordwood	25
Gasoline	225	Logs, barged	457
Oil, fuel, and gas	1,200	Nonmetallic minerals: Gasoline	50
Oil, lubricating	15	Unclassified: Ice	1,100
Total	**5,136**	**Total**	**2,062**
Value, $54,0095		Value, $80,377	
		Total, all traffic	**7,198**
		Value, $134,472	

(after ARCE 1936:627)

town. As noted earlier, sugar and lumber were major commodities handled at Houma but many other goods also passed through the town's docks. Castille and Holmes (1983:26) note the importance of the oyster packing industry in the town by the 1920s and report that commodities such as animal furs, cattle and alligator hides and frog legs were packed in barrels with layers of salt and shipped out, primarily to New Orleans. In 1880, two steamers traveled the lower end of Bayou Terrebonne "bringing freights from plantations on Terrebonne and other connecting bayous to Houma for shipment by rail" (ARCE 1880: 1179-1180).

The greatest part of the freight up the Terrebonne was sugar and molasses from the many sugar plantations in the region. Navigation of the upper end of Terrebonne near Houma was done at high tide, which, depending on the winds in the bays, often gave an additional 2 feet of water. Prior to 1880, commerce on the upper Terrebonne was handled "by flatboats which were cordelled and poled from plantations up to Houma" (ARCE 1880:1179-1180). There was a connection by rail at Houma with Morgan's Louisiana and Texas Railroad where freight was then shipped to market. Schooners and sloops also carried a considerable amount of freight through the bays and connecting bayous to New Orleans (ARCE 1880:1179-1180). Sometimes these vessels would sail out into the Gulf of Mexico using one of the several available passes among which were Wine Island Pass and Cat Island Pass.

Information on the commercial statistics for Bayou Terrebonne for the year 1915 for registered vessels shows a total of seven steamers and 12 "gas boats" operating on the bayou

at that time. The steamers carried 1,500 passengers that year. Unregistered vessels, consisting of 375 gas boats and 150 unrigged barges, generally, were those less than 20 tons in burden. Many of these unregistered gas boats were involved in the oystering and fishing industries. The freight carried on the bayou during the year consisted of a variety of articles. The commodity that had the greatest value was sugar, valued at $1,132,000 (ARCE 1916). A large quantity of logs was shipped that year, 15,604,300 feet or an equivalent of 62,417 short tons, reflecting the importance of the timbering industry in the early years of this century. Other commodities shipped in large amounts on Bayou Terrebonne were ground and grain feed, fertilizer, molasses, fuel oil, oysters, potatoes and miscellaneous merchandise. Smaller quantities of brick, cement, coal, cooperage, lime, lumber, machinery, naval stores, pilings and cypress ties were shipped as well as agricultural products such as corn, eggs, furs, fish, hides, moss, oats, rice, salt, and shrimp (ARCE 1916:2449-2450). Between 1888 and 1935, freight tonnage on Bayou Terrebonne increased from 5,416 to 115,666 tons (Table 3). During roughly the same period, motor vessel traffic increased from 15 to 1184 trips and barges made from nine to 465 trips (Table 4).

These published commercial statistics provide information on the types of commercial vessels and cargoes traveling along the area's waterways, but they do not convey information on the innumerable small craft that were in use. Large numbers of small watercraft, many if not most locally made, were used in the area from the very earliest periods until today. These included such local vessels as pirogues, bateaus, flats, sailing luggers and the like.

Navigation Improvements

The importance of water transportation led to early attempts to improve navigation in the region. By 1823, Terrebonne landowners were required by law to keep clear a 10-foot-wide channel along bayous bordering their lands (Watkins 1937:114). In upper Lafourche Parish, a man-made connection had been cut from Bayou Lafourche to Bayou Terrebonne in 1825. This canal greatly improved regional shipments of goods; although, it was limited to shallow-draft vessels. This canal was later filled, but in its day it contributed to the movement of produce such as, molasses, moss and sugar through the wharves at Thibodaux (Rogers 1976). Between 1840 and 1945, numerous water courses intended primarily for transportation were built and improved. In the Lafourche area was the Barataria Canal, which later became the Company Canal. This canal provided a convenient route from Morgan City to New Orleans through a system of natural and man-made water courses. Settlements along the middle reaches of Bayou Lafourche had an easy and safe route into the markets to the east and west. The canal provided a continuous east-west navigable waterway from Bayou Terrebonne to New Orleans. By 1908, traffic along the route had declined. Small fish and vegetable luggers were the principal users. Lumber, sugar, moss and molasses were also part of the canal’s commerce (Davis 1973).

Dredging was considered a standard means to improve navigation in the bayous and streams in the area but other measures were also explored. An interesting observation noted in Bayou Teche was that steamer traffic had a direct effect on the movement of sediments in the channel, especially on the smaller or narrow streams. It was observed that:

Side-wheel steamboats, such as are below New Iberia, and not above, are so constructed that there is a strong current from their wheels washing the bottom from some distance away from the mid-channel out to the banks, but no current at all in the middle, consequently the heavier portion of the material washed up is deposited in mid-channel behind the boat, and the swell of the

Table 3. Commerce on Bayou Terrebonne for 1935 (after ARCE 1936:630-631).

Domestic

In-Bound	Tons	Out-Bound	Tons
Animals and amimal products:		Animals and animal products:	
Fish	1	Dairy products	15
Lard	125	Lard	5
Milk, canned	188	Meat	33
Oysters, unshucked	2,553	Vegetable food products:	
Seafoods, canned	300	Flour and meal	10
Shells	2,600	Fruits and vegetables, canned	56
Shrimp, dried	117	Fruits and vegetables, fresh	50
Shrimp, fresh	2,397	Rice, cleaned	7
Shrimp, bran	147	Sirup and molasses	4
Vegetable food products:		Sugar, raw	8,352
Beans and peas, dried	1,100	Sugar, refined	16
Beverages	115	Sugarcane	5,322
Coffee	200	All other	25
Flour and meal	32	Textiles: Rope	4
Fruits and vegetables, canned	43	Wood and paper:	
Hay and feed	126	Cordwood	30
Oats	25	Lumber	2,000
Potatoes	75	Piling and poles	300
Rice, cleaned	125	Nonmetallic minerals:	
Sugar refined	120	Baroid	1,600
Sugarcane	15,677	Bunker oil	720
Textiles	17	Cement	800
Wood and paper:		Coal, anthracite	100
Logs, barged	457	Drilling mud	20,000
Paper and manufactures	19	Gasoline	459
Nonmetallic minerals:		Grease, lubricating	10
Bunker oil	7,060	Oil, crude	5
Oil, fuel and gas	2,056	Oil, fuel and gas	1,230
Oil, lubricating	160	Oil, lubricating	159
Sand and gravel	6	Salt	15

(continued)

Table 3. Concluded.

Domestic

In-Bound

	Tons
Ores, Metals and manufactures of:	
Iron and steel, manufactured	120
Iron and steel, rolled	800
Machinery and vehicles: Machinery and parts	1,201
Chemicals:	
Ammunition	32
Soap	150
Unclassified:	
Matches	22
Roofing	185
All other	393
Total	**38,744**

Value, $1,244,216

Out-Bound

	Tons
Ores, metals and manufactures of:	
Iron and steel, manufactured	450
Iron and steel, rolled	3,200
Machinery and vehicles: Machinery and parts	4,250
Chemicals:	
Explosives	20
Soap	3
Unclassified:	
Ice	2,671
Water, boiler	25,000
All other	1
Total	**76,922**

Value, $407,748

Up-Bound

Vegetable food products:	
Sugar, raw	6,000
Sugarcane	3,944
Total	**9,944**

Down-Bound

Vegetable food products: Sugarcane	3,661
Value, $16,474	
Total, all traffic	**129,271**
Value, $4,004,271	

(after ARCE 1936:630-631)

> boat, which is greater than that from a stern-wheel boat, washes the banks, and causes the widening of the surface. The stern-wheel boat spends the force of its engines on the one wheel at its stern, and the current from it washes up the bottom in the center of the bayou only, and the tendency of the heaviest part of the material washed would be to the more quiet water of the sides. So it would have a tendency gradually to improve the navigation, while the side-wheel boat far more rapidly destroyed it [ARCE 1880:1169].

Bayou Terrebonne was once an outlet of the Mississippi River via Bayou Lafourche but due to a closure at Bayou Lafourche in the years prior to 1880 the upper bayou silted in and navigation above Houma became impossible. Below Houma, Bayou Terrebonne was

Table 4. Trips and Drafts of Vessels on Bayou Terrebonne for 1935 (after ARCE 1936:631).

	Up-bound				Down-bound			
Draft (feet)	Motor Vessels	Barges	All Other	Total	Motor Vessels	Barges	All Other	Total
6	3	157		160	3	157		160
5	172	138		310	172	138		310
4	224	121	3	348	224	121	3	348
3	656	48	1	695	656	38	1	695
2	129	11		140	129	11		140
Total	**1,184**	**465**	**4**	**1,653**	**1,184**	**465**	**4**	**1,653**
Total net registered tonnage	**5,706**	**33,077**	**265**	**39,048**	**5,706**	**33,077**	**265**	**39,048**

Section included: Terrebonne Bay to Terrebonne Bayou, 32.8 miles. Controlling depth: 5 feet. Project depth: 5 feet. Navigation season: Entire year.

(after ARCE 1936:627-628)

tidally influenced and became a very important navigable waterway for the large plantations and smaller farms downstream. In a Corps of Engineers survey report in 1880, Bayou Terrebonne was examined in some detail in preparation of dredging the following years. The report notes that the roads along the bayou were useless for moving freight. Thus, the movement of goods depended on the navigation of Bayou Terrebonne, which also connected with other bayous to get produce to market.

Dredging of the Bayou Terrebonne channel was initiated in 1881. Before completion of the first dredging, the bayou at Houma was reportedly 40 feet wide and 4 feet deep and at low water it was only 10 feet wide and 6 inches deep (ARCE 1889:1508). As a result, all navigation at the upper end of Bayou Terrebonne was done at high tide. Above the entrance of Bayou Cane, the channel was practically dry; although, the towboat *Harry* stationed at Houma sometimes ascended to the mouth of Bayou Cane during high water (ARCE 1887:1397). This towboat was about 18 feet wide and had a draft of only 18 inches (ARCE 1891:1844). Based on the dimensions provided in this Corps of Engineers report, it is believed that the *Harry* was the 81-foot sternwheel towboat constructed at Murraysville, West Virginia in 1879 (Way and Rutter 1990:92). The 1881 dredging project created a 6-foot-deep channel in Bayou Terrebonne below Houma. However, local drainage ditch discharges soon created shoals that again reduced water depths in the bayou. In 1885, only one or two small steamboats traveled the lower channel (ARCE 1885:1407). To alleviate this problem, dredging of a four-foot channel from the mouth to the railroad depot at Houma was begun in 1880 and completed in 1887 (ARCE 1888:1250). By 1886, channel improvements were sufficient to allow small steamboats to run all the way to Houma (ARCE 1886:1265).

In September 1909, a hurricane devastated the navigation routes below Houma, clogging all the channels, many with silt as well as trees and debris. Using a prior emergency

appropriation authority, the U.S. Army Corps of Engineers dredged 4,500 feet of the Bayou Terrebonne and 4,400 feet in Little Bayou Caillou. The Rivers and Harbors Act of June 25, 1910 created a new project to dredge Bayou Terrebonne, apparently ignoring the other waterways. The purpose of the new program was to dredge a six-foot channel down Bayou Terrebonne from Houma to deep water (ARCE 1912). During the later part of 1915, the dredge *Delatour*, dug a channel from the St. Louis Cypress Company bridge in Houma to Bush Canal, the end of channel improvement. The channel was dug to a depth of six feet and a bottom width of 50 feet (ARCE 1916:2449). The Gulf Intracoastal Waterway (GIWW) was constructed through Houma in 1923 and later extended to Bayou Lafourche in Lafourche Parish (Barton et al. 2003).

In 1930, business leaders convened a meeting to pressure the U.S. Army Corps of Engineers to provide a deep-water channel from Houma to the Gulf (U.S. Congress 1931:5). Major R. F. Fowler prepared a survey and plan for dredging a channel down Bayou La Carpe to Bayou Pelton and then to Bayou Grand Caillou as far as the community of Dulac. Congress approved a dredging project in the River and Harbor Act approved August 30, 1935. The project was for a five-foot channel from the intersection of Bayou La Carpe with the Intracoastal Waterway at Houma southward within the bayou utilizing Bayou La Carpe, Bayou Pelton, and Bayou Grand Caillou to Bayou Dulac. The length of this project was 16.3 miles. The Corps noted the presence of several private wharves along these water bodies and a number of stiff-leg derricks for handling sugar cane (ARCE 1936: 712-3).

In 1935, a group of Houma businessmen again got together to push for the ship channel south to the Gulf. They published a booklet entitled "Houma Ship Canal" by the Houma-Terrebonne Chamber of Commerce, Julius Dupont, President. John H. Bernhard, 816 Howard Avenue, New Orleans, prepared the project that was to be the basis of the public hearing. Two years later, the Houma Harbor and Terminal District issued a report by Frederic R. Harris of New York, in consultation with John H. Bernhard of New Orleans. This report also urged the construction of the canal (Frederic R. Harris, Inc. 1937). In February 1939, the Board of Commissioners of the Houma Harbor and Terminal District issued a flyer arguing the case for the Houma Ship Canal. The commissioners were Julius Dupont, President; F. P. Guidry, Vice President; Dr. M. V. Marmande, Treasurer; D. W. Pipes, Secretary and J. J. Munson. John H. Bernhard was the Consulting Engineer. The flyer explained that current oil development in the parish would expire in fifteen years and that the Parish must be ready for new business. "We now have rail connections to take care of a Trainload, the Intracoastal Canal to take care of Bargeloads, highways to take care of Truckloads, but unless we acquire the Houma Ship Canal to move Shiploads we can never hope for really industrial development" (Board of Commissioners of the Houma Harbor and Terminal District 1939).

Planning for the Houma Ship Canal was placed on hold during World War II. One of only two blimp naval stations on the Gulf Coast was established at Houma and operated from May 1943 to September of 1944. Blimp squadrons were used to scan the coastline for enemy vessels (Barton et al. 2003).

In 1954, pro-canal forces coalesced once again. On January 13, 1954, the Terrebonne Parish Police Jury appointed several prominent citizens to a Terrebonne Parish Deep Water Channel Committee: M. L. Funderburk, chairman; J. J. Munson, vice-chairman; Louis E.

Routier, secretary; Gibson J. Autin, Alvin J. Boudreaux, James J. Buquet, Capt. Ovide J. Cenac, T. B. Holcombe, Butley Mahler, Thaddeus Pellegrin and A. Dupre Vaeth. The U.S. Army Corps of Engineers was interested in the project but the parish felt a COE project would take too many years of study. The committee envisioned the rapid expansion of the oil industry south of Houma and knew the canal project could not wait. Local planning money in the amount of $37,960 was quickly raised and led to the passage of a $3,500,000 bond issue on December 20, 1955 (*The Waterways Journal* 1962:19). The parish also recruited and received the aid of the State Department of Public Works, which completed many of the surveys for the project.

The next step was to secure a permit to dredge through the marshes from the U.S. Army Corps of Engineers. This process took six months over the winter of 1957-1958, and went smoothly until the Corps brought up the question of increased salt water intrusion into the marshes. On January 6, 1958, Thaddeus M. Pellegrin, President of the Parish Police Jury, wrote to Colonel William Lewis, Chief Engineer of the New Orleans District. He pointed out that for decades the Parish had been trying to secure agreement from among the many parties as to which of the natural bayous to deepen—Terrebonne, Petit Caillou, Grand Caillou, or du Large. Based on the surveys, the Parish had proceeded to acquire ninety-five percent of the land rights for the Houma Navigation Canal. The President then objected strongly to the new Corps position regarding salt water intrusion. The objection was received and at the end of the month Colonel Lewis delivered the permit dated January 29, 1958 to the Parish. The permit was in accordance with the State Department of Public Works map entitled "Map of Proposed Houma Navigation Canal, Terrebonne Parish," dated December 1957 (Louisiana State Department of Public Works 1957).

The parish acquired a 600-foot right-of-way for the Canal and dug it initially to a 300-foot top width, a 150-foot bottom width and a 16-foot depth. While Houma is seven feet above mean sea level (amsl), the elevation drops to only two feet just one-half mile to the south. For the next twenty-four miles, the average elevation is two and one-half feet amsl. The final twelve miles of the route were chiefly in open water—eight miles in Terrebonne Bay and four miles in the Gulf of Mexico. The first half-mile of the canal from its intersection with the Intracoastal Canal was dug through farmland. From there the Canal cut through swampland dotted with moss-draped trees. The prime contractor, the Walter P. Villere Company of New Orleans, divided the task into four parts and took on half of it with Villere men and equipment. Villere sublet the southernmost ten miles to F. J. J. Sloat Dredging Company, of Slidell, Louisiana. The Sloat firm then sublet a portion of its ten miles to Jahncke Service, Inc. of New Orleans. Villere also sublet the seven miles north of the upper end of the Sloat portion to the Monroe J. Wolfe Company, New Orleans.

The Houma Navigation Canal opened in June 1962. The River and Harbor Act of 23 October 1962 (U.S. Congress 1962) authorized Federal maintenance of the canal. When the Corps of Engineers initiated maintenance in November of 1964 the project dimensions were for a canal 15 feet deep and 150 feet wide from Houma to Cat Island Pass. The total length of the canal was 40.5 miles, with 10 miles in Terrebonne Bay and 3.9 miles in the Gulf of Mexico. In 1973, Congress authorized the deepening of the channel through Cat Island Pass and out to the 18-foot contour line to 18 feet with a width of 300 feet (U.S. Army Engineer District 1975:5). With the opening of the HNC, the intersection of the HNC and the

Intracoastal Waterway rapidly became a mecca for the oil field industry and remains so today. Residents of the region blame serious flooding in recent years on the Houma Navigation Canal and the lack of levees on Bayou Grand Caillou. Levees have been built along bayous du Large and Petit Caillou. At one time flood gates were planned at Bayou Plat, south of Wax Bayou, but these were never built. Some residents fear more dredging of the HNC until a lock system is in place to protect them from storm surges (Magnus Voisin, personal communication 2003).

Shipwreck Potential of the HNC Deepening Project Area

The shipwreck potential of any given area is related to an array of cultural and natural phenomena. However, two factors are considered particularly critical. These are the history of vessel use and loss in an area and the impacts that natural and man-induced forces have had on wrecks since their loss. The history of vessel use is tied closely to settlement and economic history. The longer and more intense the settlement of a given area, then the longer the period of boat use and, assuming boats are an important aspect of the economic system, then the more vessels will be involved in that system. In addition, where waterborne transport is important, patterns of vessel use tend to correlate with settlement patterns. Ultimately, the larger the number of vessels using or visiting a given locale, the greater the chances for lost and abandoned vessels.

The previous discussions provide information on the various types of vessels that used the waters in the vicinity of the five areas subjected to remote-sensing survey. As discussed, the shallow waters of southern Terrebonne Bay, to the north of Isle Derniere and Timbalier Island, historically limited the types of craft traveling those areas to shallow-draft vessels. However, deeper vessels did use Wine Island Pass and Cat Island Pass to enter into Terrebonne Bay and to access various waterways leading inland. At one time, Caillou Pass, located behind the western end of Timbalier Island, served as a navigation route between Timbalier Bay and Cat Island Pass. Caillou Island, once a substantial land mass marking the northern boundary of the pass, has entirely disappeared in the past 25 years (Google Earth 2008; U.S. Army Corps of Engineers 2007). Caillou Pass seems to have always been a shallow water area, limiting its use to shallow draft vessels. This pass is of interest because it falls within the boundaries of the Timbalier Island Survey Area. Thus, it seems most likely that any historic vessel lost within the two Terrebonne Bay survey areas will be one of these small, shallow draft vessels, such as a sailing or motorized lugger, shrimp boat or skiff. Luggers, particularly, were very numerous in these waters when oystering was a popular activity. These smaller watercraft as well as larger vessels would have used Cat Island Pass and, as noted, it is known that at least two schooners were lost near Cat Island Pass.

Any vessel lost in or along the offshore section of Cat Island Pass, where the two offshore survey areas are located, probably has a low to moderate preservation potential. Heavy seas and strong currents are common here and these are likely to have broken up and scattered any vessel lost here. However, vessels lost in the two survey areas behind the barrier islands would be largely protected from the damaging effects of high seas and strong currents. Under certain conditions, relatively large waves can be produced in Terrebonne Bay and, given the shallow water in the two survey areas, vessels lost there might have been broken up scattered to some degree. However, even if dispersion of wreck materials occurred, experience from other shipwrecks in similar settings demonstrates that larger and

heavier items (e.g., ballast, hull pieces, iron fittings, machinery etc.) might be only minimally displaced horizontally even though the vertical stratigraphy of the shipwreck may be compressed. Additionally, recent deposition of sediments onto the bay floor derived from eroded marshlands could have completely or entirely buried wreck remains. If so, these sediments would help create a low-oxygen environment at the wreck site, aiding in the preservation of organic materials. Overall, the potential for the preservation of wrecks in the Isles Derniere and Timbalier Island survey areas is considered moderate.

Evidence from navigable bayous in south Louisiana, even very small ones, shows that old and derelict vessels are commonly abandoned along their banks. Typically, abandoned vessels are concentrated in areas where docks and other bankside facilities were, or are, located. Thus, it is anticipated that sunken and possibly buried watercraft or pieces of watercraft are likely to occur in the Bayou Grand Caillou, specifically along the western bankline just below the entrance of Mound Bayou where historic settlement is known to have occurred. These bankline settings generally offer good preservation potentials to sunken vessels. This is because boats lost in these areas tend to have a high probability of becoming partially or totally buried by fine-grained sediments. These types of sediments limit the presence of oxygen-using organisms resulting in optimum conditions for the preservation of organic materials such as the wood used in historic boats. Thus, the preservation potential for sunken historic vessels in Bayou Grand Caillou, at least those that rest near the bank of the bayou, is considered to be high.

A variety of sources was reviewed for reported shipwrecks near the HNC Deepening Project area. These sources include the site files of the Louisiana Division of Archaeology, a 1938 WPA report on vessel accidents and casualties in the Louisiana area (WPA 1938), the compilation of known and historical shipwrecks in Louisiana developed by the Louisiana Division of Archaeology, as well as pertinent cultural resources studies carried out in the region. Also examined were a series of electronic databases derived from several Federal and state agencies that include reported wrecks, wrecks shown on maps, submerged obstructions and unidentified objects. CEI maintains these databases in a GIS format.

The Louisiana Division of Archaeology Shipwreck Database lists 104 shipwrecks in Terrebonne Parish. Over half of these (N=72) are located in Bayou Grand Caillou and represent submerged and partially submerged vessels recorded along the bayou by archaeologist from the New Orleans District in 1983 (Flayharty and Muller 1983). Included within this number are the tug boat *Kenny H*. and the fishing vessels (probably shrimp boats) *Mary Lee* and *Sonny Boy*, all of which are over 50 years old and, thus, meet the age criterion for National Register eligibility. However, these vessels have not been fully evaluated as to their National Register eligibility and, thus, they must be considered as potentially significant historic resources. Most of the other vessels recorded in the Flayharty and Muller study were partially or totally submerged and in decrepit condition such that they could not be specifically identified as to age or type, but the study presumed that many of them also represent boats that are over 50 years old and, thus, can be considered historic resources.

All of these watercraft were located along Bayou Grand Caillou north of the HNC and none fall within any of the areas to be impacted by the HNC Deepening Project. However, the findings of this study demonstrate that large numbers of sunken vessels displaying some amount of physical integrity can exist along waterways that are heavily

settled and that served as routes of travel for long periods, in this case almost 200 years. In fact, a reconnaissance survey of nearby Bayou du Large identified the same phenomenon. There, 37 derelict boats were recorded along an approximately seven-mile-long segment of the bayou (Stout 1992). These boats consist of those that were visible at the time of the survey and does not account for any that might be entirely submerged or buried. As Stout (1992) and others (see Pearson and Saltus 1991) have noted, the types of small watercraft existing as abandoned or derelict vessels along the waterways of south Louisiana often represent locally built "folk craft" that no longer exist or are disappearing from use. Thus, they can represent significant historical resources as exemplars of local boat building traditions and boat use. Based on these two studies and on other similar surveys conducted in south Louisiana, it is anticipated that almost every waterway displaying a long and intensive period of use by watercraft and a long history of settlement will exhibit a similar record of abandoned and lost watercraft. As noted previously, historic settlement did extend into the lower portion of Bayou Grand Caillou including the area where dredging is planned as part of the HNC Deepening Project. Even though no historic shipwrecks are reported along this segment of Bayou Grand Caillou, the evidence from other similar waterways strongly suggests that submerged historic watercraft remains are likely to exist there. These vessels are considered most likely to represent small vernacular watercraft that have been purposefully abandoned at or near areas where historic settlement has existed along the bayou.

Figure 8 provides information on the reported locations of a variety of objects in the lower Terrebonne Bay area in the vicinity of the four locations examined by remote-sensing survey. The various objects shown in this figure are derived from electronic databases maintained by CEI. Information on the identity of these objects and the sources of information are provided in Table 5. As can be seen most of the objects represent "Unidentified hangs" reported to the state as claims by fishermen for damaged nets. In the 1990s, the state of Louisiana initiated the "Underwater Obstruction Removal Program" to locate and remove as many of these hangs as possible. As seen in Table 5, most of the reported hangs in the vicinity of the survey areas could not be found when a search was made. It is unknown if the positions of these objects were incorrectly reported or if they had been removed prior to the start of the program. As of 2003, the program had located and removed or scheduled to remove other types of objects in the area such as pilings, pipe, barges, etc. Two pieces of dredge pipe located immediately adjacent to one of the offshore survey areas were located and removed as part of this program (see Table 5).

In addition to the various sources noted above, several historic and modern charts and maps of the area were examined for the presence of shipwrecks in the vicinity of the survey areas. The only maps showing wrecks in this area are the various editions of the nautical charts for the area. The most recent of these charts, the 2008 online edition of Chart No. 11357, *Timbalier and Terrebonne Bays* (NOAA 2008) shows several wrecks in western Terrebonne Bay. The identity of these wrecks is unknown but none falls within the project APE.

Only three shipwrecks that can be considered historic and fall near the survey areas are listed in Table 5. These are the schooners *Thistle* and *Lizzie Haas* and a vessel named

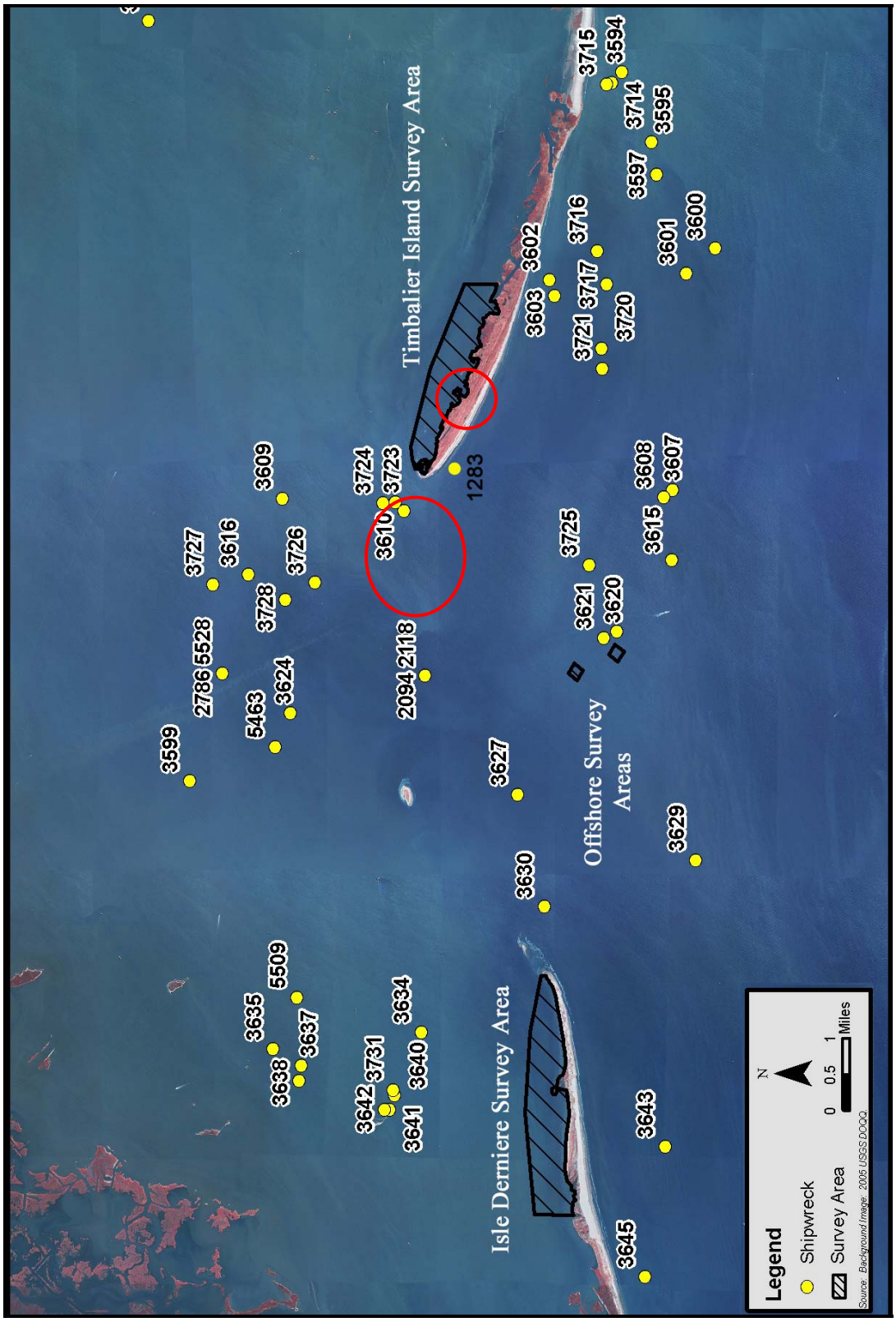

Figure 8. **Reported wrecks, obstructions and other submerged features in the vicinity of the remote-sensing survey areas in Terrebonne Bay and Cat Island Pass. See Table 3-5 for information on these objects. Approximate locations of historic shipwrecks are circled in red.**

Table 5. Submerged Objects and Reported Shipwrecks in the Vicinity of the Project APE Near Cat Island Pass.

CEI Number	Identification	Comments	Sources of Information
1283	Schooner *Thistle*	Foundered, Timbalier Island, October 25, 1877	CEI 1989
2094	Schooner *Lizzie Haas*	Foundered, Wine Island, December 11, 1902	MMS 2004
2118	Vessel *Loufayterry*	Lost in 1955	MMS 2004
2786	Unknown obstruction		NOCOE 2001
3594	Unidentified hang	Not found	UORP 2003
3595	Unidentified hang	Not found	UORP 2003
3597	Unidentified hang		UORP 2003
3599	Unidentified hang	Not found	UORP 2003
3600	Unidentified hang	Not found	UORP 2003
3601	Unidentified hang	Not found	UORP 2003
3602	Unidentified hang	Not found	UORP 2003
3603	Unidentified hang	Not found	UORP 2003
3607	Unidentified hang	Not found	UORP 2003
3608	Unidentified hang	Not found	UORP 2003
3609	Unidentified hang	Not found	UORP 2003
3610	Unidentified hang		UORP 2003
3615	Unidentified hang	Not found	UORP 2003
3616	Unidentified hang		UORP 2003
3620	Dredge pipe	Removed	UORP 2003
3621	Dredge pipe	Removed	UORP 2003
3624	Unidentified hang	Not found	UORP 2003
3627	Unidentified hang		UORP 2003
3629	Barge	Not found	UORP 2003
3630	Unidentified hang		UORP 2003
3634	Large area of debris	To be removed	UORP 2003
3635	2 logs		UORP 2003
3637	Unidentified hang		UORP 2003
3638	40 foot pipe	Removed	UORP 2003
3640	2 flow lines	To be removed	UORP 2003
3641	Flow lines	Removed	UORP 2003
3642	3 pilings		UORP 2003
3643	Unidentified hang		UORP 2003
3645	Unidentified hang		UORP 2003
3714	Unidentified hang		UORP 2003
3715	Unidentified hang	Not found	UORP 2003
3716	Unidentified hang	Not found	UORP 2003
3717	Unidentified hang	Not found	UORP 2003
3720	Unidentified hang	Not found	UORP 2003
3721	60 foot barge	To be removed	UORP 2003
3723	Unidentified hang		UORP 2003
3724	Tank	To be removed	UORP 2003
3725	Unidentified hang	Not found	UORP 2003

(continued)

Table 5. Concluded.

CEI Number	Identification	Comments	Sources of Information
3726	106 feet of pipe	To be removed	UORP 2003
3727	Dredge pontoon	To be removed	UORP 2003
3728	Unidentified hang	Not found	UORP 2003
3731	Pipe	To be removed	UORP 2003
5463	16 foot pleasure craft	Not found	US Coast Guard
5509	Fishing vessel *Little Robbie*	Salvaged	US Coast Guard
5528	Unidentified submerged object	Not found	US Coast Guard

Sources:

CEI 1989 = Inventory of reported shipwrecks in the New Orleans District, in Pearson et al. 1989
MMS 2004 = Wrecks reported in Pearson et al. 2004.
NOCOE 2001 = Database maintained by the Office of Dredge Function, USCOE, New Orleans.
UORP 2003 = Database maintained by the Louisiana Department of Natural Resources, Underwater Obstruction Removal Program, as of 2003.
US Coast Guard = Database of obstructions to navigation and accidents, maintained by the United States Coast Guard, Eighth District, as of 2006.

Loufayterry. The locations shown for these vessels in Figure 5 are only approximate positions of loss. The historical information on where these vessels sank is vague, so the positions shown here must be considered unreliable. Little is known about the *Loufayterry* other than it sank in 1955. The schooners *Thistle* and *Lizzie Haas*, however, are better known and are among the three historic vessels lost in the vicinity of Cat Island Pass discussed by Birchett and Pearson (1998). The third vessel discussed by Birchett and Pearson was the 151-ft sidewheel steamer *Merchant* that stranded somewhere on Timbalier Island on October 3 or 4, 1842 with a loss of eight lives. It is unknown if the *Merchant* was successfully removed and refloated or if she broke up after stranding (Birchett and Pearson 1998:23).

The other two vessels, the *Thistle* and the *Lizzie Haas* do seem to have sunk somewhere near Cat Island Pass. These vessels are of some interest because they were rather typical of the commercial vessels using Cat Island Pass, Terrebonne Bay and the bayous leading into the interior during the nineteenth century. The *Thistle* was a two-masted schooner built at Mobile, Alabama, in 1864. Her burden was 52.33 tons and she measured 73.1 ft long, 21.2 ft wide (breadth) and 5.7 ft deep. The *Thistle* was typical of the shallow draft schooners and sloops that traded along the Gulf Coast during much of the nineteenth century. The *Thistle* originally sailed out of Mobile, then out of Galveston, Texas, until she was purchased by Edward Ranlett of New Orleans in May 1877. On October 25, 1877, the *Thistle* was driven ashore on the west end of Timbalier Island in high winds and heavy seas. The schooner was listed as a total loss and valued at $25,000 (Birchett and Pearson 1998:23).

The *Lizzie Haas* was a small two-masted schooner built at Madisonville, Louisiana, in 1882. She had a burden of 26.62 tons and measured 59.2 ft long, 21.5 ft wide and 4.3 ft deep. The *Lizzie Haas* sailed out of New Orleans under several owners until 1899. That year she was enrolled in Madisonville by John Milloit, her new owner and captain. On December 11, 1902, on a voyage from Bayou Grand Caillou to New Orleans, the *Lizzie Haas*

foundered on Wine Island in a heavy gale. The schooner was declared a total loss and valued at $2,500 (Birchett and Pearson 1998:24).

CHAPTER 4

PREVIOUS INVESTIGATIONS

This section will provide data on previous investigations pertinent to the archaeology of the region. As much of this information has been presented previously (Brown et al. 1997, 2000; Gibson 1979; Goodwin et al. 1985a; Neuman 1977, 1984; Ryan et al. 2005; Weinstein 1994; Weinstein et al. 1978; Weinstein and Kelley 1992), only a summary is provided here.

The earliest recorded archaeological investigations in the vicinity of the present project area were those of Henry B. Collins of the U.S. National Museum in 1926. Collins spent almost three months examining sites across coastal Louisiana. A brief summary of his survey appeared the following year (Collins 1927). The section pertinent to the present project is presented below:

> From Pointe a la Hache, Mr. Collins proceeded to Houma, in Terrebonne Parish, and examined a number of mounds and shell middens. There he was fortunate in having the co-operation of Mr. Randolph A. Bazet, who is deeply interested in the local archeology and who was able to supply valuable information on many earth mounds and shell deposits of Terrebonne Parish. Such remains were found in unexpected numbers along the lakes and bayous, ranging from comparatively small accumulations of shells mixed with charcoal, potsherds, bones, and other refuse to huge deposits of the same material, or "islands" as they are locally called, sometimes a hundred yards or more wide, about 10 feet above the marsh level, and extending in some cases for a distance of almost a quarter of a mile. These Terrebonne Parish shell heaps, or kitchen middens, and the others throughout southern Louisiana, are composed almost entirely of the shells of a small brackish water clam, *Rangia cuneata*, which is very common in the bayous and lakes of the Gulf region. They represent merely the accumulated kitchen refuse of the Indians who once lived along these water ways. The clams were eaten, and the shells, along with other trash, were cast aside until in the course of time an extensive heap was formed.
>
> After devoting some 10 days to the mounds and shell heaps of Terrebonne Parish, investigation was made of those to the west and north at Gibson, Lake Palourde, Bayou l'Ours, Berwick, Charenton and Avery Island. Having examined and carried on minor excavations at these localities, Mr. Collins continued westward to Pecan Island in the southern part of Vermillion [*sic*] Parish where he remained for three weeks [Collins 1927:200-202].

Following Collins' brief survey and discussion, almost 30 years elapsed before any other work pertinent to the present project area was published. In the early 1950s, William

G. McIntire (1958) conducted an extensive survey of Indian sites and their relation to Mississippi River deltaic distributary channels. Drawing on research on ceramic chronologies in other portions of the Lower Mississippi valley, he used the pottery recovered from sites in the delta to assign ages to the sites and, by extension, the landforms on which they were located. In this way, he attempted to reconstruct the paleogeography of the region. McIntire identified seven sites within one mile of the present project area, three of which fall within the present project's Area of Potential Effects (APE) (Table 6).

After McIntire's work in the early 1950s, there is another gap in research until the early 1970s when surveys conducted in relation to Federal historic preservation laws began. One of the earliest of these near the present project area was Robert Neuman's (1974) bankline survey of the Houma Navigation Canal and Bayous La Carpe, Terrebonne, Petit Caillou, and Grand Caillou. He recorded sites 16TR6, 16TR37, and 16TR38 along Bayou Grand Caillou. Although Neuman's survey included the bankline of the HNC, it would not be considered systematic or intensive by today's standards.

The 1975 survey by CEI (Gagliano et al. 1975) of the GIWW was the first large-scale, survey in the vicinity of the project area since McIntire's research in the 1950s. Although actual survey coverage was limited to the banks of the waterway, sites within one mile of the GIWW were also reviewed. Perhaps the most useful contribution of the study was the presentation of a revised sequence of delta lobe formation and associated archeological sites (Gagliano et al. 1975:46-57).

In 1976, Neuman (1976) conducted a survey of a proposed barge port facility located near Houma. This survey was located adjacent to Disposal Area 1 of the present project and may have included a portion of that area.

In 1978, New World Research, Inc. conducted a study of archaeological sites that would potentially be impacted by a proposed regional sewer system in Terrebonne and Lafourche parishes (Altschul 1978). They attempted to relocate and evaluate 31 previously recorded sites in this area, nine of which fall within one mile of the HNC Deepening project area (see Table 4-1). Three of these sites, 16TR6, 16TR37, and 16TR38, were recommended as being eligible for the National Register of Historic Places (Altschul 1978:Table 30). Three other sites, 16TR72a (now 16TR72), 16TR72b (now 16TR115), and 16TR74, were considered potentially eligible (Altschul 1978:Table 29). One site, 16TR71, was recommended as not eligible for the National Register of Historic Places; another, 16TR51, could not be examined because the landowner denied access; and a third, 16TR2, could not be relocated (Altschul 1978:Table 28).

In 1983, two cultural resources surveys (Castille 1983; Castille and Holmes 1983) were undertaken in the city of Houma to assess historic sites and standing structures along Bayou Terrebonne for a proposed bridge corridor. These studies identified 283 historic structures, several dating to the middle and late 19th century. Many of the structures are associated with the oyster and shrimp canning/packing industry of Houma.

Table 6. Previously Recorded Sites Within One Mile of the Houma Navigation Canal Deepening Project Area.

Site No.	Site Name	Site Type	Age of Occupation	Eligibility	Reference
16TR2	Sanders	shell midden	Mississippian	unknown	McIntire and Baumann 1987
16TR6	Dulac	shell midden	Coles Creek, Plaquemine	eligible	Neuman 1974, Altschul 1978
16TR11		shell midden	Plaquemine	unknown	McIntire 1958
16TR12		**shell midden**	**Coles Creek, Plaquemine**	**unknown**	**McIntire 1958**
16TR13		shell midden	NeoIndian	unknown	McIntire 1958
16TR14		**shell midden**	**Coles Creek, Plaquemine**	**unknown**	**McIntire 1958**
16TR15		shell midden	prehistoric unknown	unknown	McIntire 1958
16TR18		**shell midden**	**prehistoric unknown**	**unknown**	**McIntire 1958**
16TR22	Mound Bayou	2 mounds and shell midden	Coles Creek, Plaquemine	unknown	Saunders 1994a
16TR37	Ellesly Plantation	2 mounds	Troyville, Coles Creek, Plaquemine	eligible?	Neuman 1974; Altschul 1978; Saunders 1994a
16TR38	Grand Caillou	3 mounds	Coles Creek, Plaquemine	eligible	Neuman 1974; Altschul 1978
16TR51	Johnson School	shell midden	NeoIndian	unknown	Altschul 1978
16TR59	Parasolle	shell midden	prehistoric unknown	unknown	
16TR71	Old Bridge	shell midden	Plaquemine	not eligible	Altschul 1978
16TR72	Four Point Bayou	shell midden	Plaquemine	unknown	Altschul 1978
16TR74	Bayou Petit Caillou	shell midden	Plaquemine	unknown	Altschul 1978
16TR89	East Prevost	shell midden	Marksville, Baytown	unknown	
16TR115	Deep Bayou Channel	prehistoric scatter	Plaquemine	unknown	Altschul 1978
16TR151	BFYM	shell midden	Plaquemine	unknown	Flayharty 1983
16TR152	Grand Caillou	shipwreck	historic	not eligible	Flayharty 1983
16TR153	BGC No. 38	shipwreck	historic	unknown	Flayharty 1983
16TR156	Sonny Boy	shipwreck	20th c.	not eligible	Flayharty 1983
16TR157	Dolly K	shipwreck	historic	not eligible	Flayharty 1983
16TR160	Hebert	shell midden	NeoIndian	unknown	
16TR189	Bayou Sale Mounds	3 mounds	Coles Creek, Plaquemine	eligible	Weinstein 1985
16TR198	Mulberry Cemetery	cemetery, historic scatter	Mid-late 19th c.	not eligible	Weinstein and Kelley 1992
16TR203	Mulberry Bricks	historic scatter	Mid-late 19th c.	unknown	Weinstein and Kelley 1992
16TR222	BDL Vessel No. 1	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR223	BDL Vessel No. 2	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR224	BDL Vessel No. 3	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR225	BDL Vessel No. 4	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR226	Miss Kirby	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR227	BDL Vessel No. 6	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR228	BDL Vessel No. 8	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR229	BDL Vessel No. 9	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR230	Captain Russell	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR231	BDL Vessel No. 11	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR232	BDL Vessel No. 13	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR233	BDL Vessel No. 14	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR241	BDL Vessel No. 22	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR242	BDL Vessel No. 23	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR243	BDL Vessel No. 24	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR244	BDL Vessel No. 25	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR245	BDL Vessel No. 26	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR246	BDL Vessel No. 27	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR247	BDL Vessel No. 28	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR248	BDL Vessel No. 29	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR249	BDL Vessel No. 30	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR250	BDL Vessel No. 31	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR251	BDL Vessel No. 32	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR252	BDL Vessel No. 33	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR253	BDL Vessel No. 34	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR254	BDL Vessel No. 35	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR255	BDL Vessel No. 36	shipwreck	late 19th-20th c.	not eligible	Stout 1992
16TR302		historic scatter	late 19th-20th c.	not eligible	Robblee et al. 2000
16TR303		historic scatter	mid 19th-20th c.	not eligible	Robblee et al. 2000
16TR306	Theriot	3 mounds	L. Coles Creek, Plaquemine	eligible	Le Boeuf and Weinstein 2001
16TR307	Walker Lovell	1 or 2 mounds	Coles Creek, Mississippi	unknown	
16TR308	Brunet	prehistoric scatter	Coles Creek, Plaquemine	unknown	

Note: Sites shown in **bold** are within the present project's Area of Potential Effects

Another bankline survey near the present project area was performed by R.A. Flayherty and J.W. Muller of the U.S. Army Corps of Engineers (COE), New Orleans District, in 1983. Bayou Grand Caillou between Bayou Provost and the Houma Navigation Canal was examined. Previously recorded sites 16TR6 and 16TR37 were visited, and one new shell midden site on Bayou Grand Caillou (16TR151) and 69 derelict vessels were newly recorded (see Table 4-1). A magnetometer was used in this survey, but no significant anomalies were recorded. Flayharty and Muller noted that local informants knew of submerged watercraft; and that the negative remote sensing results were probably because most, if not all, of these craft were primarily of wooden construction.

In 1984, Floyd and Stuckey reported on a remote-sensing survey conducted to determine the location of seafloor or subbottom hazards to construction of a 10-inch pipeline for Texas Gas Transmission Corporation. The instruments used in this survey were a magnetometer, side-scan sonar and a subbottom profiler. The pipeline route was in Blocks 2 and 9, south of Isles Dernieres and west of Cat Island Pass. Eleven magnetic anomalies were located, but all ranged from 15 to 24 gammas with very brief signature widths, suggesting that the anomalies "represented debris discarded during prior construction activities in this rather congested production field" (Floyd and Stuckey 1984). Also in 1984, William McIntire and Robert Baumann examined a proposed weir site near Marmande Ridge and Minors Canal. They located 16TR69, a shell midden partially destroyed by the digging of Minors Canal. Test excavations showed that possible intact deposits remained at the site but would probably be eroded away within a few years due to boat traffic and use of the site as a fishing camp. Weir construction was, therefore, allowed to proceed.

In 1986, R. Christopher Goodwin & Associates, Inc. examined the route of the proposed Larose and Golden Meadow Hurricane Protection Levee. While no new sites were identified, a previously recorded site (16LF99) outside the right-of-way was tested to determine its size and cultural affiliation (Poplin et. al. 1986). Likewise, the pipeline survey Weinstein (1985b) conducted for the Texas Gas Transmission Company in Terrebonne Parish located no cultural resources. Yet an unrecorded mound group (16TR189) was noted on Bayou Sale, 2.4 km north of the pipeline route. McIntire and Baumann (1985) likewise found no new sites during their survey of a proposed water control structure near Lake Carrion Crow but did conduct test excavations at a known shell midden site, 16TR66. This site was in excellent condition and, thus, eligible for the NRHP. Fortunately, 16TR66 lay 205 m outside the project area and would not be impacted.

Weinstein (1987a) conducted a survey along Bayou Mauvais Bois in the Terrebonne Parish marshes west of the project area. This study involved investigations along two proposed pipelines and examined several prehistoric shell middens (16TR190-16TR192). All three sites were avoided during pipeline construction. William McIntire and Robert Baumann conducted three small surveys that same year, one for a proposed sewerage line and facilities south of Houma (1987a), another for a levee and flood gate near Chauvin (1987b), and a third for a levee and pump station on Bayou Grand Caillou near Dulac (1987c). Portions of Bayou Little Coteau, Ashland Canal, St. Louis Canal, and Bayou Petit Caillou were examined during the first survey, but no new or previously recorded sites could be located. No cultural resources were noted in the project area on the second survey, but nearby sites 16TR10 and 16TR86 were determined to be the same site. Likewise, the third survey produced no findings; although, nearby known site 16TR6 was discussed.

In 1989, Heartfield, Price, and Green, Inc. conducted a survey for Tenneco Gas of a proposed pipeline beginning near the juncture of Bush Canal and Bayou Terrebonne and extending east across 1.6 mi of freshwater marsh. While no new sites were located, 16TR10/86 was reexamined and the site limits refined. Also, in that year Pearson et al. (1989) produced a general study of the history of waterborne commerce and shipwreck potentials within the New Orleans District. Although the project area was not considered specifically and the navigation history of the immediate area only minimally discussed, this study did note the existence of several reported historic shipwrecks in the general vicinity of Cat Island Pass. Thomas Birchett and Charles Pearson (1998) conducted a remote sensing survey of the Cat Island Pass Channel portion of the Houma Navigation Canal in 1997. Four anomalies with characteristics similar to known shipwrecks were identified, but diving confirmed that none represented significant cultural resources.

Coastal Environments, Inc. conducted a large-scale investigation of the Terrebonne marsh as part of a New Orleans District COE effort to better protect Morgan City from floodwaters (Weinstein and Kelley 1992). Thirty-four new sites were located, 36 known sites revisited, and the collections from another 21 known sites reviewed. One thrust of this study was the documentation of changes in the deltaic environment and human settlement patterns through time. Site densities were also examined, and the future condition of the cultural resource base in the area predicted based on models of habitat change.

Rebecca Saunders of the Museum of Natural Science at Louisiana State University tested 16TR22 near the intersection of Mound Bayou and Bayou Grand Caillou in 1994. Her aims were to determine the site's National Register status and to look for complicated stamped ceramics similar to those found in Florida. Two of the three possible mounds at the site reported by McIntire in 1951 had apparently eroded away by this time, but test units were placed in the surviving mound. Radiocarbon dating confirmed a Coles Creek component at this site, in addition to Mississippi Period and historic components (Saunders 1994:90-93).

Late in 1995, the New Orleans District COE directed R. Christopher Goodwin & Associates, Inc. to conduct additional investigations on eight of 37 derelict watercraft previously identified on Bayou du Large in 1992 (see Table 4-1) (Stout 1992). That study had examined Bayou du Large from the Falgout Canal to Grand Pass. All eight vessels were reportedly too badly deteriorated or inaccessible below the waterline by 1995, so six others were examined instead (Robinson and Seidel 1995). This study involved photography, measured drawings, historical research and oral interviews.

The following year in 1996, R. Christopher Goodwin & Associates, Inc. surveyed the route of a proposed gas transmission line from the Gulf of Mexico to Lafourche Parish (Miller et al. 1996). Two new sites (16LF65 and 16LF66) with Plaquemine and nineteenth-to-twentieth-century components were discovered. The former was recommended for additional testing, while the latter was declared eligible for the National Register of Historic Places (NRHP) and mitigation recommended. A year later, this same company examined two proposed dredge disposal areas on Bayou du Large in Terrebonne Parish (Walter et al. 1998). No archaeological sites were encountered, but six standing structures were documented and declared ineligible for the NRHP.

Two mitigation reports on historic sites in Terrebonne Parish appeared in print in 1998 and 1999, both produced by CEI. The earlier volume describes field investigations conducted at the Donner Sawmill Residential Area (16TR116), near the present-day town of Donner, in 1989 (Hahn and Schwab 1998), and builds on previous work at the site by Castille et al. (1979) and Castille and Pearson (1980). Donner was a company town occupied from about 1900 to 1938 before being reclaimed by the swamp. The second report describes similar excavations conducted in 1982 at the Goodland Cypress Sawmill Company site (16TR114) in Chacahoula (Whelan and Pearson 1999). Artifact assemblages from the homes of sawmill administrators, white laborers of Cajun descent, and black sawmill workers were compared in an attempt to determine if race, culture, and economic status were reflected in their material culture.

Two recent reports prepared by R. Christopher Goodwin & Associates, Inc. for the Morganza to the Gulf Feasibility Study examine areas near the present project (Brown et al. 1997, 2000). The 1997 report is a "Literature Search and Records Review" type study, the main aim of which was to create a predictive model for site locations in a delta setting. The latter report details a sample survey conducted to test the predictive model, which states that sites will be found on natural levees. Results verified the model, while six new sites and two new standing structures were discovered. Five known sites and three previously recorded standing structures were also revisited. Three sites (16TR19, 16TR33, and 16TR304) and two standing structures (55-1013 and 55-1113) were recommended as eligible for the NRHP. The Louisiana Divisions of Archaeology and Historic Preservation disagreed with three of these recommendations and have determined site 16TR304 and structures 55-1013 and 55-1113 as not significant.

In 2003, CEI conducted a literature search and records review related to the HNC Deepening Project (Ryan et al. 2005). Three previously recorded archaeological sites and 13 sunken or salvaged vessels were identified within the project's Area of Potential Effects (APE). In addition, a brief reconnaissance survey of the HNC made during the course of the study identified seven unrecorded archaeological sites located along its banks. A research design for future investigations related to the project was also presented.

In summary, despite the number of archaeological surveys that have been conducted in the vicinity of the present project's APE area, very few of these have examined portions of this area. The exceptions are McIntire's (1958) survey, Neuman's surveys of the HNC (Neuman 1974) and the barge port facility (Neuman 1976), and CEI's brief reconnaissance survey of the HNC (Ryan et al. 2005). With the possible exception of Neuman's barge port facility survey, none of these were systematic or intensive, and it is therefore difficult to estimate how much area they covered. One indication of the limited number of systematic surveys in the present project's APE is that although there are 59 archaeological sites recorded within one mile of it only three of these actually fall within the APE.

CHAPTER 5

RESEARCH DESIGN

Research Topics

The previous chapters on the environment and the sequence of cultural development have raised a number of questions about human adaptation to the project area. These generally concern culture history, settlement systems, and historic watercraft and navigation. The sources used to form these questions include general models of the behavior of hunter-gatherers (Binford 1980; Jochim 1976) and agriculturalists (Rappaport 1968); previous archaeological research within the Lower Mississippi Valley (Phillips 1970; Weinstein et al. 1979a), particularly within the Mississippi Deltaic Plain (Kniffen 1936; McIntire 1958; Gibson 1978b; Gagliano et al. 1979; Wiseman et al. 1979; Gagliano 1984; Goodwin et al. 1985b); and the work of cultural geographers in southern Louisiana (Knipmeyer 1956; Rehder 1971; Comeaux 1972).

Culture History

Although the general sequence of cultural development in the region is known, there are a number of gaps in our current understanding of the aboriginal culture history. For instance, relatively few Archaic, Poverty Point and Tchula period occupations are known in the vicinity of the project area, although Teche deltaic deposits, which are old enough to contain them, are present in the western portion of the area. For the Marksville period, it remains uncertain why the Mandalay phase shows greater similarities to Marksville assemblages farther up Bayou Teche than to those east of the study area in the Barataria Basin and the St. Bernard marshes. Conversely, why the Coles Creek phases identified within the study area show greater similarities to Coles Creek assemblages located to the east in the Lafourche Delta than to those further upstream along Bayou Teche remains unclear.

While Mississippi period occupations are common within the study area, most reflect Plaquemine culture and contain relatively few shell-tempered ceramics. Whether these shell-tempered ceramics represent cultural interaction such as trade or the presence of Mississippian culture groups remains unclear. Historic period occupations related to the Houma tribe are certainly present within the project area; however, their age, distribution and character have not yet been defined.

Settlement Systems

Previous archaeological and geographical research in Terrebonne and adjacent coastal parishes suggests that certain aspects of human adaptation to the deltaic plain have remained consistent due to the environmental constraints the region presents. In particular, the spatial relationship of settlements to the landforms or depositional environments of the deltaic plain exhibits marked continuity through time.

Certain landforms, especially natural levees, appear to have been the predominant location of human habitation sites for all periods (Kniffen 1936; Knipmeyer 1956; McIntire 1958; Gagliano 1984; Gagliano et al. 1979). Several factors are responsible for this pattern. First, in many cases natural levee ridges were the only elevated and relatively well-drained terrain available. In this regard, they provided a base for dwellings and land for agricultural fields. Natural levees also represented an important habitat for terrestrial game as well as a source for raw materials. A third factor contributing to their extensive use by human groups was their proximity to open water. This was important not only for human subsistence but for transportation as well.

The state of the channel adjacent to the natural levee was apparently a key factor in the choice of where to live. If the channel was still part of the active delta then flooding may have been severe enough to prevent permanent or even semi-permanent occupation. However, if the channel had been abandoned, then long-term habitation may have been possible. The cycle of biological succession within the surrounding delta, which determined the productivity of the nearby swamp and marsh environments, was probably also of importance (Gagliano and van Beek 1975).

Relict beaches or barrier islands were also chosen for habitation (Shenkel 1974:41; Brown 1984:100). These features are much less common than natural levees, so that the number of sites actually associated with them is much smaller. In addition, they often did not provide the expanse of elevated, well-drained land available on natural levees.

Other depositional environments found within the deltaic plain, including active and abandoned channels, swamps, marshes, active beaches, lakes and interdistributary bogs, served primarily as resource extraction zones or transportation routes and were seldom the location of habitations until the advent of recent technologies for flood-proofing structures. Exploitation of these environments often took place from settlements located on nearby natural levees or relict beaches, but may also have involved the short-term use of resource extraction sites.

Several questions persist concerning site location in the deltaic plain. For example, while long-term habitation sites in the deltaic plain generally occur on relatively stable, elevated landforms (in this case natural levees and relict beach ridges), do short-term resource extraction sites occur in a variety of depositional environments? Also, are the majority of prehistoric habitation sites in the region associated with relict deltaic features rather than active ones and, if so, are resource extraction sites associated with both environments? Determining the function of sites as well as the landforms with which they are associated should help clarify some of these issues.

More data are also needed to determine how site function, size, and distribution varied over time. Determining the size of Archaic and Poverty Point period occupations within the study area and collecting floral or faunal remains which may provide seasonality information would clarify whether all the Archaic and Poverty Point period components within the study area were small and occupied seasonally. The size, depth of deposit, and artifact assemblages from later sites of the Tchula, Marksville, Baytown and Coles Creek periods would reflect the presence of semi-permanent or permanent villages, resource extraction sites, and also centralized burial and platform mounds. The type, size and distribution of these sites might also provide information on an emerging site hierarchy. Similar data would be needed from Mississippi period sites in order to identify agricultural hamlets and small political polities.

Information is also lacking on the size and number of historic aboriginal components within the study area and their associated artifact assemblages. Archaeological data could be supplemented by oral histories in the case of the Houma. Colonial, Antebellum, Postbellum, and Modern period components in the study area could provide information on the size, number, and types of structures and artifact assemblages distinctive of each era. Cartographic and archival information could serve as a supplement to the archaeological data collected.

Historic Watercraft and Navigation

Previous studies on historic watercraft and waterborne commerce within south Louisiana have shown the importance of navigation to this area and the potential for shipwrecks along its many waterways (Birchett et al. 2001; Flayharty and Muller 1983; Pearson et al. 1989; Stout 1992). The present study offers the opportunity to collect additional data on the watercraft in use in this area, their importance to the local economy, and how the watercraft changed over time.

Field Methods

The research topics outlined in the previous section involve generalizations concerning human occupation of the project area in the past. So few comprehensive surveys have been conducted in the region that all new data collected would be of great value. Also, the sites that can provide these data are fleeting resources, given the rapid rate of land loss in the region. The field methodologies presented below apply to the three major classes of cultural resources expected in the project area—archaeological sites, standing structures, and shipwrecks.

Terrestrial Archaeological Sites

The terrestrial archaeological survey of the project area was conducted in two phases. Phase I consisted of a complete bankline survey of the HNC itself. Phase II involved a systematic survey of those portions of dredged material disposal areas with a high probability for containing archaeological sites.

Bankline Survey of the HNC

As the entire HNC is to be dredged and thus impacted, a complete bankline survey of the canal was conducted. The canal was initially excavated between 1958 and 1962 and has been dredged several times since, all prior to any comprehensive archaeological investigations. The background research and the reconnaissance survey conducted prior to this study clearly showed that the HNC cut through several archaeological sites, and that remnants of some of them survive, despite repeated dredging (Ryan et al. 2005). The canal is known to have impacted two previously recorded sites (16TR12 and 16TR18) and several unrecorded sites. Given the widening of the HNC due to wave wake erosion over the last 40 years, sites not initially impacted by the canal's construction may be newly exposed.

The canal banks were surveyed by two-person crews operating in small boats. Both banks of the canals were carefully examined for cultural material. If the banks were obscured by vegetation, small areas were cleared or the bankline probed at 30 to 50 m intervals. When cultural material was identified, the boat stopped and the bankline was walked, if possible. If sufficient quantities of artifacts were exposed on the surface, systematic surface collections were made. However, in most cases artifact densities were very low and only general collections were obtained.

In order to determine the size, depth, and condition of each site, systematic subsurface testing was conducted. On shell midden sites, a six to eight foot probe was used at 10 to 20 m intervals along one or more transects to determine the depth and extent of the shell deposit both above and below water. Shovel and/or auger tests were excavated at selected locations to determine the type of landform on which the site occurred and to detect earth-midden deposits.

Each site was photographed to provide a record of its condition, and a sketch map was produced showing the locations of all subsurface tests and surface collection units. Important environmental, cultural, and physiographic features, such as canals, modern standing structures, vegetation, etc., were also included on the maps. Precise site positions were obtained with differential GPS.

Survey of Dredge Material Disposal Areas

The project area also included extensive dredge material disposal areas that required survey. Two recent and comprehensive studies conducted in the project region both indicate that the majority of terrestrial archaeological sites are located on once elevated landforms, regardless of site function (Robblee et al. 2000:99; Weinstein and Kelley 1992:379). Some of these landforms remain elevated today, while others have subsided. Other predictive models for site location in south Louisiana have produced similar results (Beavers 1982; Franks and Yakubik 1990; Gagliano et al. 1979; Speaker et al. 1986; Smith et al. 1986). Therefore, all elevated or once elevated landforms, particularly natural levees, in the project area were identified as high probability areas for finding sites and were surveyed.

First, natural levee and abandoned beach landforms in the project area were identified. This included those features exposed at the surface as well as those that May et al. (1984) identify as subsided and buried channels, the reason being that these buried channels have associated natural levees. The size of the natural levees associated with these subsided distributaries is currently unknown. However, for the purposes of this study it was

assumed that levees associated with major distributary channels extend 300 m either side of the channel, while those of smaller distributaries extend 100 m either side of the channel. If the natural levees associated with these channels were obviously wider than the above measurements in some areas, the survey area was expanded to encompass the entire landform. Those zones having a presumed low probability of containing archaeological sites, including all areas identified as inland swamp, fresh marsh, brackish marsh, and salt marsh, were examined visually to verify that all high probability areas had been identified and to investigate any potential sites with surface expression.

Only the three northernmost dredge material disposal areas, Areas 1-3, were dry enough to be examined through pedestrian survey (Plate 2). High probability portions of these areas, totaling 37 ac, were surveyed by crewmembers walking transects spaced 30 m apart and excavating shovel or auger tests at 30 m intervals along each transect. The soil from all shovel and auger tests was screened through 1/4-inch wire mesh, if possible. If artifacts or other indications of human activities were encountered, then the site assessment procedures discussed above were initiated.

The remaining dredge material disposal areas, including Areas 12, 12a, 13, 13b, 14, 14b, 15, 15a, 16, 16b, 19c, 19d, 20c, 20e, 20f, 21, 21b, 23, 24, 24a, 26b, the Falgout Canal disposal area, the East and West areas at the mouth of the HNC, and three areas (labeled A, B, and C) associated with the dredging of Bayou Grand Caillou were located in marsh or open water and were surveyed by two-person crews working from airboats (see Plates1-10). High probability areas were visually examined for evidence of sites, if exposed, and subjected to systematic probing or augering. Approximately 1823 acres were examined in this manner. If artifacts or other indications of human activities were encountered, then the site assessment procedures discussed above were initiated.

Standing Structures

Data collected during CEI's 2005 study (Ryan et al. 2005) indicate that very few standing structures exist in the project area. Most of the project area was forested when the 1956 aerial photographs were shot (Amman International Corporation 1956). Any structures that may have been standing at that time would have been obscured by the trees. The only community in any proximity to the canal is Cocodrie.

While high probability areas for archaeological sites do not always coincide with those for standing structures, in the delta plain they generally do. Therefore, a survey for standing structures was conducted in tandem with the archaeological survey of the HNC bankline and the high probability dredge material disposal areas. Structures located in these project areas were evaluated to determine if they were 50 years old or older. If they were of sufficient age, they were recorded and their National Register eligibility determined.

Shipwrecks

The potential for historic shipwreck sites in the HNC proper is considered relatively low, despite its crossing numerous natural channels. This is principally because these channels tend to be small and were never heavily traveled by watercraft. The HNC itself is not yet 50 years old, and its excavation and repeated dredging presumably would have destroyed any wrecks within its path. However, there is always the possibility that wreck remains occur along the edges of the HNC either where dumped in the past via dredging or newly exposed as the HNC widens due to erosion. Such occurrences would be most likely where the HNC crosses natural channels that may have been used by vessels or have been the site of their abandonment. This includes Bayou Grand Caillou and Bayou Petit Caillou, both of which are crossed by the HNC and have seen heavy use by watercraft throughout the historic period. Previous research has demonstrated that these, and other larger waterways in the region, contain numerous sunken and derelict vessels that have been purposefully abandoned or accidentally lost. On Bayou Grand Caillou itself, Flayharty and Muller (1983) recorded 69 derelict boats, including luggers, trawlers, Lafitte skiffs, and tow boats, as well as modern recreational craft. Six of these vessels were identified as potentially eligible for inclusion in the National Register of Historic Places. In a reconnaissance survey of Bayou du Large, located west of the HNC, Stout (1992) recorded the presence of 37 derelict vessels between Falgout Canal and Grand Pass. These included wooden luggers, Lafitte skiffs, and flatboats as well as steel- and fiberglass-hulled boats. Stout, specifically, notes the historic importance of some of these vessels as "folk boats," vernacular craft that are no longer being made in the area and the remains of which as archaeological sites may provide the best or "only surviving record of their existence" (Stout 1992:23). Thus, there is some possibility that abandoned or sunken vessels could exist where the HNC crosses Bayous Grand and Petit Caillou. The crossings of the lesser bayous, which might have been traveled by small craft such as pirogues or skiffs, may also have been the loci of the abandonment or sinking of these types of vessels.

The likelihood of shipwreck sites in the project area increases somewhat when the proposed dredge material disposal areas are considered. Some of these areas encompass stretches of natural waterways which have seen little alteration since superseded by the HNC in 1962. Among these are the two offshore disposal areas located behind Timbalier Island and Isle Derniere.

The East and West Disposal Areas lie in western Terrebonne Bay on either side of the Houma Navigation Canal at the point where the canal enters the bay. Today, these two areas consist mostly of very shallow open water with small areas of brackish marsh. Immediately west of the two disposal areas is the north-south trending Bayou Petit Caillou.

Even though these two disposal areas contain open water today, neither has a high probability of containing the remains of historic vessels. A principal reason for this is that both of these disposal areas consisted largely of marshlands until relatively recently. For the past 1,000 years or so, subsidence and erosion have worked to remove deltaic landforms that formerly existed in this area. The loss of land has corresponded with an expansion of the shallow water bays in the area, including Terrebonne Bay. A lack of data makes the very early history of land loss and landform change in the East and West Disposal Areas difficult

to assess, but information on the more recent history of these changes can be obtained from historic maps.

The earliest historic map that is useful in addressing specific landform change in this area is the Coast Chart entitled *Caillou Bay and Ship Shoal, Louisiana*, published by the United States Coast and Geodetic Survey in 1908. This map depicts coastal Terrebonne Parish from western Terrebonne Bay to a point west of the gulf entrance of Bayou Grand Caillou and includes the area of the East and West Disposal Areas. In Figure 9, the two disposal areas have been overlaid on the 1908 chart to demonstrate how much marsh existed within each area at that time. As can be seen, marshland occupied the majority of the West Area in 1908. A small portion of the West Area was occupied by Bayou Petit Caillou and by Lake Tambour, a shallow water lake extending along the eastern side of Bayou Petit Caillou. The East Area contained slightly more open water, but even so, well over half of it consisted of marsh in 1908. Most of the marsh falling within these two disposal areas in 1908 has since disappeared. This dramatic degree of land loss is evident by comparing Figure 5-1 with Plate 8, which depicts the modern setting of the two disposal areas. As can be seen, the West Area is almost entirely open water today, and the East Area contains just a remnant of the marshland that existed 100 years ago.

This assessment of landform changes has direct implications on the probability of shipwrecks occurring in these two disposal areas. Most importantly, these two disposal areas consisted largely of exposed land (albeit low marsh) into the twentieth century and these land areas would not have been traveled by watercraft. In addition, no major navigation routes extended through either area during the historic period. Further, there is no evidence that the land in the two areas was well suited for habitation during the recent past, effectively eliminating the possibility of any permanent boat landings or docking facilities there. All of these factors eliminated or, at least, lessened boat travel, docking, or anchoring in and near the two disposal areas thus decreasing the possibility of wrecks or abandoned vessel.

In light of these facts, there is little need to conduct remote-sensing surveys of the East and West Disposal Areas. Additionally, it is noted that the water in extreme western Terrebonne Bay is extremely shallow, meaning it would be impossible to conduct remote-sensing surveys in most of the two disposal areas. The areas were visually examined by airboat surveys.

Once the areas that could be affected by the HNC Deepening project were identified by the Corps of Engineers, New Orleans District, those areas that had a potential for containing the remains of sunken historic watercraft were selected for cultural resources remote-sensing surveys. Five areas were considered to fall into this category. Two of these areas are located in Terrebonne Bay and two are just offshore in the open waters of the Gulf of Mexico (Plates 9 and 10). One of the areas in Terrebonne Bay is located adjacent to the north side (the bay side) of the eastern end Isle Derniere (the eastern most island in the Isles Dernieres chain, sometimes called East Island) and the other is located adjacent to the north side (the bay side) of the western end of Timbalier Island. At these two barrier island locations, the New Orleans District intends to use dredged material recovered in the deepening of the Houma Navigation Canal for island restoration. The two offshore areas are small tracts situated between 1.5 and 2.5 mi offshore on the west side of Cat Island Pass, the

Figure 9. Overlay of the location of the East and West dredged material disposal areas on the 1908 USC&G navigation chart *Caillou Bay and Ship Shoal, Louisiana*.

navigation channel representing the offshore entrance to the Houma Navigation Canal. These two locations will be used for spoil deposition. The fifth area examined by remote-sensing survey consists of a 6.41-mi-long stretch of lower Bayou Grand Caillou that was to be deepened and widened as part of the HNC Deepening Project.

Each of these areas lies in or immediately adjacent to waterways that have been traveled by watercraft throughout the historic period. The two areas in Terrebonne Bay and the two areas offshore are adjacent to natural entrances to Terrebonne Bay, Cat Island Pass and Wine Island Pass, both of which have served as important routes of travel for vessels for the past 250 years or so. In addition, Terrebonne Bay itself has been traversed by boats of a variety of types over the entire historic period. Over this time, an unknown number of vessels have been lost in Terrebonne Bay and in the vicinity of Isle Derniere and Timbalier Island, although records of only a few exist and the exact location of most of these sinkings is unknown. Similarly, as discussed previously, Bayou Grand Caillou has served as an important water route for vessels traveling between the Gulf of Mexico and inland areas of Terrebonne Parish throughout the historic period. In addition, historic settlement occurred along portions of the Bayou Grand Caillou Survey Area enhancing the possibilities of docking and landing facilities and their associated potential for vessel losses and abandonments. Thus, there is a possibility that unknown and unrecorded boat wrecks do exit within the five survey areas.

The remote-sensing survey of these five areas was conducted in several sessions principally because of weather disruptions. The survey of the two areas in Terrebonne Bay and the two offshore areas was initiated on October 19 and ended on October 26, 2007 when bad weather forced a halt to the work. On November 8, the field crew returned to the area and completed this portion of the survey. The New Orleans District did not select the area along Bayou Grand Caillou for examination until November 2007 after the remote-sensing surveys of the other four areas had been completed. The remote-sensing survey of Bayou Grand Caillou was begun on November 13, 2007, but bad weather forced a stop to the survey after just one day of work. Continued bad weather forced the field crew to halt the project and leave the field. The survey was completed on December 2, 3 and 4, 2007. The survey was undertaken by personnel from Panamerican Consultants, Inc. under the direction of Charles Pearson. The field crew consisted of three persons. These were Michael Faught (Project Manager), Jim Duff and Andrew Lydecker of Panamerican Consultants, our subcontractors on this project. The instruments used were a side-scan sonar, marine magnetometer, and recording fathometer, instruments typically employed in remote-sensing surveys of this type.

In the following discussions, the five areas examined by remote-sensing survey are designated as follows: 1. Offshore Survey Area 1 (SPD MI. - 1.7), 2. Offshore Survey Area 2 (SPD MI. – 2.5), 3. the Isle Derniere Survey Area, 4. the Timbalier Island Survey Area, and 5. the Bayou Grand Caillou Survey Area (Plates 8-10). The equipment and survey strategy employed in each area was the same. The areas were systematically examined with survey lines spaced 50 ft (15 m) apart using side-scan sonar, magnetometer and fathometer. The remote-sensing survey of all five areas encompassed 1466.4 acres of water bottom and involved an estimated 225 linear miles of survey. Specifics on the equipment used and the conduct and results of the remote-sensing surveys undertaken in each area are discussed below.

Remote-Sensing Survey Equipment

The remote-sensing survey was conducted with equipment and procedures intended to facilitate the effective and efficient search for magnetic and/or side-scan sonar targets and to determine their exact location as well as to assess the near-surface geology in the survey areas. The positioning system used was a Trimble DSM12/212, Integrated 12-channel Global Positioning System (DGPS). Remote-sensing instruments included a Marine Magnetics Explorer Overhauser magnetometer, a Marine Sonic Technology side scan sonar, and a recording fathometer.

Differential Global Positioning System

Accurate positioning is essential during the running of survey lines and for returning to recorded locations for supplemental remote-sensing operations or ground-truthing activities. These positioning functions were accomplished on this project using a Trimble Navigation DSM12/212 global-based positioning system that obtains sub-meter accuracy in positions. The DSM12/212 attains differential capabilities by internal integration with a Dual-channel MSK Beacon receiver. This electronic device interprets transmissions both from satellites in Earth's orbit and from a shore-based station to provide accurate coordinate positioning data for offshore or riverine surveys. Positioning was provided through continuous real-time tracking of the moving survey vessel by utilizing corrected position data provided by an on-board GPS, which processed both satellite data and differential data transmitted from a shore-based GPS station utilizing Radio Technical Commission for Maritime Services (RTCM) 104 corrections. The differential station monitored the difference between the position that the receiver derived from satellite transmissions and that station's known position. The DGPS aboard the survey vessel constantly monitored the navigation beacon radio transmissions in order to provide a real-time correction to any variation between the satellite-derived and actual positions of the survey vessel. Positioning data were recorded in Louisiana South State Plane coordinates, feet, based on the 1983 North American Datum (NAD 83).

Both the satellite transmissions and the differential transmissions received from the shore-based navigation beacon were entered directly into a Sony VAIO computer. The computer and associated hardware and software calculated and displayed the corrected positioning coordinates for every second and stored the data. Positioning information was stored on magnetic disk aboard the survey vessel.

All positioning coordinates are based upon the position of the antenna of the DGPS. Each of the remote-sensing devices was oriented to the antenna and their orientation, relative to the antenna, (known as layback) was noted (Figure 10). This information is critical in the accurate positioning of targets during the data analysis phase of the project and repositioning for any subsequent archaeological activities. The layback of the magnetometer sensor was 72 ft aft and it was floated at or near the surface during the survey. The layback for the side scan sonar sensor was 16 ft aft (of the DGPS antenna) and 8 ft starboard. The subbottom profiler sensor was mounted off the starboard (right) bow of the vessel about 2 ft beneath the lake surface.

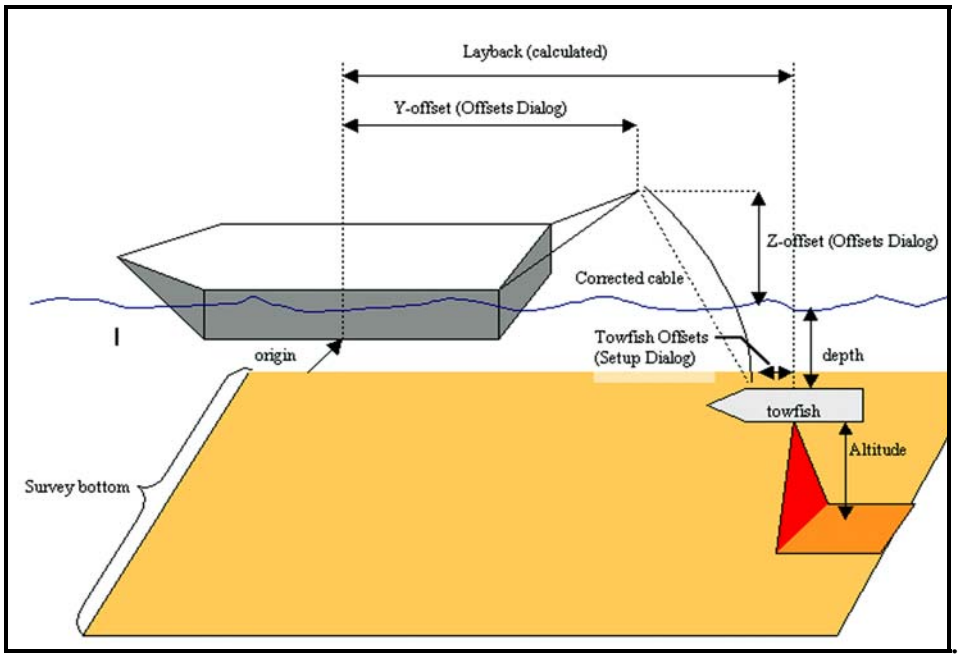

Figure 10. Equipment schematic illustrating layback (Courtesy of Coastal Oceanographics, Inc.).

Magnetometer

The magnetometer used was a Marine Magnetics SeaSpy Overhauser magnetometer. The magnetometer measures and records both the Earth's ambient magnetic field and the presence of magnetic anomalies (deviations from the ambient background) generated by ferrous masses and various other sources. These measurements are recorded in gammas, the standard unit of magnetic intensity (equal to 0.00001 gauss). Magnetic data were collected at one-second intervals, both digitally and graphically, providing a record of both the ambient field and the character and amplitude of anomalies encountered. These data were stored electronically in the navigation computer.

The ability of the magnetometer to detect magnetic anomalies, the sources of which may be related to submerged cultural resources such as shipwrecks, has caused the instrument to become a principal remote-sensing tool of marine archaeologists. While it is not possible to identify a specific ferrous source by its magnetic field, it is possible to estimate shape, mass, and alignment characteristics of anomaly sources based on the magnetic field recorded. There are other sources such as electrical magnetic fields surrounding power transmission lines, underground pipelines, navigation buoys, or metal bridges and structures that can significantly affect magnetometer readings. However, an abundance of research suggests that the ferrous components of submerged historic vessels tend to produce magnetic signatures that display distinctive characteristics as is discussed below.

For this project, the magnetometer was interfaced with a Sony VAIO laptop computer utilizing the navigation software Hypack® for data storage and management. It was also interfaced with the positioning system allowing positioning fix points to be integrated with each magnetometer data point.

Side Scan Sonar

The side scan sonar used was a Marine Sonic Technology (MST) Sea Scan side scan sonar system. The side scan sonar is an instrument that, through the transmission of dual fan-shaped pulses of sound and reception of reflected sound pulses, produces an acoustic image of the bottom. Under ideal circumstances, the side scan sonar is capable of providing a near-photographic representation of the bottom on either side of the line of survey. The MST Sea Scan side scan sonar unit utilized on this project was operated with an integrated single frequency 600 kHz towfish. The Sea Scan PC has internal capability for removal of the water column from the instrument's video printout as well as correction for slant range distortion. This side scan sonar was utilized with the navigation system to provide manual marking of positioning fix points on the digital printout. Side scan sonar data are useful in searching for the physical features indicative of submerged cultural resources. Specifically, the record is examined for features showing characteristics such as height above bottom, linearity, and structural form. Additionally, potential acoustic targets are checked for any location correlation with the data derived from the simultaneous magnetometer survey.

The MST Sea Scan PC side scan sonar was linked to a towfish that employed a 600 kHz power setting and a variable side range of up to 100 meters-per-channel (200-meter coverage per line) on each of the side scan lines that were run. The 20 meters-per-channel setting was chosen making it possible to collect acoustic data over a 40-meter-wide (131-ft-wide) area on each line. This setting provides resolution detail and complete overlapping coverage with the 50-ft (15 m) line spacing to insure full examination of the survey area.

Fathometer

The recording fathometer was used primarily to obtain information on bathymetry in the surveyed areas, but it also served to identify objects that extend above the bottom. All bathymetry measurements are presented in feet.

Survey Vessel

The vessel employed during the remote-sensing survey was Panamerican Consultants' 25-ft *Parker*, a modified V-hull motor vessel, powered by a 225-hp Yamaha Saltwater-Series II engine. The vessel has a covered cabin and ample deck area for the placement and operation of the necessary remote-sensing equipment. The vessel conformed to all U.S. Coast Guard specifications, according to class, and had a full compliment of safety equipment. Appropriate emergency supplies, including lifejackets, spare parts kit, tool kit, first-aid supplies, flare gun, air horns and paddles were aboard. The vessel was rigged with a Honda 2000 electric generator to power the electronic devices.

Survey Procedures

The survey procedures for the two areas in Terrebonne Bay and the two offshore areas were similar. Corner coordinates for the areas were entered into the navigation program Hypack® and pre-plotted survey lines (i.e., "track lines") were produced with 50-ft offsets. These track lines were oriented parallel to the long axes of the two island restoration areas in Terrebonne Bay. The two offshore areas, which are square in area, were surveyed with survey lines oriented in a northwest-southeast direction, an orientation that took into account the direction of waves and current. The survey lines run along Bayou Grand Caillou were spaced 50 ft apart and followed the course of the bayou. During the surveys of all areas, the helmsman steered via a video monitor linked to the DGPS and navigational computer, which displayed the real-time position of the path of the survey vessel along each survey track line. The speed of the survey vessel was maintained between 3.5 and 4.0 knots for the uniform acquisition of data. The navigation system determined vessel position along the actual line of travel every second. One computer recorded positioning and magnetometer data every second while a separate computer recorded all side scan sonar returns during the survey. Magnetic readings were obtained every second which, given the vessel speed, represents a reading every three to four feet along a track line. The positioning points along the line traveled were recorded on the computer hard drive and the magnetic data were also stored digitally. All track lines extended at least 100 ft beyond the ends of the survey areas.

Upon completion of the magnetometer surveys, the raw positioning and magnetometer data were edited within the Hypack® computer program. The edited file was input into the system's contouring program to produce magnetic contour maps. The maps, field notes and magnetometer digital strip charts were then analyzed to create a list of magnetic anomalies that were indicative of potentially significant cultural resources. Afterwards, the side-scan sonar data were reviewed for any evidence of submerged objects.

These general procedures were followed in each area surveyed. The specifics of remote-sensing survey of each area, and the findings, are discussed in a later section of this report.

Curation Statement

Following the completion of all analyses and acceptance of the final report, all artifacts and records will be curated with:

State of Louisiana
Department of Culture, Recreation and Tourism
Division of Archaeology
P.O. Box 44247
Baton Rouge, Louisiana 70804-4247
(225) 342-8170

in the curation facility at:

Galvez Building
602 N. Fifth St.
Baton Rouge, Louisiana 70802
(225) 342-4475.

CHAPTER 6

RESULTS

Archaeological Sites

The terrestrial archaeological surveys examined four previously recorded archaeological sites and located 12 unrecorded sites (Table 7). Each of the sites is discussed below beginning at the north end of the project area and continuing south.

Table 7. Archaeological Sites Investigated During the Survey.

Site No.	Location	Size	Site Type	Age	Eligibility
16TR12	HNC MP 11.8	40 x 50 m	shell midden	Coles Creek and Plaquemine	not eligible
16TR14	West Area	60 x 20 m	shell midden	post Tchula period	not eligible
16TR18	HNC MP 11.8	100 x 20 m	shell midden	Coles Creek.	not eligible
16TR72	HNC MP 17.7	50 x 10 m	shell midden	Plaquemine	unable to relocate
16TR312	HNC MP 33.2	140 x 20 m	shell midden	post Tchula period	not eligible
16TR313	HNC MP 29.7	100 x 25 m	shell midden	Plaquemine	not eligible
16TR314	HNC MP 28.8	100 x 25 m	shell midden	post Tchula period	not eligible
16TR315	HNC MP 28.9	45 x 35 m	shell midden	post Tchula period	not eligible
16TR316	HNC MP 26.5	75 x 20 m	shell midden	Plaquemine	not eligible
16TR317	HNC MP 27.6	40 x 15 m	shell midden	post Tchula period	not eligible
16TR318	Area 21b	30 x 15 m	shell midden	Coles Creek and Plaquemine	not eligible
16TR319	HNC MP 19.2	40 x 15 m	shell midden	Coles Creek	not eligible
16TR320	HNC MP 15.8	60 x 15 m	shell midden	Coles Creek?	not eligible
16TR321	HNC MP 11.1	40 x 15 m	shell midden	post Tchula period	not eligible

16TR312 (HNC-1)

This site was initially identified by CEI in late 2003 during the field trip made at the time of the records check and literature review for the HNC Deepening Project (Ryan et al. 2005:102). The site is located at about M.P. 33.2 on the west bank of the HNC where it cut an abandoned deltaic distributary now occupied by Bayou La Carpe (Plate 2). A scatter of *Rangia* and oyster shell was present along the bank of the HNC for a distance of about 125 m and artifacts occurred in low frequencies in this scatter. The initial visit produced four sherds of Baytown Plain, *var. unspecified*.

Since 2003, the site has been disturbed by the construction of a shell and gravel road. A borrow pit has been dug parallel to the HNC and about 30 m from its bank, and the fill from this pit has been placed over the site to form the base for the road (Figures 11-12). In addition, rip-rap has been placed along the bank line of the HNC to prevent erosion. During the present survey, probing was conducted at 20 m intervals along two lines, one on either side of the road for a distance of 200 m. From N20 to N160 the probing revealed an upper, compact deposit of shell and fill related to road construction that ranged from 30 to 70 cm thick. Beneath that, several probes encountered what were initially interpreted as additional shell lenses at varying depths. However, when cores were taken adjacent to some of these probe holes no shell lenses were present, only thick deposits of bluish gray clay with occasional shell fragments (Figure 13).

Figure 11. View of 16TR312 from HNC looking northwest.

It appears that 16TR312 represents the remains of one or more shell middens that were located on the natural levee of the distributary channel now occupied by Bayou La Carpe. The initial dredging of the HNC redeposited the shells and artifacts from this midden on the bank of the canal where it was noted by Ryan et al. (2005). Since that time, a road has been built over the redeposited shell and rip-rap has been placed along the bank of the HNC. Based on the systematic probing and cores, intact deposits are not likely to be present.

Figure 12. Aerial photograph of 16TR312 showing the location of probe holes and cores. Plus symbols indicate probe holes initially thought to be positive for shell.

16TR323 (HNC-2)

This site, identified by CEI in 2003, is located at about M.P. 31.5 on the west bank of the HNC where it cut the channel of Bayou La Carpe (Plate 2). It consists of a scatter of *Rangia* and a few oyster shells that extend along the bank of the canal from Bayou La Carpe south to a well canal. The only artifacts collected in 2003 were three sherds of Baytown Plain, *var. unspecified* (Ryan et al. 2005:Table 6-1).

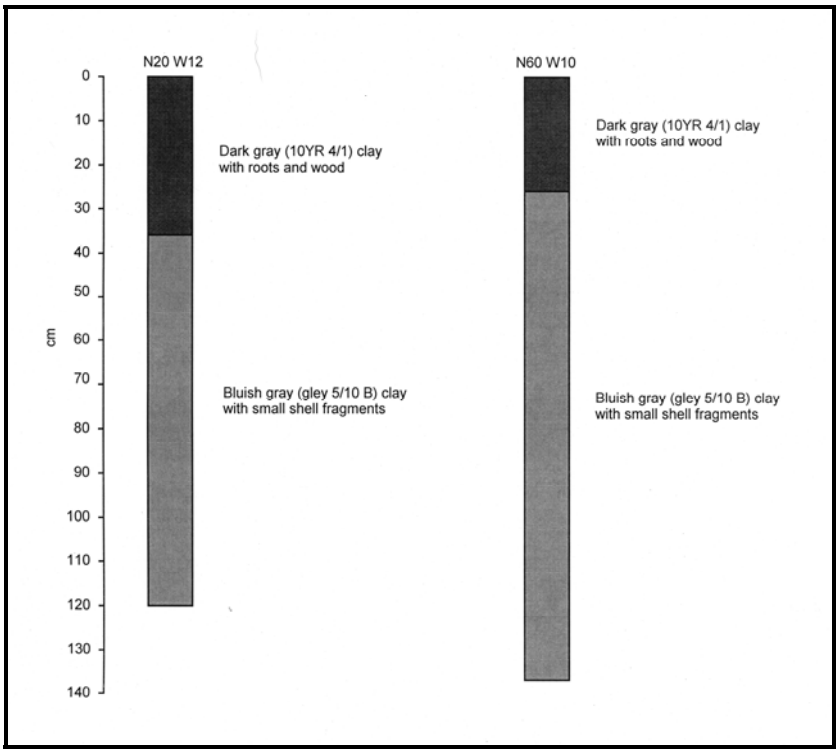

Figure 13. Cross-section based on cores taken at 16TR312.

When examined during the present survey, the shell scatter was found to extend about 100 m along the bank of the HNC in the upper portion of a spoil deposit that was about 1.5 m thick (Figures 14–15). Several small beach deposits of shell were also present along the waterline. Probing was conducted at 10 m intervals along the bank in the area of the shell scatter but no evidence of intact shell midden could be located beneath the spoil.

HNC-6

This possible site, identified by CEI in 2003, is located at about M.P. 29.7 on the east bank of the HNC (Plate 3). It lies just south of a pipeline right-of-way and across the canal from 16TR313 (Figure 16). When initially noted in 2003, HNC-6 was described as consisting of a lens of *Rangia* and oyster shells in the bank of the HNC and a beach deposit of shells along the waterline. The only artifact noted at that time was a sawn pig vertebra.

When revisited during the present survey, HNC-6 was found to consist of a sparse scatter of shells on the surface of a spoil deposit around an artificial cut in the bank of the HNC (see Figure 16). A wave-washed deposit of shells was also present at the east end of the cut. A careful examination was made of the spoil and beach deposits but no prehistoric artifacts were noted. Probing conducted at approximately 10 m intervals across the shell scatter produced no evidence of intact shell midden. Considering the absence of prehistoric artifacts from HNC-6, its association with a recent cut in the bank line of the HNC and its proximity to a pipeline right-of-way, it now seems likely that it represents a recent deposit of shells possibly related to the construction or maintenance of the pipeline. For this reason, HNC-6 has not been recorded as an archaeological site.

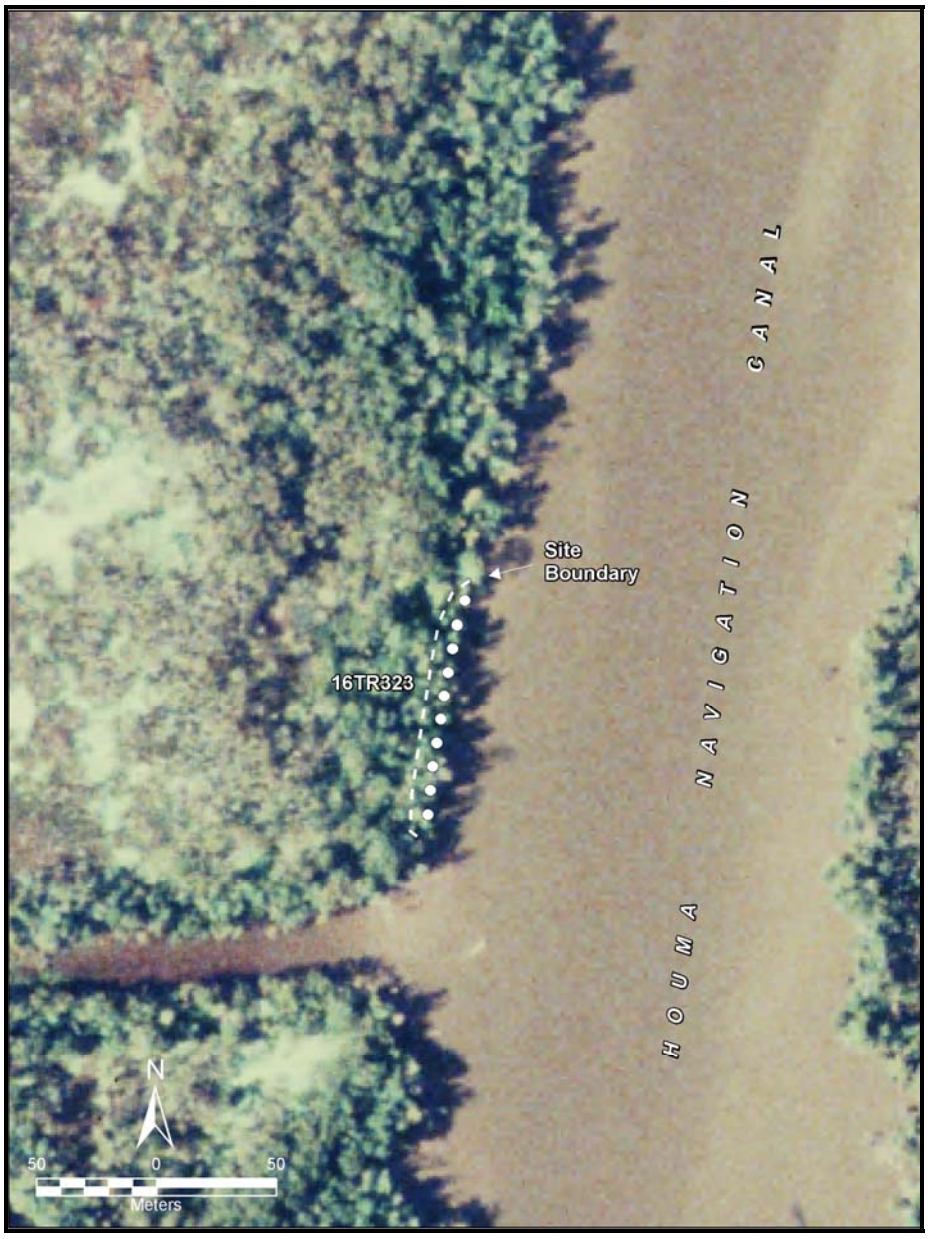

Figure 14. Aerial photograph of 16TR323 showing the estimated site boundary and the location of probe holes.

16TR313 (HNC-3)

Like the previous site, this site was identified by CEI in 2003. It consisted of a scatter of *Rangia* shell and a few oysters at about M.P. 29.7 on the west bank of the HNC near the point where it cut the channel of Bayou Boeuf (Plate 3). Six sherds of Baytown Plain, *var. unspecified* were recovered during that visit, but an earlier trip to the site by George Castille yielded a collection that included sherds of Plaquemine Brushed, *var. Plaquemine*; Mazique Incised, *var. Manchac*; Coles Creek Incised, *var. Hardy* and Mississippi Plain (Ryan et al. 2005:106). The latter collection suggests that a Plaquemine occupation is represented.

Figure 15. View of 16TR323 from HNC looking west.

The site now consists of a sparse scatter of shell that extends for about 100 m along the HNC on the surface of dredge spoil (see Figure 16). Small beach deposits of reworked shell and artifacts are also present in places along the waterline (Figure 17). One of these beach deposits yielded a sherd of Mazique Incised, *var. Manchac* during the present survey (Figure 18). Probing was conducted at 10 m intervals along the shell scatter, but no evidence of buried shell deposits was found beneath the dredged material, only soft clay. It appears that 16TR313 represents a small Plaquemine shell midden that was disturbed by dredging of the HNC and subsequent bank line erosion. Intact deposits are apparently no longer present.

16TR315 (HNC-5)

This site, which was also identified in 2003, is located on the east bank of the HNC at about M.P. 28.9 just north of 16TR314 across the side canal (Plate 3). It consists of a scatter of *Rangia* shells and a few artifacts mixed in spoil from the dredging of the HNC and the side canal. The only artifacts recovered by Ryan et al (2005:Table 6-1) were two sherds of Baytown Plain, *var. unspecified*.

When visited during the present survey, 16TR315 was found to consist of a sparse scatter of shell that extends about 45 m along the bank of the HNC and 35 m back from it (Figures 19–20). The shell occurs on the surface of and mixed with 1.0 to 1.25 m of spoil.

Two probe holes were placed 10 m apart in the site area. Neither of these encountered evidence of intact shell midden deposits. This site appears to represent another small shell midden that was disturbed by dredging of the HNC and has now been redeposited along its banks.

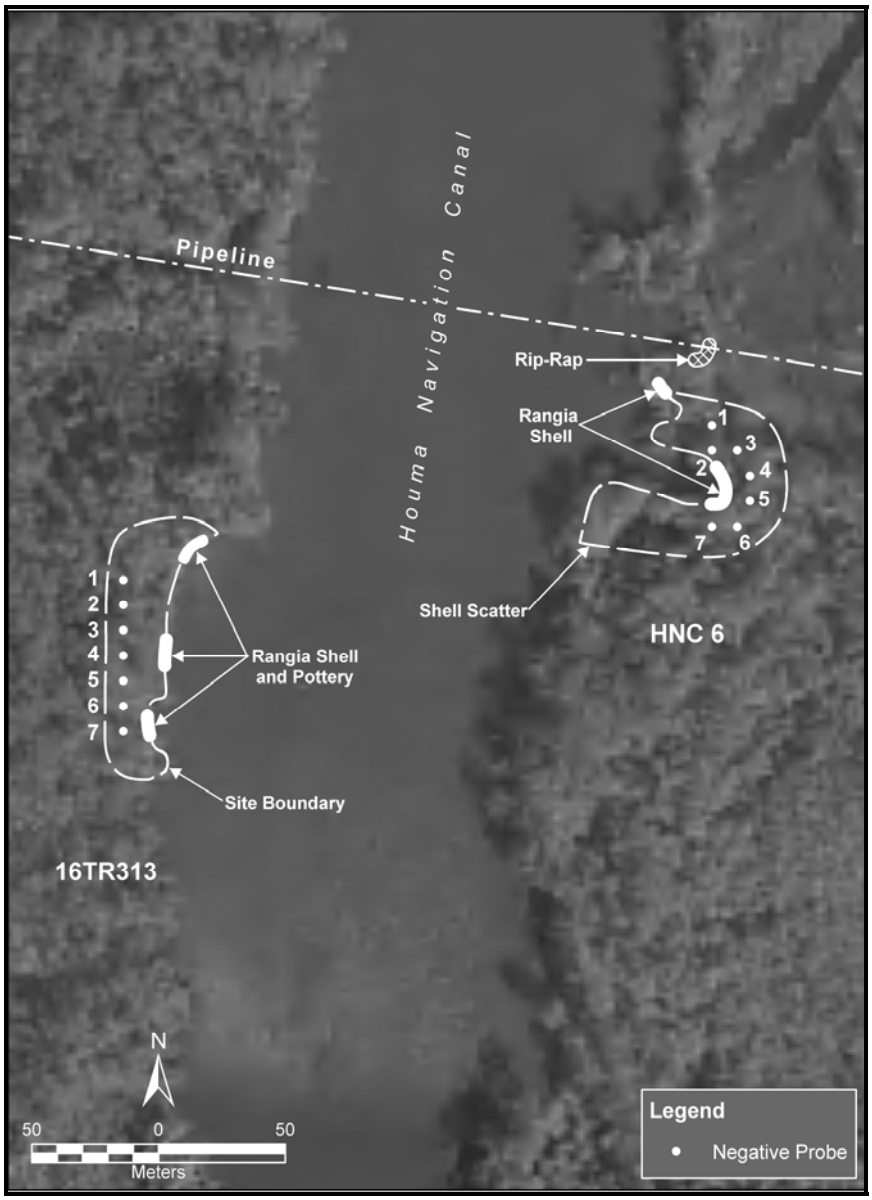

Figure 16. Aerial photograph of HNC-6 and 16TR313 (HNC-3) showing the estimated site boundary and the location of probe holes.

16TR314 (HNC-4)

This site, also identified by CEI in 2003, is located at about M.P. 28.8 on the east bank of the HNC where it cut another portion of the channel of Bayou Boeuf (Plate 3). A short side canal defines the northern limit of the site, which consists of a scatter of *Rangia* shells and a few artifacts mixed with spoil from dredging the HNC and the side canal (Figure

21). The only artifacts recovered from the site in 2003 were three sherds of Baytown Plain, *var. unspecified* found in small beach deposits along the bank of the HNC (Ryan et al. 2005:Table 6-1).

Figure 17. View of 16TR313 on the west bank of the HNC looking northwest.

Figure 18. Rim sherd of Mazique Incised, *var. Manchac* from 16TR313.

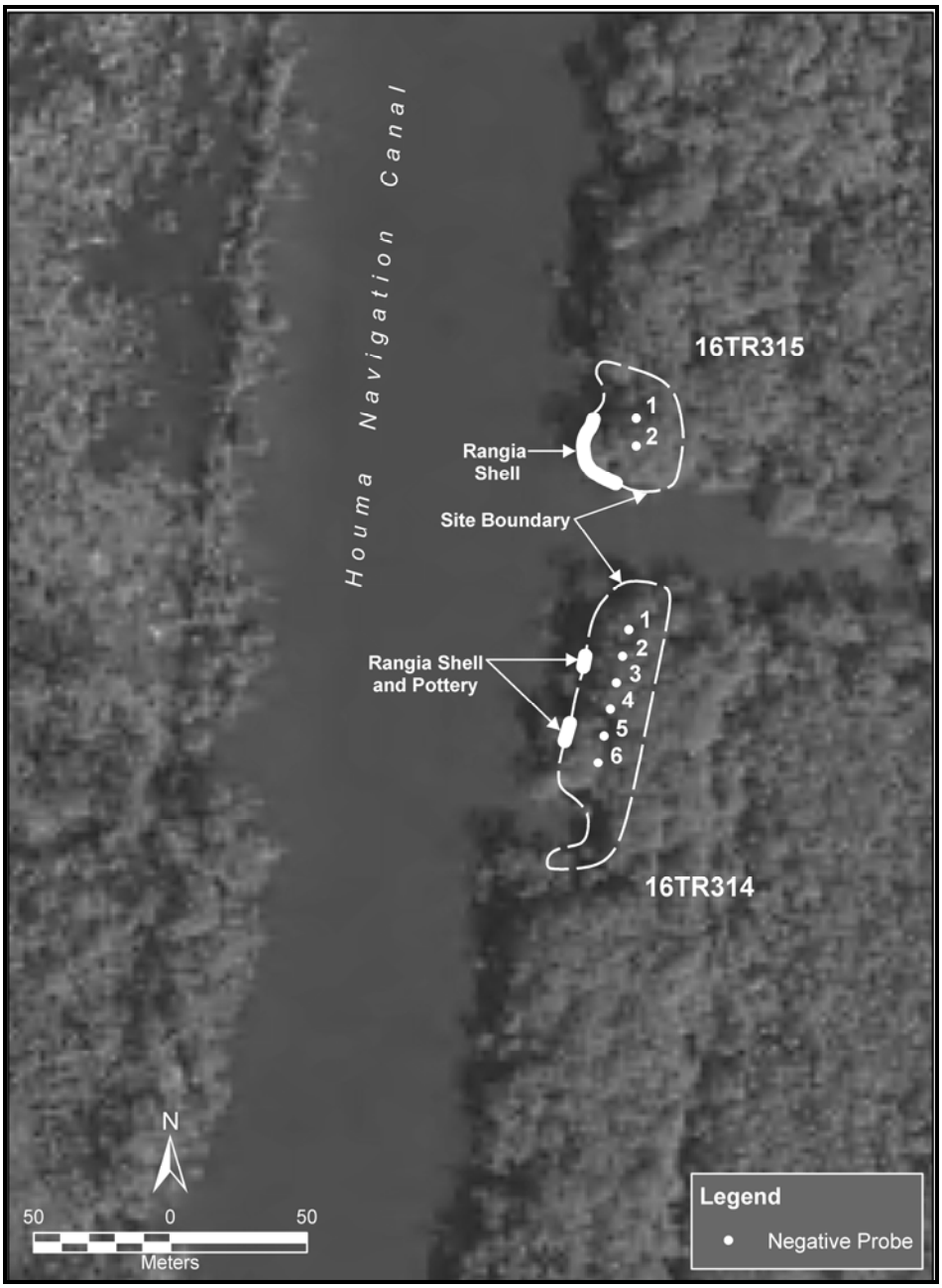

Figure 19. Aerial photograph of 16TR314 (HNC-4) and 16TR315 (HNC-5) showing the estimated site boundaries and the locations of probe holes.

When examined during the present survey, the site consisted of a sparse scatter of shell over an area that extends about 100 m along the HNC and 25 m back from its bank (see Figure 20). Eroded areas along the bank show that between 1.0 and 1.25 m of spoil have been deposited in this location (Figure 22). The *Rangia* shells and artifacts are mixed within this spoil. Probing was conducted at 10 m intervals along the bank of the HNC but no evidence of intact shell midden was encountered. Site 16TR314 may represent a second small shell midden disturbed by the HNC in this location or merely another portion of site 16TR315. In either case, intact deposits are apparently no longer present.

Figure 20. View of 16TR315 from HNC looking northeast.

Figure 21. View of 16TR314 from HNC looking northeast.

Figure 22. Closeup of spoil exposed in bank at 16TR314.

16TR317 (HNC-16)

This site consists of a sparse scatter of *Rangia* and oyster shell located at about M.P. 27.6 on the west bank of the HNC near the point where it cut Bayou Provost (Plate 3). The bank in this area is covered by about 1 m of spoil from dredging the HNC but shell extends for about 40 m along the base of the bank in a beach deposit (Figure 23). A single sherd of Baytown Plain, *var. unspecified* was collected from the reworked shell. Probing was conducted at 10 m intervals along the bank line behind the beach deposit, but no intact shell midden could be located. This site represents another small shell midden disturbed by dredging of the HNC and now redeposited along its bank line.

16TR316 (HNC-7)

This site, also located in 2003, consists of a scatter of *Rangia* and some oyster shells at about M.P. 26.5 on the east bank of the HNC where it cut Bayou Guilliame (Plate 3). Ryan et al. (2005:Table 6-1) obtained a small collection of pottery from the site including sherds of Mound Place Incised on Baytown paste and Baytown Plain, *var. Addis*, suggesting that a Plaquemine occupation is present.

When examined during the present survey, the site was found to consist of a sparse surface scatter of shell that extends about 75 m along the bank of the HNC and 20 m back from it (Figure 24). A beach deposit of shell is present along the water's edge in the southern portion of this area (Figure 25). This beach deposit produced the only artifact found during

the present survey, a sherd of Baytown Plain, *var. unspecified*. Probing was conducted at 10 m intervals along a line parallel to the bank line of the HNC but no evidence of intact shell midden was encountered, only unconsolidated clays. Like the previous sites, 16TR316 appears to represent the remnant of a shell midden that was disturbed by the dredging of the HNC and redeposited along its bank line.

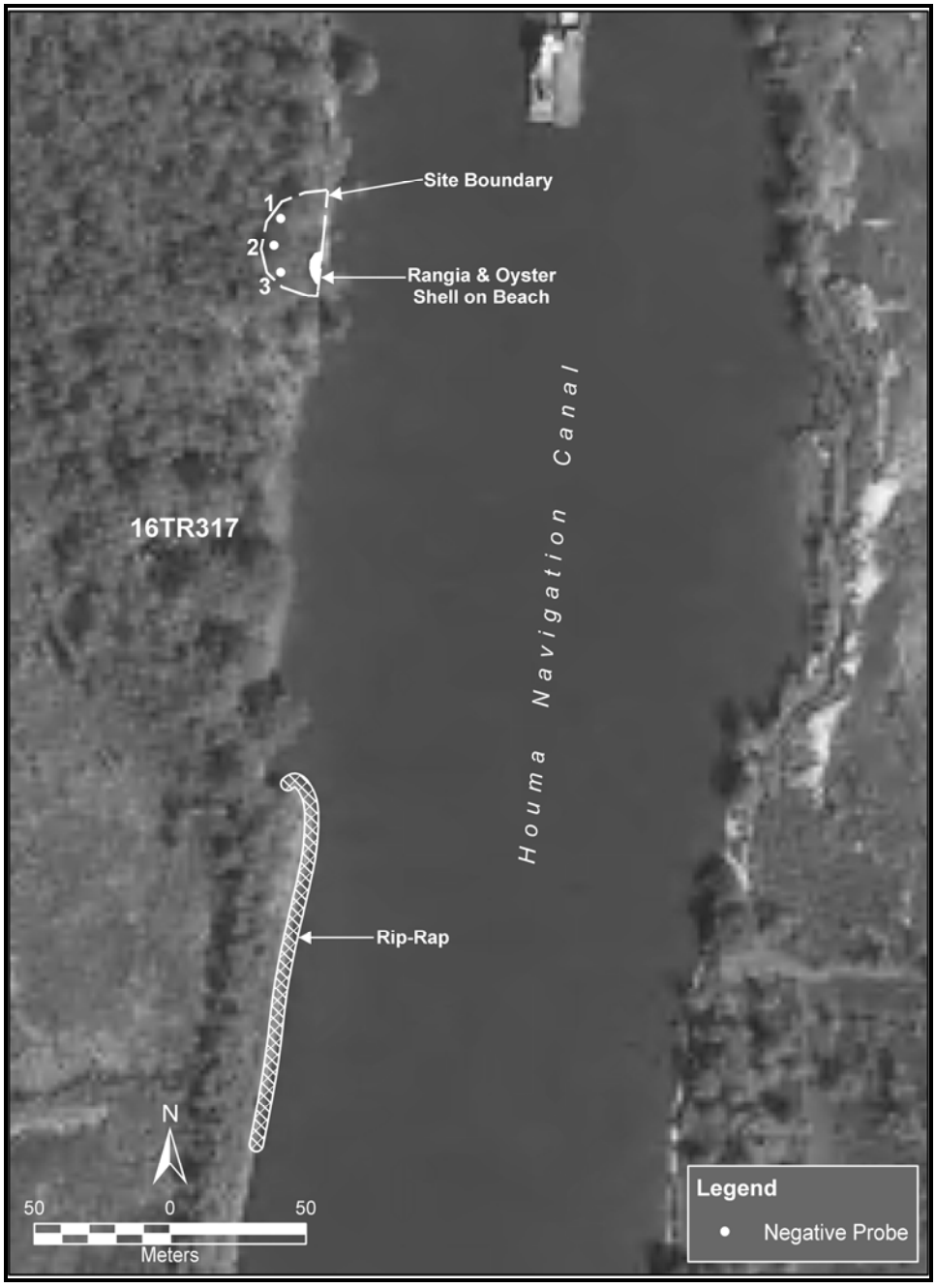

Figure 23. Aerial photograph of 16TR317 showing the estimated site boundary and the locations of probe holes.

Figure 24. Aerial photograph of 16TR316 showing the estimated site boundary and the locations of probe holes.

16TR318 (HNC-19)

This site is located on the north bank of Mound Bayou at its junction with Bayou Grand Caillou (Plate 5). The Mound Bayou site (16TR22), a small two-mound group, is

Figure 25. View of 16TR316 from the HNC looking northeast.

located on the opposite side of Mound Bayou. Site 16TR318 consists of a sparse beach deposit of shell that extends for about 30 m along the bank line of Mound Bayou (Figure 26). A small collection of pottery was obtained from the shell including a sherd of Harrison Bayou Incised and three sherds of Baytown Plain with rim straps (Table 8). The nearby Mound Bayou site has Coles Creek and Plaquemine occupations (Saunders 1994a:90-93) and it appears that this site is contemporary with it. Probing was conducted at 10 m intervals along the bank line behind the shell beach at 16TR318 but this produced no evidence of intact shell midden deposits. Mound Bayou was dredged at some point in the past to permit oil drilling rigs to go up it, and this site represents the remains of a small shell midden that was destroyed in the process.

16TR319 (HNC-20)

This site consists of a beach deposit of *Rangia* and oyster shells located at about M.P. 19.2 on the west side of the HNC at the point where it cut Bayou Plat (Plate 5). The shell extends for about 40 m along the bank of the HNC (Figure 27). A small collection of pottery was obtained from it including a sherd of Coles Creek Incised, *var. unspecified* and three sherds of Baytown Plain, *var. unspecified* (Figure 28). Probing was conducted at 10-15 m intervals behind the shell beach but no intact shell midden deposits were located. This site represents another small shell midden disturbed by dredging of the HNC and now redeposited along its bank line.

Figure 26. Aerial photograph of 16TR318 showing the limits of the beach deposit of shell and the locations of probe holes.

Table 8. Artifacts Recovered from 16TR318.

Ceramic Type	Variety	Rim	Body	Base	Total
Baytown Plain					
	var. unspecified				
	(with rim strap)	3			3
	(shallow bowl)	1			1
Harrison Bayou Incised					
	var. Harrison Bayou		1		1

Figure 27. Aerial photograph of 16TR319 showing the estimated site boundary and the locations of probe holes.

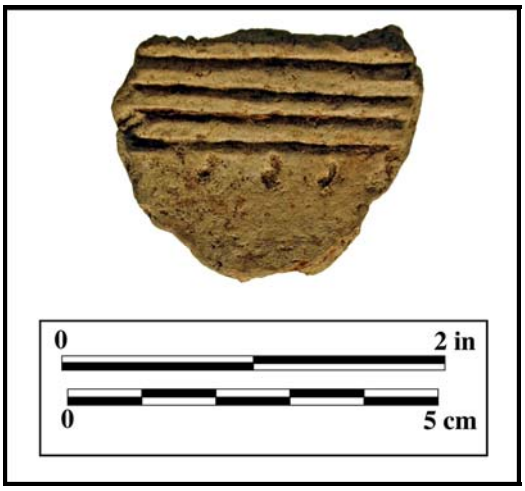

Figure 28. Sherd of Coles Creek Incised, *var. unspecified* from 16TR319.

16TR72 (Four Point Bayou)

This is a shell midden located on Four Point Bayou that was initially recorded by Randolph Bazet in 1953. It was revisited by New World Research in 1978 and at that time a small area of intact deposits was located in the north bank of a canal leading from Four Point Bayou to the HNC (Altschul 1978:Figure 35). Altschul's sketch map shows the deposits to be about 100 m from the HNC. The ceramics recovered suggest that a Plaquemine occupation was represented at the site. Since 1978, the bank line in the site area has been bulkheaded and fill has been dumped where Altschul reported the intact deposits. A small marine gas station has been built over the eastern portion of the site area and houseboats line the bank all along there (Plate 5; Figure 29). It is possible that intact deposits are still present at the site but, if so, they are now buried by fill and a recent structure. Regardless, the site is located far enough from the HNC that it should not be affected by the proposed dredging.

Figure 29. View of the location of 16TR72 from the HNC looking northeast.

16TR320 (HNC-21)

This site consists of a beach deposit of *Rangia* and oyster shells located at about M.P. 15.8 on the east side of the HNC where it cut Bayou Sale (Plate 7). The shell extends about 60 m along the bank of the HNC northwest from Bayou Sale. A small collection of pottery, five sherds of Baytown Plain, *var. unspecified*, was obtained from this area. One of the sherds exhibits a rim strap, suggesting that a Coles Creek occupation may be represented. Probing was conducted at 10-15 m intervals along the bank behind this beach deposit but no evidence of intact shell midden could be located (Figure 30). Like the previous sites,

16TR320 is a small shell midden that was disturbed by the dredging of the HNC and has now been redeposited along its bank line.

Figure 30. Aerial photograph of 16TR320 showing the estimated site boundary and the locations of probe holes.

16TR18

Like the two previous sites, this site was recorded by McIntire in 1951 as a shell midden with little or no intact deposits. He listed its occupation as prehistoric unknown, but Ryan et al. (2005:Table 6-1) collected a sherd of Coles Creek Incised, *var. unspecified* from it. The site was probably impacted by the excavation of the HNC and now consists of a redeposited shell scatter located on the north bank of Bayou Petit Caillou just east of the HNC (Plate 8; Figures 31–32). No artifacts were located during the present survey. Probing was conducted at 10 m intervals behind the shell scatter but this encountered only unconsolidated marsh deposits. It appears that construction of the HNC and subsequent bank line erosion have now destroyed any remaining intact deposits at this site.

Figure 31. Aerial photograph of 16TR18 showing the estimated site boundary and the locations of probe holes.

Figure 32. View of 16TR18 from Bayou Petit Caillou looking north.

16TR12

This site was initially recorded by William McIntire in 1951, prior to the excavation of the HNC, as a largely wave-washed shell midden located on Bayou Petit Caillou. Based on his ceramic identifications, it contained evidence of Coles Creek and Plaquemine occupations. The site was impacted by dredging of the HNC and now consists of a redeposited scatter of shell located on the west bank of the HNC at about M.P. 11.8 and the north bank of Bayou Petit Caillou (Plate 8; Figures 33–34).

Figure 33. Aerial photograph of 16TR12 showing the estimated site boundary and the locations of probe holes.

Ryan et al. (2005:87) collected a single sherd of Baytown Plain, *var. Addis* from the bank of the HNC during their reconnaissance survey but none were found during the present survey. Probing was conducted at roughly 10 m intervals behind the shell scatter in an effort to locate intact deposits of shell midden but only unconsolidated marsh deposits were encountered. It appears that construction of the HNC and subsequent bank line erosion has destroyed any remaining intact portions of the site.

Figure 34. View of 16TR12 from HNC looking northwest.

16TR14

This site was also recorded by McIntire in 1951 and, like the previous site, it was described as a shell midden that was "almost destroyed". The site form lists its age as prehistoric unknown, but Ryan et al. (2005:87) collected a single sherd of Baytown Plain, *var. unspecified* from the site indicating that the occupation can at least be dated some time after the Tchula period.

The site now consists of a redeposited scatter of shell located on the east bank of Bayou Petit Caillou (Plate 8; Figures 35–36). No artifacts were found during the present survey. Probing at 10 m intervals behind the shell scatter encountered only marsh sediments. Like the previous site, 16TR14 appears to have been destroyed by bank line erosion.

16TR321 (HNC-22)

This site consists of a beach deposit of oyster and a few *Rangia* shells located at about M.P. 11.1 on the west side of the HNC east of Bay Couteau (Plate 8). The shell extends for about 40 m along the bank of the HNC. A single sherd of Baytown Plain, *var. unspecified* was recovered from this deposit. Probing was conducted at 10-15 m intervals adjacent to the shell deposit but no intact shell midden could be identified (Figure 37). This site represents another small shell midden disturbed by dredging of the HNC and now redeposited along its bank line.

Figure 35. Aerial photograph of 16TR14 showing the estimated site boundary and the locations of probe holes.

Figure 36. View of 16TR14 from Bayou Petit Caillou looking northeast.

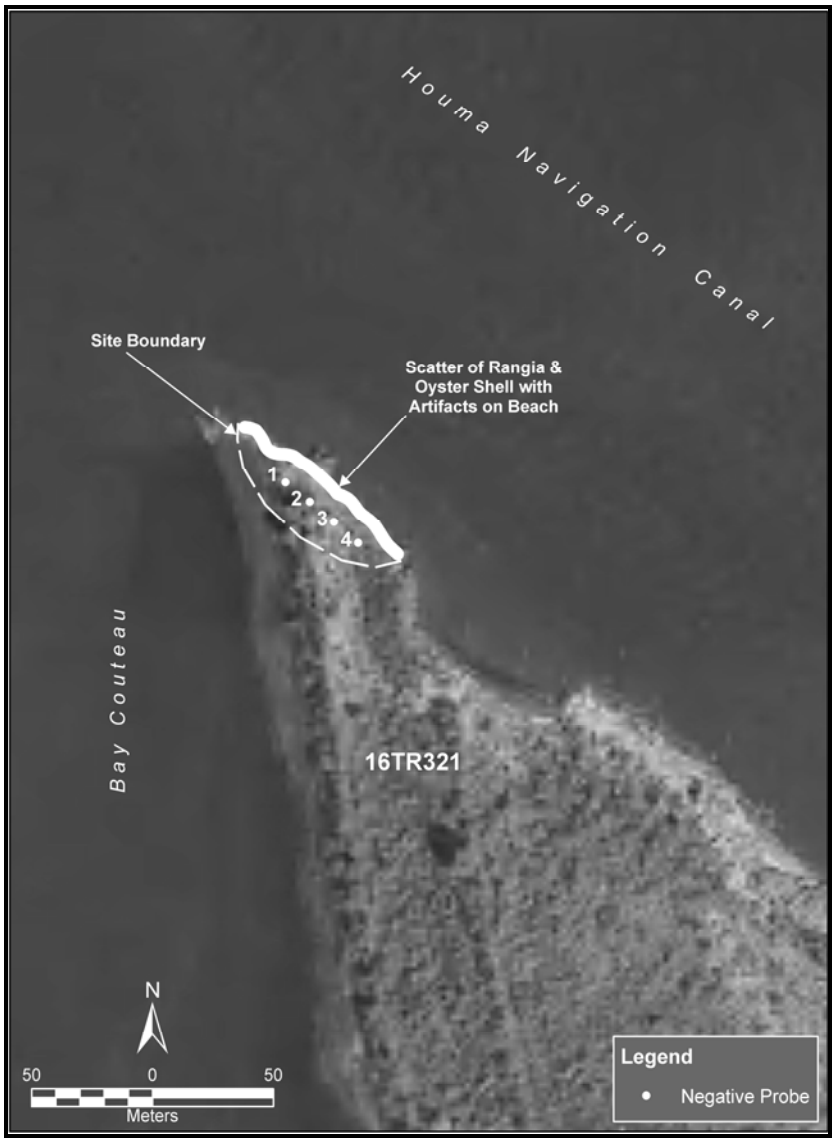

Figure 37. Aerial photograph of 16TR321 showing the location of the beach deposit of shell and the probe holes.

16TR322 (Four Point Bayou Mound)

This is a possible mound site located at the junction of Bayou Sale and Four Point Bayou (Plate 7). It was noted while traveling down Four Point Bayou to survey Disposal Area 21. The site lies about 300 m west of the disposal area, and since we did not have permission to go on this property it could not be examined closely. The site is located on the east side of Bayou Sale and the north side of Four Point Bayou. It appears to consist of a single earth mound about 30 m in diameter and 1 m high (Figure 38). The Bayou Sale Mounds (16TR189), a three mound group, are located only about 500 m south of this site on the west side of Bayou Sale (Figure 39). Obviously, further investigation is needed to determine whether this feature is a mound, but until that time it should be avoided by this project or any others planned in the area.

Figure 38. View of possible earth mound at 16TR322 from Four Point Bayou looking north.

Figure 39. Aerial photograph of the Four Point Bayou Mound (16TR322) and the Bayou Sale Mounds (16TR189).

Remote-Sensing Survey

Analysis and Interpretation of Remote-Sensing Data

Overall, the data collected during the survey of the five areas was of very good quality. The side scan sonar records provided a clear picture of the bottom in all of the areas. In terms of cultural resources, interpretation of side scan sonar records is straight forward, in the sense that, generally, dense objects (such as metal or wood) are good reflectors and produce a darker image on the record that contrasts with the return from the bottom (Fish and Carr 1990). Garrison et al. (1989:223) note that side scan sonar images of shipwrecks tend to be geometrically complex, exhibit scouring, and are associated with magnetic anomalies, while isolated pieces of modern debris tend to produce geometrically simple images. For example, targets such as isolated sections of pipe or lengths of cable can normally be easily identified and eliminated as possibly significant resources.

The fathometer was used principally to obtain information on water depths. However, it can also be useful in determining if an object such as a wreck, projects above the bottom.

Although a considerable body of magnetic signature data for shipwrecks is now available, it is impossible to positively associate any specific signature with a shipwreck. The variations in the iron content, condition, and distribution of a wreck all influence the intensity and configuration of the magnetic signature produced. In addition, the manner in which the magnetic data are collected affect the characteristics of the signature. Despite these problems, watercraft remains do tend to exhibit characteristic magnetic signatures that often aid in differentiating them from other types of anomalies. When magnetic data are used in conjunction with other data (historic accounts, use patterns of the area, diver inspection), other remote-sensing technologies, and prior knowledge of similar targets, it can often lead to a reasonable estimation of identity.

Traditionally, archaeologists have argued that historic shipwrecks will most commonly produce a magnetic signature composed of a cluster of multiple anomalies (both dipoles [i.e., pairs of magnetic highs and lows] and monopoles [i.e., a single magnetic high or low]) normally with differing amplitudes (see Garrison et al. 1989; Irion et al. 1995; Pearson et al. 1991). Often referred to as a "complex" magnetic signature, this characteristic was recognized in the 1960s by Clausen (1966) and Clausen and Arnold (1975:129) who noted that the wrecks of sailing vessels in Florida and Texas produced magnetic signatures with "a central area of magnetic distortion characterized by a number of intense and generally localized anomalies surrounded. . . [or] interspersed by scattered, smaller magnetic disturbances." Others (e.g., Watts 1980, 1983), however, have demonstrated that a shipwreck can generate much less complex magnetic signatures, sometimes simply a broad-based anomaly of less than 25 gammas. This does occur but the distance of the sensor from the source object is a major influence on the complexity of the signature. The farther away the sensor is, the less likely the anomaly will be "complex" because the sensor is reading the wreck as a single large object and does not discern individual and possibly dispersed elements of a wreck.

Recently, Gearhart (2004), relying on an assessment of 12 shipwreck magnetic anomalies, has argued that the typical magnetic signature produced by an historic shipwreck will be a simple dipole whose polar axis (declination) is aligned nearly parallel with the earth's magnetic axis. In northern magnetic latitudes, the negative portion of each shipwreck anomaly will be located toward magnetic north and the positive pole will be located toward the magnetic South Pole. In addition, the declinations or orientation of the long axes of these dipoles will vary less than 31 degrees from magnetic north. Gearhart (2004) has argued that this observation on declination is useful for distinguishing between shipwrecks and modern debris because the declinations of the magnetic signature of debris tend to follow the orientations of the debris; thus, debris anomalies might be aligned along any azimuth.

As discussed earlier, it was anticipated that the types of historic vessels most likely to have been lost in the areas surveyed would be small to modest sized craft such as bateaus, luggers and skiffs, or more modern fishing vessels and commercial craft such as shrimp boats or barges. The field surveys were designed with the presumption that wrecks in the project area could exist either as scattered remains or as relatively intact vessels with minimal dispersal. Data interpretation relied on the same presumption. The strength, size and configuration of the magnetic signature of any vessel depends principally upon the amount and spatial distribution and orientation of ferrous material it contains. Pearson et al. (1991:70) argued that the magnetic signatures of watercraft of even modest size would range from moderate to high intensity (greater than 50 gammas) when the magnetometer sensor is at a distance of 20 ft or so. Additionally, wrecks of these moderate-sized vessels tend to produce signatures that are greater than 80 or 90 ft across the smallest dimension. Smaller vessels, such as those that might exist within the project areas, will produce magnetic signatures that are less intense and that cover a smaller area. While recognizing that a considerable amount of variability does occur, Pearson et al. (1991) suggested that this information establishes a beginning point for the identification of the sources of the magnetic anomalies.

More recent assessments of objects and vessels (mostly steamboats) discovered in western rivers suggest that the magnetic signatures of sunken vessels tend to be more intense and larger than Pearson et al. (1991) had proposed. This recent work suggests that the magnetic signatures of historic steamboat wrecks typically have a magnetic deviation of at least 500 gammas and a duration (dimension) of no less than 110 ft, usually in the 200-plus foot range (James et al. 1999:7; James and Krivor 2000:16-17). It is recognized, of course, that a variety of post-wreck event factors (i.e., environmental impacts, salvage efforts, channel improvements, etc.) will effect the magnetic signature of any individual wreck. As discussed previously, the most common types of historic watercraft traveling the waters of Cat Island Pass, Terrebonne Bay and Bayou Grand Caillou tended to be small vessels, with locally built vernacular craft probably representing a common class. In general, these boats contained considerably less magnetic material (i.e. iron) than did vessels such as steamboats upon which most calculations of magnetic signature characteristics have relied. While recognizing that a considerable amount of variability can occur, magnetic anomaly signatures that were less than 50 gammas in strength and less than 50 ft across were eliminated from consideration as possible wrecks unless other factors (e.g., side scan sonar images) suggested

otherwise. These relatively low thresholds are considered appropriate considering that small watercraft, with little in the way of magnetic materials, are types that could have been lost in any of the areas surveyed.

Results of the Remote-Sensing Survey

Offshore Survey Area 1 (SPD MI. - 1.7)

Offshore Survey Area 1 is located in the Gulf of Mexico on the west side of the Cat Island entrance channel. This area is located at approximately Mile -1.7 along the Houma Navigation Canal and is the northernmost of the two offshore areas surveyed. Each of the offshore areas measures 800 ft square and encompasses 14.7 acres. Offshore Survey Area 1 was surveyed along 17 parallel track lines spaced 50 ft apart and oriented in a northwest-southeast direction. The survey lines were run in this direction to obtain as smooth a record as possible by alleviating the effects of onshore waves that were running in a generally northerly direction. Lines were extended 100 ft beyond the boundaries of each area to insure full coverage. Figure 40 shows the survey lines as they were actually run ("postplot") overlaid on the lines as designed for the survey ("preplot"). Although it appears as if some of the postplot lines are short at one end, this is simply a reflection of the mapping program printing the plot starting at the first positioning point on a line. The survey instruments were already collecting data by the time this first point was recorded. This phenomenon is also seen on similar maps for the other areas surveyed. The 17 survey lines run in this area constitute approximately 3.1 linear miles of survey and the area examined by remote-sensing instruments encompassed approximately 20.7 acres.

Figure 41 provides information on the bathymetry of Offshore Survey Area 1. As can be seen, water depths ranged from a low of about 11.5 ft in the southwestern corner of the area to a high of just over 14.5 ft along the northeastern edge. It is presumed that this rather significant elevation difference is related to the deposition at this location of spoil derived from past dredging of the HNC entrance channel.

Figure 42 presents the results of the magnetometer survey of Offshore Survey Area 1. The data are contoured at a 10-gamma contour interval. As can be seen, two magnetic anomalies are identified in the data. One, designated Anomaly M001, is a large magnetic signature that occupies almost one quarter of the area. As shown in Table 9, this anomaly displayed a total magnetic deviation of 3700 gammas and covered an area approximately 550 ft across. In addition, this anomaly exhibited multiple high and low magnetic peaks and can be classified as a "complex" magnetic signature. No objects were seen at this location on side-scan sonar records suggesting that the source object, or objects, for this large magnetic anomaly are buried.

In light of the above discussions on the characteristics of known historic shipwreck anomalies, Anomaly M001 certainly fits the magnetic characteristics of historic shipwrecks. However, in the present instance there are good reasons for believing that this anomaly is not related to an historic shipwreck. The most obvious reason is that the anomaly falls within an area where dredge spoil has been deposited. Thus, the source object could very well

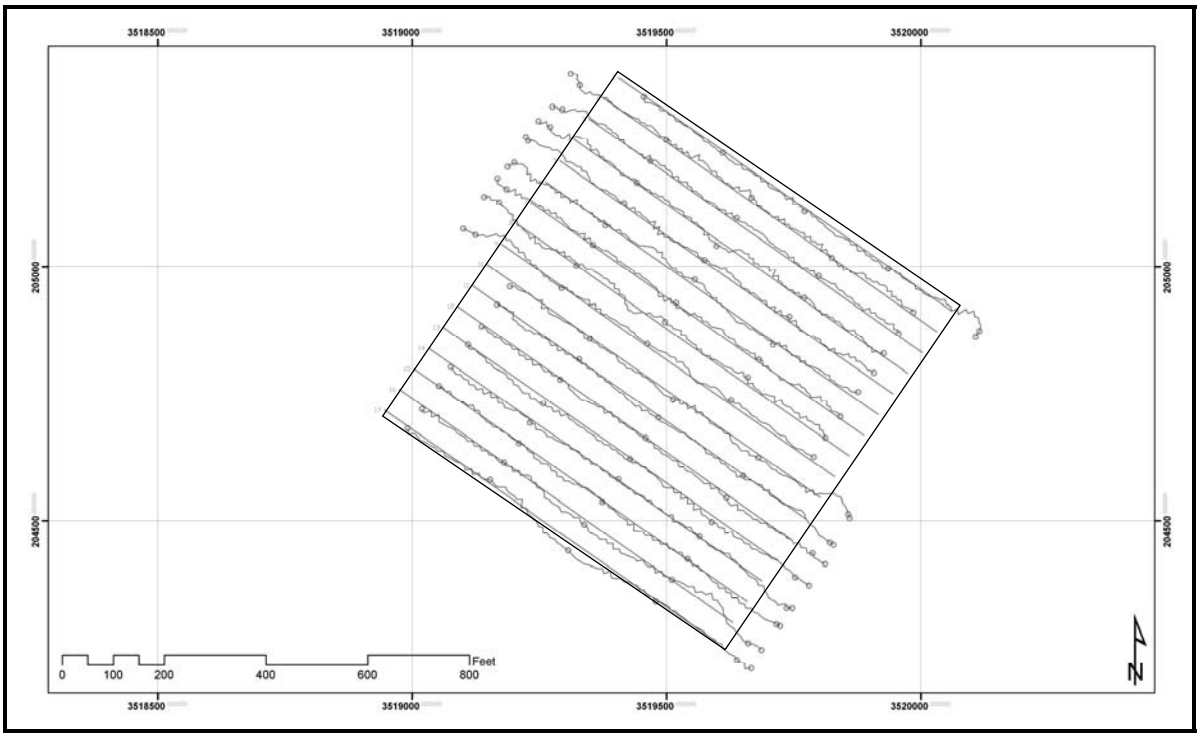

Figure 40. The postplot of survey lines as they were run overlaid on the survey lines as designed for Offshore Survey Area 1. Coordinates are Louisiana South State Plane, NAD83.

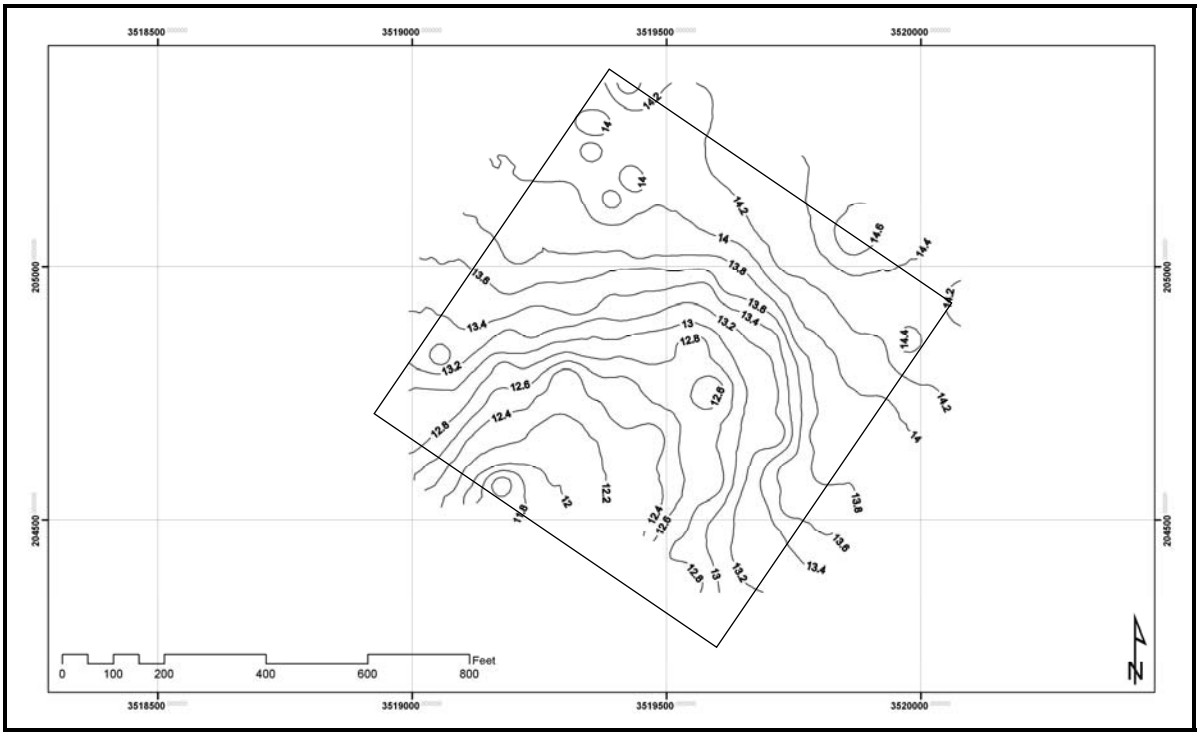

Figure 41. Bathymetry in Offshore Survey Area 1. Coordinates are Louisiana South State Plane, NAD83.

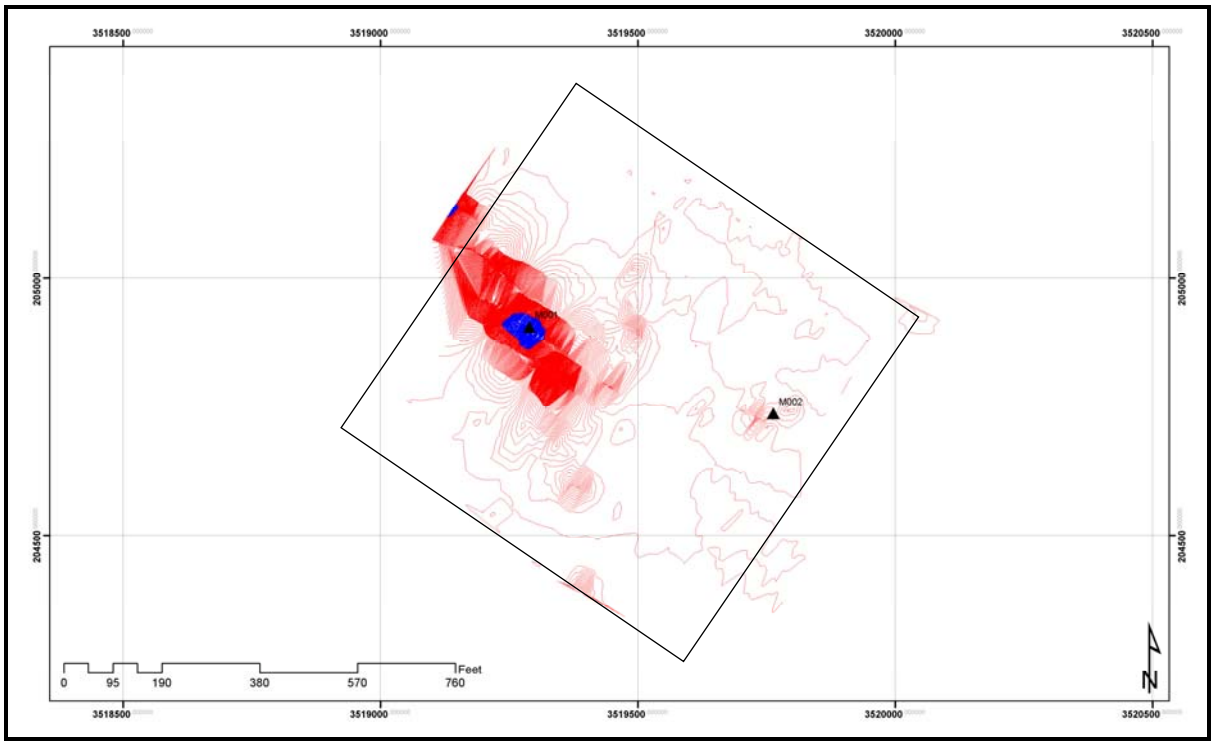

Figure 42. Magnetic contour map of Offshore Survey Area 1. Contour interval is 10 gammas. Red contours represent magnetic highs and blue contours represent magnetic lows relative to the background magnetic gradient. See Table 9 for information on each anomaly.

Table 9. Magnetic Anomalies of Interest Recorded Within the Terrebonne Bay and Offshore Survey Areas.

Anomaly	Easting	Northing	Deviation	Duration (ft)	Type	Area
M001	3519289	204906	+981 / -2719	550	CD	Offshore 1
M002	3519763	204737	+57 / -50	150	CD	Offshore 1
M003	3520778	201806	+120 / - 817	366	CD	Offshore 2
M004	3520664	202315	+300 / -3290	448	CD	Offshore 2
M005	3486526	206480	+ 100 / - 60	130	CD	Dernieres
M006	3489669	207101	+ 60 / - 225	80	CD	Dernieres
M007	3494293	207708	+ 524 / - 84	292	CD	Dernieres
M008	3536483	215312	+ 240 / - 280	300	CD	Timbalier
M009	3537349	215557	+310 / -280	475	CD	Timbalier

C = complex, M = monopole, D = dipole

represent items associated with dredging such as pipe or wire cable, or it might represent modern trash and debris that was removed from the HNC and deposited at this location. Several previous magnetometer surveys have demonstrated that heavily traveled commercial channels typically exhibit numerous magnetic anomalies derived from trash and debris that have been accidentally lost, or purposefully thrown or dumped from passing vessels (see James and Pearson 1991; Pearson and Hudson 1990). Inevitably, during dredging, some of this material will be removed and deposited at spoil deposition locations.

In addition, as seen in Figure 42, Anomaly M001 continues beyond the project area in a northwesterly direction. How far this anomaly might extend in this direction is unknown, but the signature displays a linear orientation suggestive of a long piece of pipe. Further, this signature resembles magnetic signatures recorded along the Cat Island Pass Entrance Channel in 1998 (Birchett and Pearson 1998). During that study, two large, complex magnetic anomalies, Designated Target 1 and Target 2, were recorded along the western edge of the navigation channel less than 2100 ft south of Anomaly M001 discovered in the present study. Diver examination and probing at the Target 1 location was unable to discover the source object and it was determined that it probably consisted of a scatter of modern debris or a piece of steel or iron cable. Probing at Target 2 did locate an object buried about 3 ft below the bottom that was tentatively identified as a piece of cement-encased pipe measuring about 2.5 ft in diameter and at least 12 ft long (Birchett and Pearson 1998:40-43). In light of the findings of the 1998 study, it is believed that the source for Anomaly M001 is a scatter of buried modern debris or, possibly more likely, a piece of buried pipe. The source object for Anomaly M002 is also considered to be a piece of modern debris probably derived from dredge spoil dumped in this area in the past.

Offshore Survey Area 2 (SPD MI. – 2.5)

Offshore Survey Area 2, the southernmost of the two offshore areas examined, is located in the Gulf of Mexico on the west side of the Cat Island entrance channel at about Mile -2.5 on the Houma Navigation Canal. As with Offshore Survey Area 1, this area Measured 800 ft square and encompasses 14.7 acres. Offshore Survey Area 2 was surveyed along 17 parallel track lines spaced 50 ft apart and oriented in a northwest-southeast direction (Figure 43). The survey lines were run in this direction to obtain as smooth a record as possible by alleviating the effects of onshore waves that were running in a generally northerly direction. Lines were extended 100 ft beyond the boundaries of each area to insure full coverage. The 17 survey lines run in this area constitute approximately 3.1 linear miles of survey and the area examined by remote-sensing instruments encompassed approximately 20.7 acres.

Figure 44 provides information on the bathymetry of Offshore Survey Area 2. As can be seen, water depths ranged from a low of about 8 ft in the western portion of the area to a high of just over 13 ft along the eastern edge. As with Offshore Survey Area 1, it is presumed that this considerable elevation difference is related to the deposition of spoil at this location in the past.

Figure 45 presents the results of the magnetometer survey of Offshore Survey Area 2. The data are contoured at a 10-gamma contour interval. As can be seen, two magnetic anomalies are identified in the data. One, designated Anomaly M003, is a large “complex” magnetic signature that exhibits a total magnetic deviation of over 900 gammas and covered an area approximately 370 ft across (see Table 9). The other anomaly, designated Anomaly M004, produced a deflection of 3590 gammas and covered an area measuring 448 ft across (see Table 9). However, as seen in Figure 6-8, the source(s) for this anomaly apparently extends northward beyond the bounds of the survey area. No objects were seen on side scan

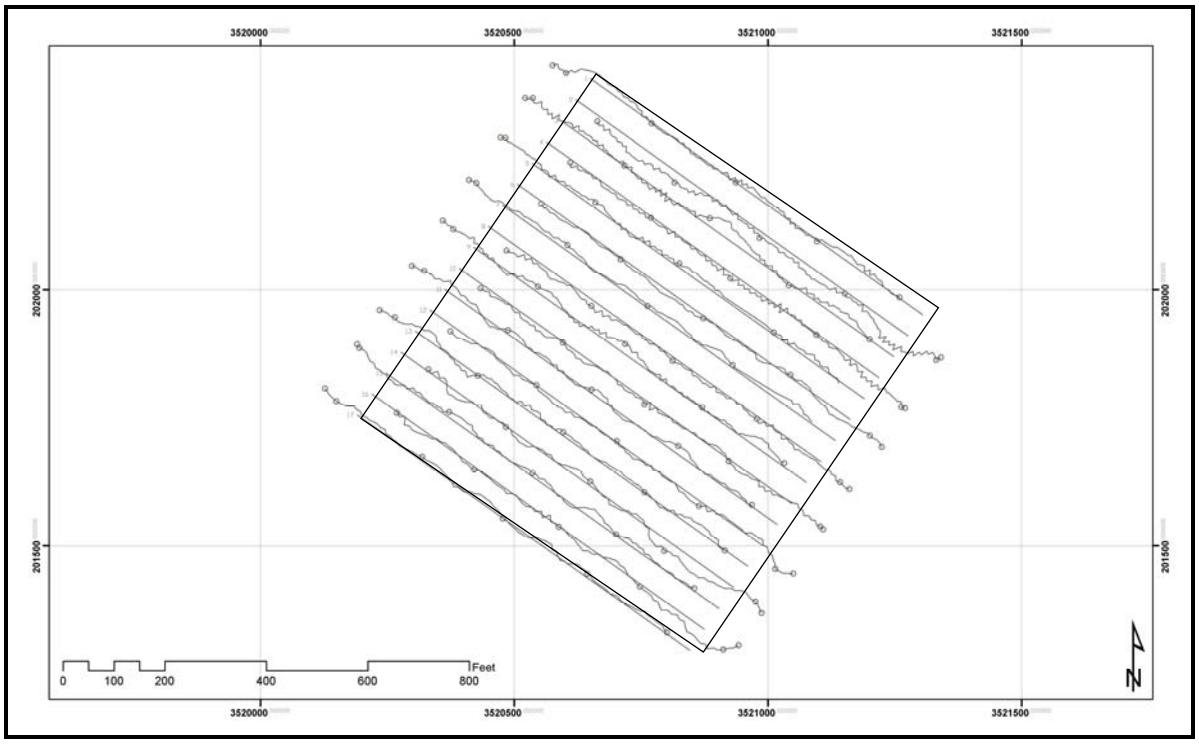

Figure 43. The postplot of survey lines as they were run overlaid on the survey lines as designed for Offshore Survey Area 2. Coordinates are Louisiana South State Plane, NAD83.

Figure 44. Bathymetry in Offshore Survey Area 2. Coordinates are Louisiana South State Plane, NAD83.

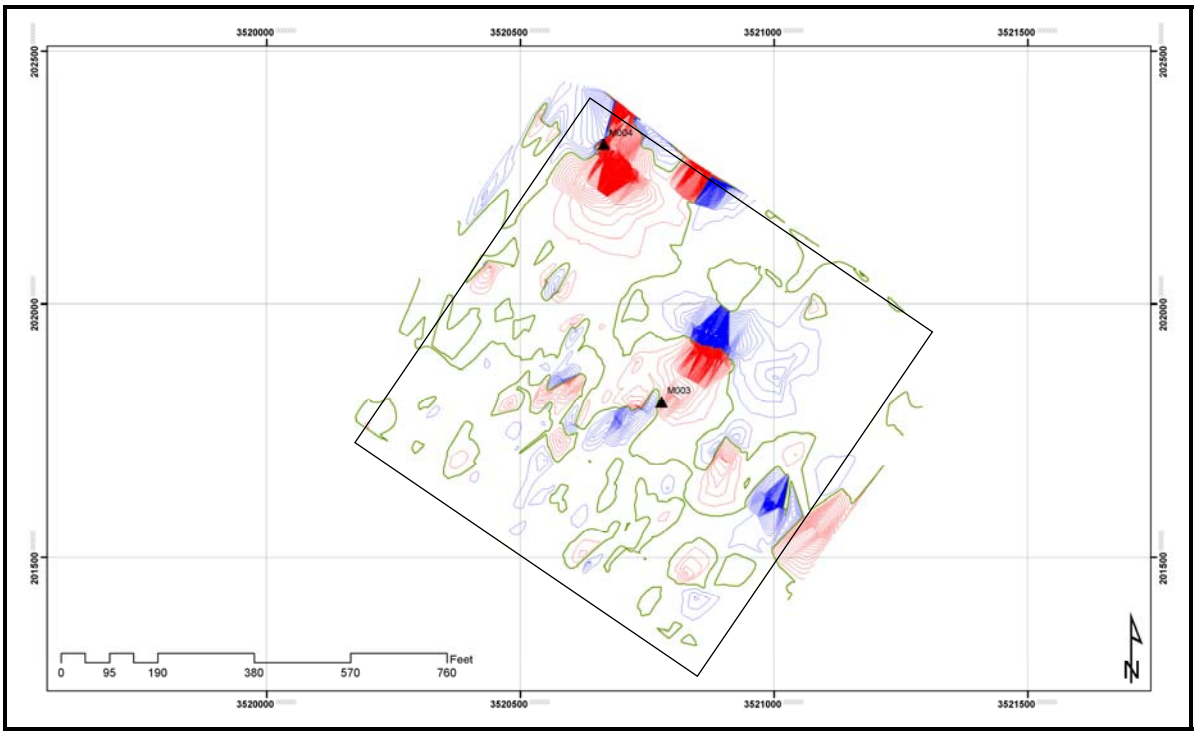

Figure 45. Magnetic contour map of Offshore Survey Area 2. Contour interval is 10 gammas. Red contours represent magnetic highs and blue contours represent magnetic lows relative to the background magnetic gradient. See Table 9 for information on each anomaly.

records collected in Offshore Survey Area 2 suggesting that the source objects for both of these anomalies are buried.

As with Offshore Survey Area 1, it is believed that the magnetics recorded in this area are most likely related to modern trash and debris that has been deposited in this area with spoil removed from the Cat Island Pass navigation channel during past episodes of dredging. In fact, as discussed previously, two pieces of dredge pipe were removed from a location immediately adjacent to Offshore Survey Area 2 as part of the Louisiana Underwater Obstruction Removal Program. It is considered very likely that the large magnetic anomalies recorded within this survey area represent similar pieces of pipe or other materials related to dredging. Neither Anomaly M003 nor M004 are believed to represent significant cultural properties.

Isle Derniere Survey Area

The Isle Derniere Survey area is a large, irregularly shaped area located on the north, or bay side of the extreme eastern end of Isle Derniere. This area measures about 15,200 ft long and 3500 ft wide at its greatest dimensions and encloses approximately 922 acres. Figure 46 shows the survey lines actually run overlaid on the pre-plotted survey design. As can be seen, much of the southern portion of the area, which is adjacent to the island, could not be surveyed because the water was too shallow. The survey boat was run as close to the island as possible, but generally it could not be operated in waters less than about 2.5 ft deep. A particularly large area of shallow water exists in the southwestern corner of the survey area

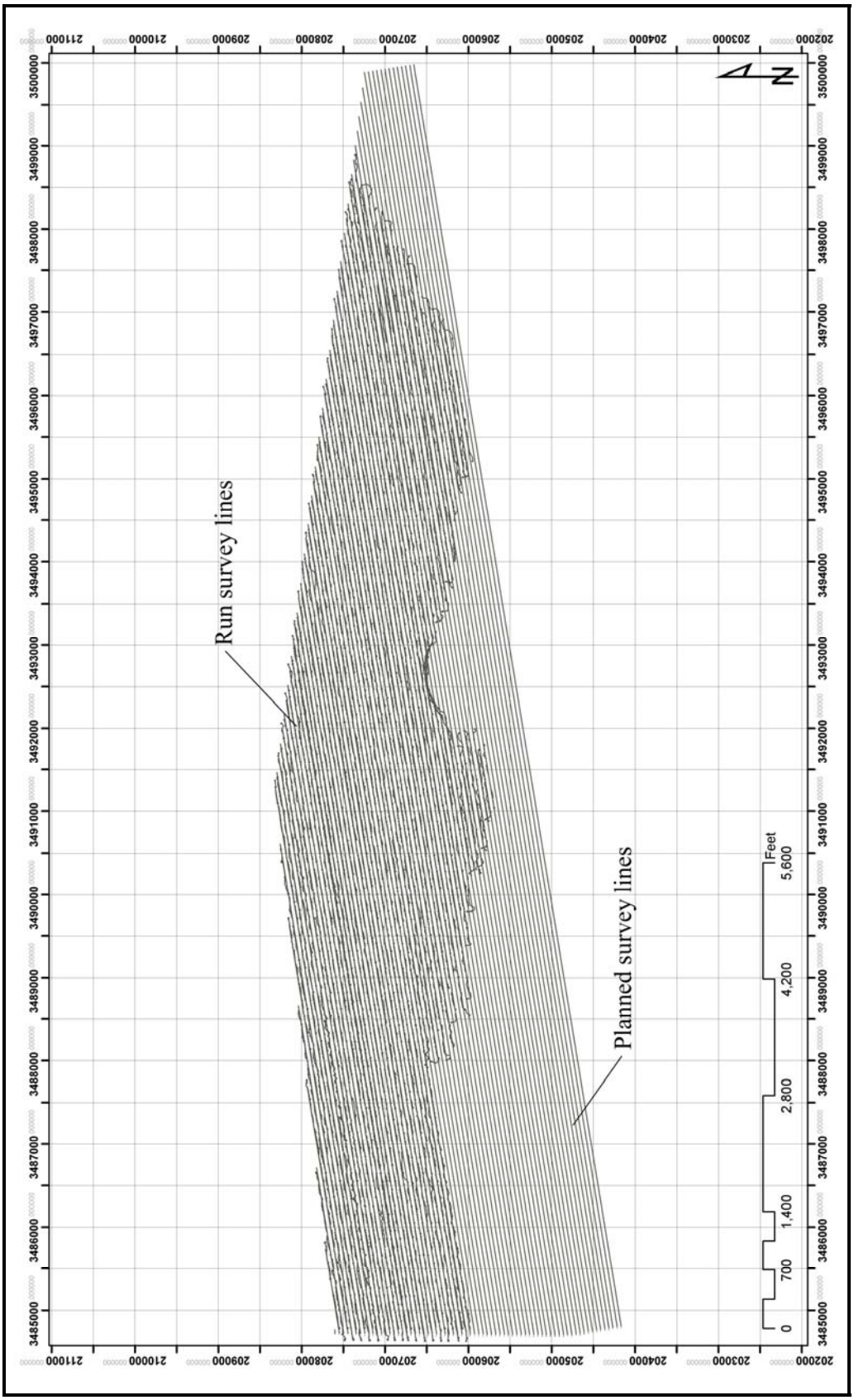

Figure 46. The postplot of survey lines as they were run overlaid on the survey lines as designed for the Isle Derniere Survey Area. Coordinates are Louisiana South State Plane, NAD83.

preventing any examination of this area. Ultimately, 66 survey lines spaced 50 ft apart were run parallel to the long axis of the area. These track lines ranged from 790 ft to 11,300 ft long and represented about 90 linear miles of survey that encompassed an area of approximately 635 acres, representing 68.9 percent of the total project area.

Figure 47 provides information on the bathymetry of the Isle Derniere Survey Area. The shallowness of the water along the southern portion of the survey area is obvious in this figure. In the eastern half of the area surveyed, the bottom drops off relatively quickly along the southern edge from a depth of about 3 ft to about 7 ft. The water deepens more gradually in the western half of the area. The water reaches a maximum depth of about 9 ft along the northern edge of the survey area.

Figure 48 presents the results of the magnetometer survey of the Isle Derniere Survey Area. The data are contoured at a 10-gamma contour interval. The most obvious features seen are several linear magnetic anomalies that display the classic signatures of pipelines. Five pipelines can be discerned in the data. Two extend north from Isles Derniere and two run in a roughly east-west direction and converge near the center of the survey area. Another pipeline extends north and out of the survey area from this convergence. Several small magnetic anomalies are scattered around the survey area and these are presumed to represent modern trash or debris, some no doubt derived from the extensive amount of oil and gas activity occurring in the area.

Three anomalies in this area displayed some of the characteristics of known shipwreck magnetic signatures and are identified as Anomalies M005, M006 and M007 (see Table 9, Figure 48). Anomaly M007, located at the eastern end of one of the pipelines, appeared to be related to the pipeline. To ascertain if this anomaly, as well as all of the others identified during the survey, might be associated with a known oil or gas well, the locations of recorded anomalies was compared against GIS information on recorded wells and other oil and gas drilling/production features provided by the Louisiana Department of Natural Resources. This information exists as an online database known as SONRIS and is current through 2007 (Louisiana Department of Natural Resources 2007). The positions of all of the magnetic anomalies recorded in the Isle Derniere Survey Area were compared against data contained in SONRIS and it was found that Anomaly M007 corresponds to an oil/gas well designated VUQ;LPU 17, Number 003 (Figure 49). Anomalies M005 and M006 display moderately strong magnetic deflections, 160 and 285 gammas respectively, but each covers a relatively small area. The side scan sonar imagery showed no objects on the bay floor at the locations of these two anomalies suggesting the source objects are buried. The locations of neither of these anomalies correlated with features listed in the SONRIS system, but given the intensive amount of oil and gas activity in the area, as clearly demonstrated in Figure 49, it is suspected that these anomalies are related to features or debris associated with those activities. No objects or features believed to represent significant cultural remains were identified in the Isle Derniere Survey Area.

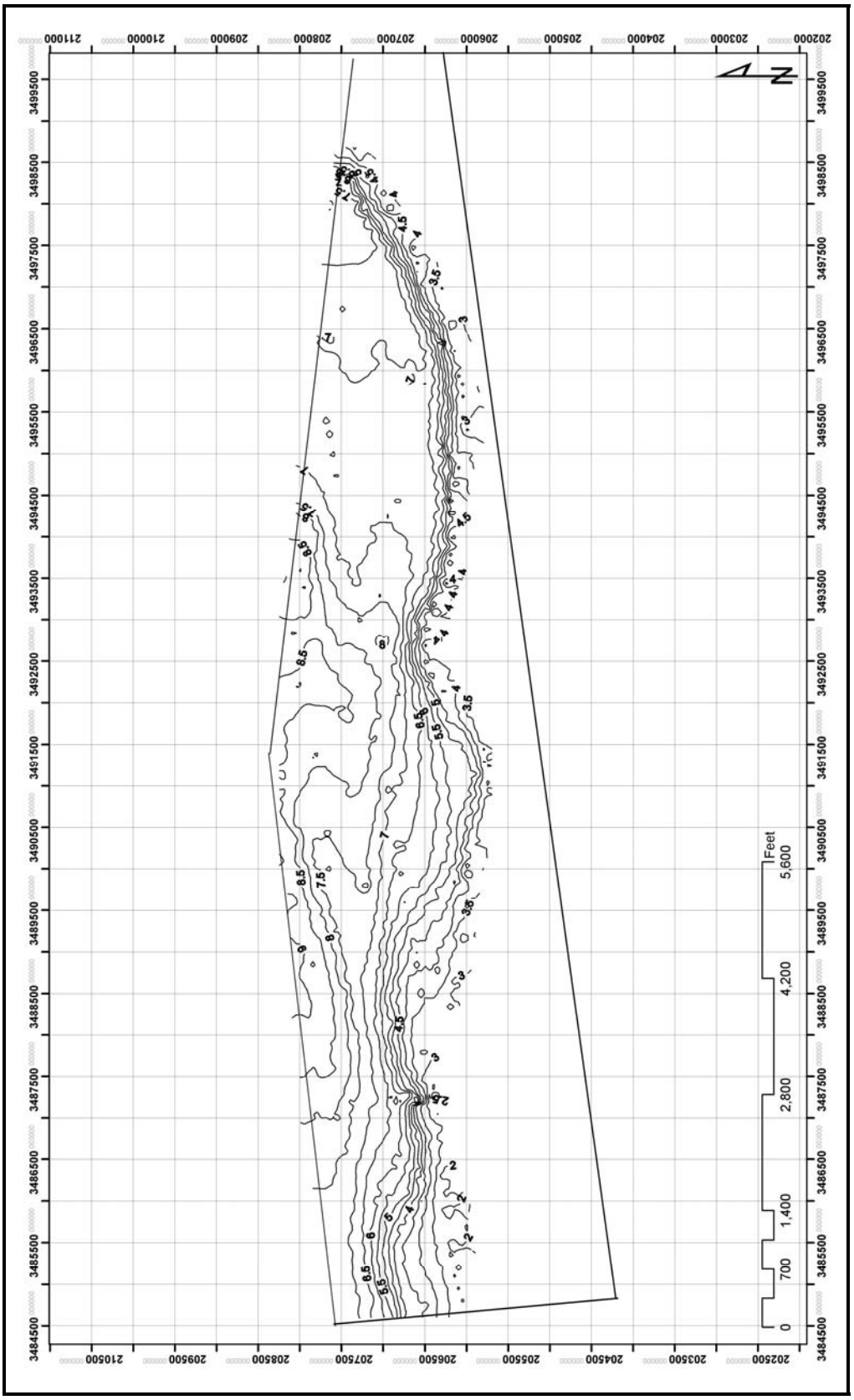

Figure 47. Bathymetry in the Isle Derniere Survey Area. Contour interval is 0.5 feet.

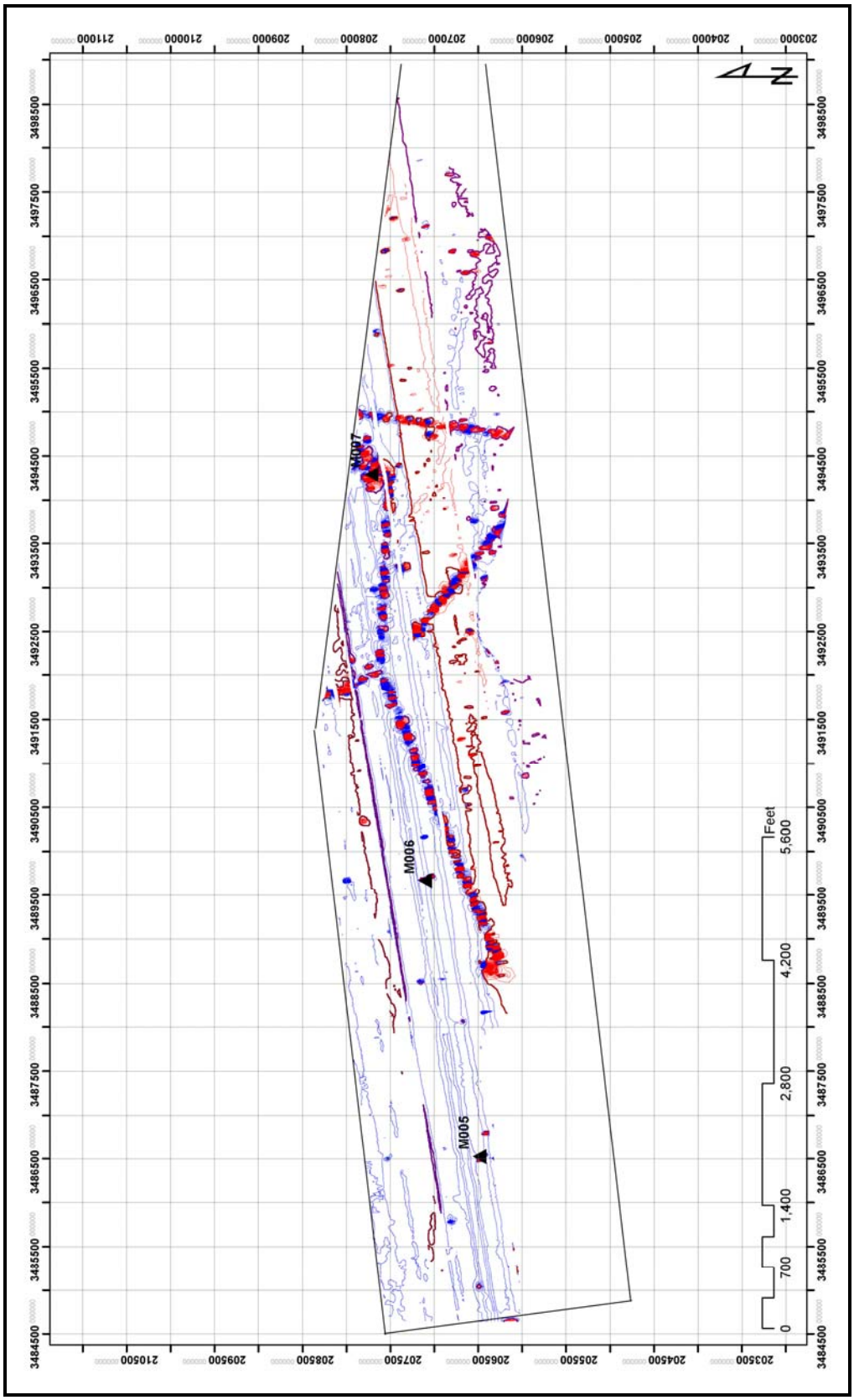

Figure 48. Magnetic contour map of the Isle Derniere survey Area. Contour interval is 10 gammas. Red contours represent magnetic highs and blue contours represent magnetic lows relative to the background magnetic gradient. See Table 9 for information on each anomaly.

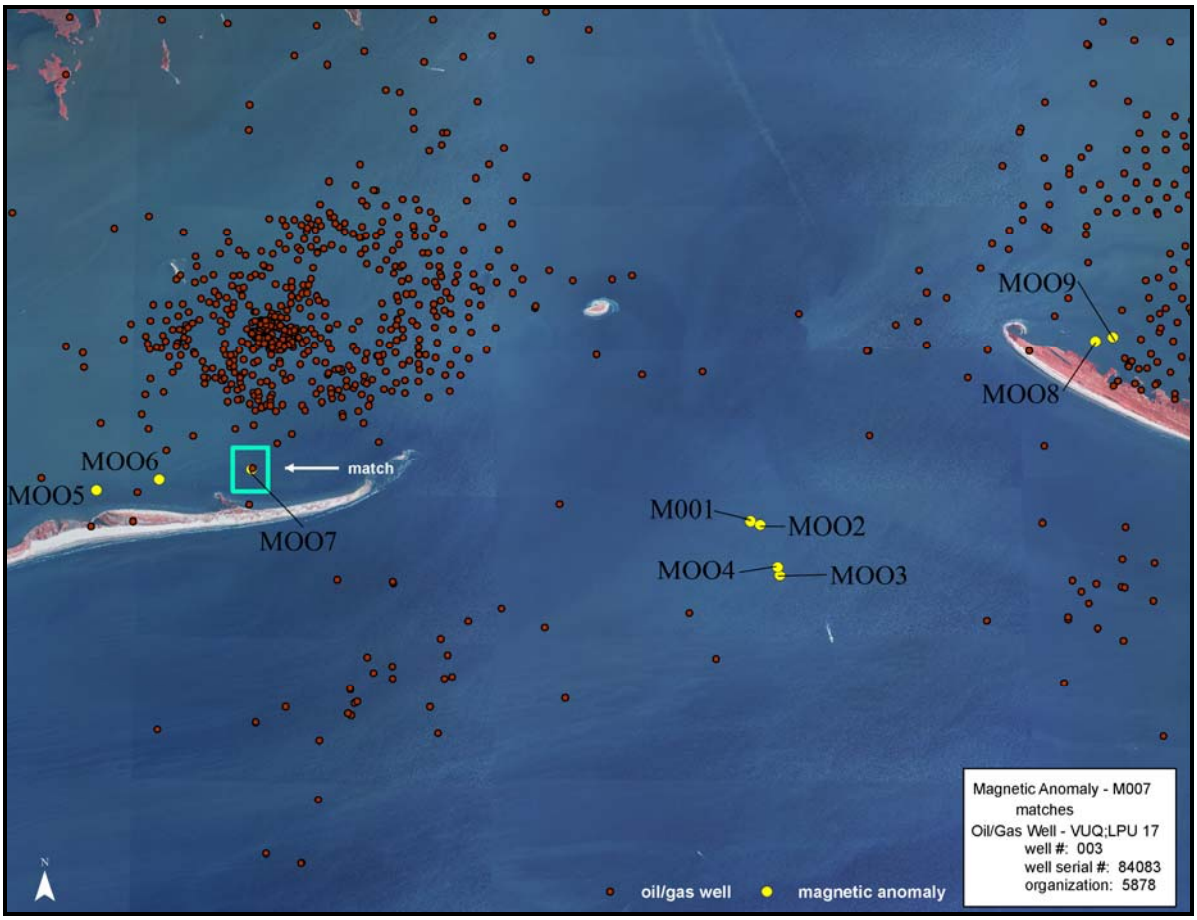

Figure 49. **The positions of the nine magnetic anomalies (yellow) recorded in the offshore and Terrebonne Bay survey areas in conjunction with reported oil and gas wells (red) listed in the SONRIS database. This figure displays the extremely large number of oil and gas industry features in the area (SONRIS data from Louisiana Department of Natural Resources 2007).**

Timbalier Island Survey Area

The Timbalier Island Survey Area is a large polygon located on the north, or bay side, of the extreme western end of Timbalier Island. This survey area is located within what was once Caillou Pass that served as a navigation route between Timbalier Bay and Cat Island Pass. Caillou Island, once a fairly substantial land mass marking the northern boundary of the pass, has entirely disappeared in the past 25 years (Google Earth 2008; U.S. Army Corps of Engineers 2007). This survey area measures about 13,390 ft long and 2150 ft wide at its greatest dimensions and encompasses approximately 541 acres. Figure 50 shows the survey lines actually run overlaid on the pre-plotted survey design. As with the Isle Derniere Survey Area, much of the southern portion of the area, which is adjacent to Timbalier Island, could not be surveyed because the water was too shallow. In addition, a large above-water structure consisting of a series of interconnected oil/gas wells is located near the western end of the survey area and prohibited survey there. Ultimately, a total of 31 survey lines spaced 50 ft apart were run parallel to the long axis of the area. These track lines ranged from 1480

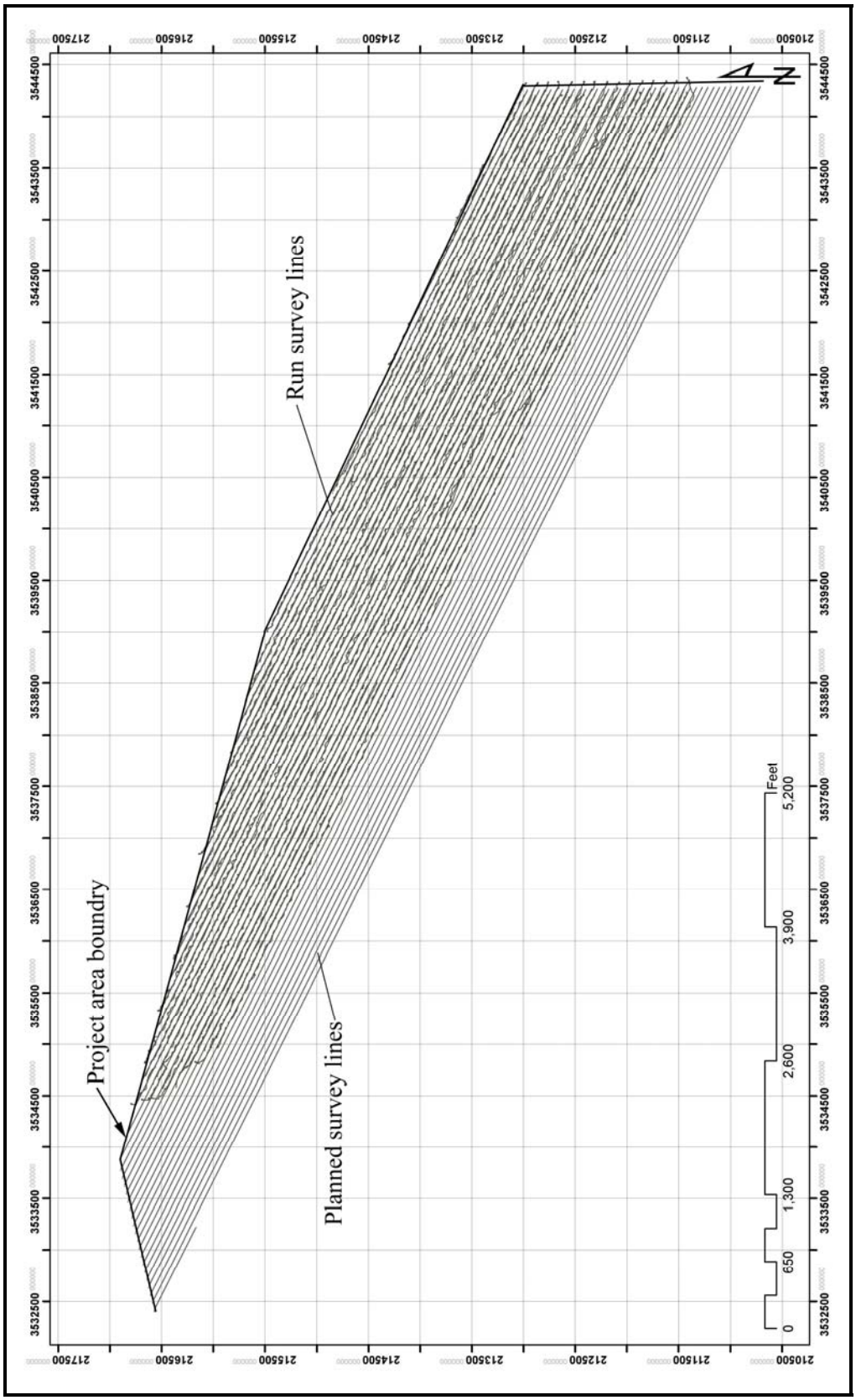

Figure 50. The postplot of survey lines as they were run overlaid on the survey lines as designed for the Timbalier Island Survey Area. Coordinates are Louisiana South State Plane, NAD83.

ft to 11,000 ft long and represented approximately 60 linear miles of survey that encompassed an area of 325 acres, constituting 60 percent of the total project area.

Figure 51 provides information on the bathymetry of the Timbalier Island Area. As can be seen in this figure, an error in data collection eliminated a few lines of bathymetric data along the northern edge of the survey area. The missing data, however, do not obscure the obvious shallow water throughout the survey area. In the area that could be covered by survey, water depths ranged from 2.5 ft to just over 4 ft.

Figure 52 presents the results of the magnetometer survey of the Timbalier Island Survey Area. The data are contoured at a 10-gamma contour interval. As can be seen, a very large number of pipelines crisscross the entire survey area. Thirty-two distinct pipelines were identified in the magnetometer data, but in the central portion of the survey area, the magnetic signatures are so overlapping that some pipelines may have been missed. The presence of pipelines was expected given that several oil and gas wells and other related structures were observed in the survey area (Figure 53). The concentration of wells and pipelines in this area is related to the presence of the Caillou Island Salt Dome located beneath Terrebonne Bay immediately north and northeast of the survey area.

For most of the Timbalier Island Survey Area, the magnetic signatures of the numerous pipelines will have essentially "masked" the signatures produced by any sunken vessels that might exist. Thus, reliance has been placed principally on side-scan sonar records in the identification of much of the area. However, these records showed no features that could be identified as possible boat remains.

Two magnetic anomalies were identified in the Timbalier Island Survey Area that are spatially distinct from the pipeline signatures. These are designated as Anomalies M008 and M009 (see Table 9) and are shown in Figure 52. Both anomalies consist of complex magnetic signatures that displayed deflections greater than 500 gammas and covered areas over 300 ft across. The positions of these anomalies were checked against data presented in the Louisiana Department of Natural Resources SONRIS system of wellheads and other oil and gas industry features. As shown in Figure 49, these anomalies do not correlate with any of the features listed in SONRIS. Even though these signatures match the general characteristics of known historic shipwrecks, and do not correlate specifically with the recorded locations of oil or gas well features, given the extensive amount of oil/gas industry activities in the immediate vicinity, there is a high probability that these anomalies are related to unreported, lost or discarded objects associated with these activities. As noted previously, no objects were seen on side scan records near these anomalies. Thus, these two anomalies are unlikely to represent significant cultural remains. No objects of features believed to represent significant cultural remains were identified in the Timbalier Island Survey Area.

In summary, no historic properties were identified in either the Timbalier Island or Isle Derniere survey areas, so there is no need for the Corps of Engineers to consider any additional efforts related to cultural resources in these areas. However, the Corps does need to take into account the numerous pipelines, wells, abandoned wells and structures found in these two areas during their planned island restoration projects. Engineering planning and

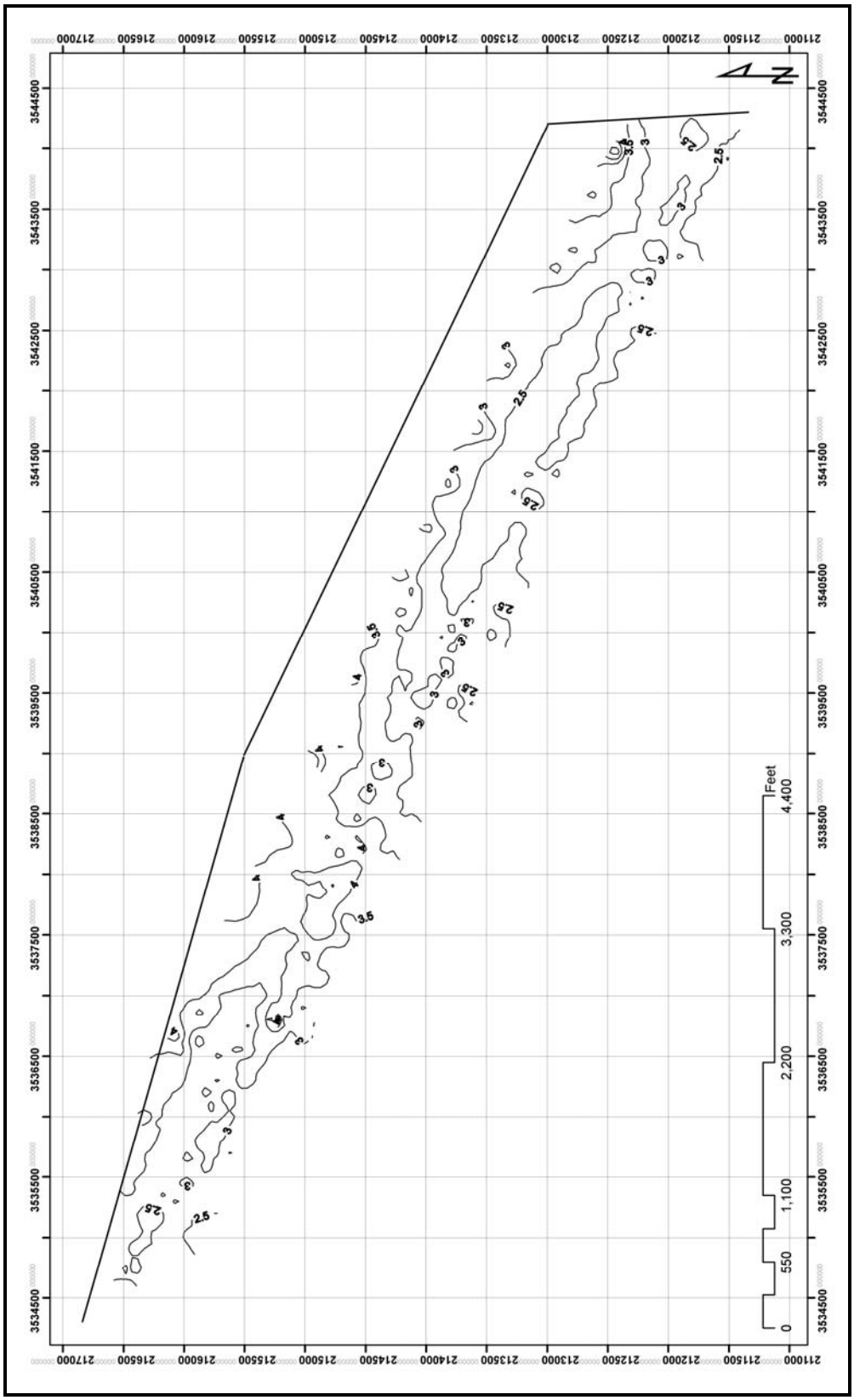

Figure 51. Bathymetry in the Timbalier Island Survey Area. Contour interval is 0.5 feet.

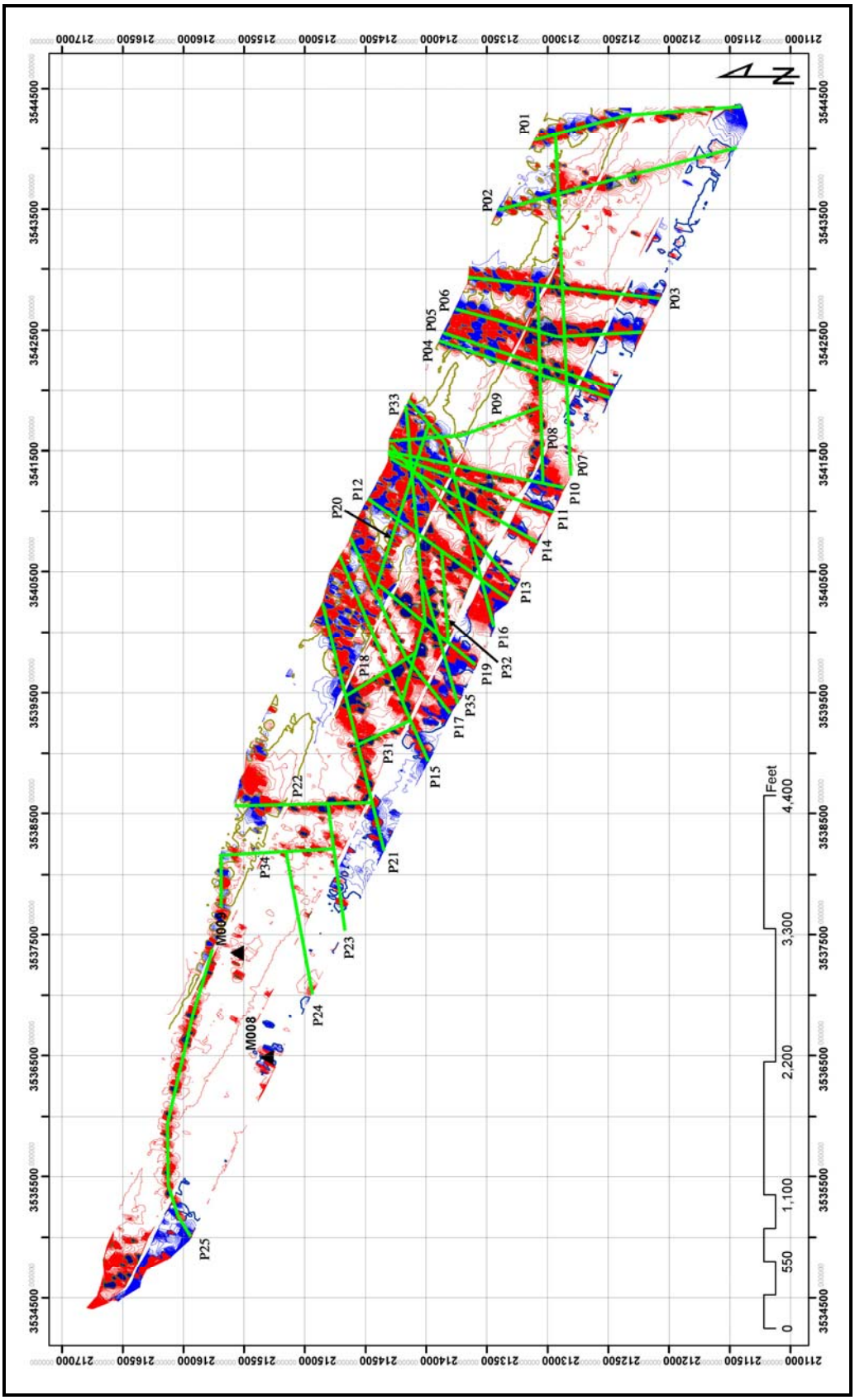

Figure 52. Magnetic contour map of the Timbalier Island Survey Area. Contour interval is 10 gammas. Red contours represent magnetic highs and blue contours represent magnetic lows relative to the background magnetic gradient. See Table 9 for information on each anomaly.

Figure 53. One of the many types of well heads and oil and gas industry features, abandoned or in operation, found throughout both the Timbalier and Isle Derniere survey areas. View is looking south toward the shore of Timbalier Island.

field efforts need to insure that none of these features are damaged or impacted during the restoration process because this could result in serious environmental harm to the Terrebonne Bay area.

Bayou Grand Caillou Survey Area

The area examined by remote-sensing survey along Bayou Grand Caillou began at the intersection of the bayou with the HNC and extended for a distance of 6.41 miles (33,852 ft) down (south) the bayou toward the Gulf of Mexico (Figure 54). The New Orleans District plans to dredge this section of the bayou to deepen it. The plans are to achieve a dredged depth of 12 ft below MSL at the upper end of this stretch of bayou grading to a depth of 10 ft below MSL at the lower end. In addition, the plan is to construct a floodgate structure at the upper end of this portion of the bayou. This structure will be located immediately west of the intersection of the HNC with Bayou Grand Caillou.

As discussed previously, Bayou Grand Caillou has served as a relatively important navigation route from the Gulf of Mexico to the interior of Terrebonne since the earliest days of European settlement. In addition, settlement along the bayou once extended well below

Figure 54. The 6.41-mile-long portion of Bayou Grand Caillou that is to be dredged and was investigated by remote-sensing survey. Base map provided by the New Orleans District, U.S. Army Corps of Engineers.

the present crossing of the HNC. The nature of this settlement is not well known for the nineteenth century because of a lack of detailed maps. However, topographic quadrangles from the twentieth century show settlement existed along the portion of the bayou that was surveyed for this study prior to the construction of the HNC. For example, the 1935 Lake Quitman 7.5 Min quadrangle shows 11 structures on the west bank of Bayou Grand Caillou extending for about one mile below Mound Bayou (Figure 55). By 1944, only eight structures remained in this area and by 1964, after the HNC was constructed, all of these buildings were gone.

It is obvious that the construction of the HNC cut through Bayou Grand Caillou ending any land access to these areas and making water access more difficult resulting in their abandonment. Prior to abandonment, it is presumed that the settlement along the bayou below Mound Bayou included residences as well as docks, just as it presently does above the HNC. It is further assumed that abandoned vessels dating from throughout the period of occupation existed along the bayou in these areas of settlement, just as the New Orleans District has demonstrated for the area along Grand Caillou a short distance to the north (Flayharty and Muller 1983).

In addition to its potential for abandoned historic watercraft, this area along Bayou Grand Caillou was also the location of the small Civil War earthwork known as Fort Quitman constructed by the Confederates in 1861 (see Figure 55). What, if anything, remains of the fortification is unknown as it is not located in the present project area.

The remote sensing survey of the Bayou Grand Caillou area was begun on November 13, 2007 but strong winds forced an end to the survey after just one day. Because of continuing bad weather, the survey crew was forced to abandon the field effort. The crew returned to the field and restarted the survey on December 2. The survey was completed on December 4, 2007. The survey was conducted by a three-person team consisting of Dr. Michael Faught, Jim Duff and Andrew Lydecker of Panamerican Consultants working under the direction of Dr. Charles Pearson of Coastal Environments, Inc. The same remote-sensing equipment and survey boat used for the other survey areas were employed in Bayou Grand Caillou.

The remote-sensing survey of the Bayou Grand Caillou was begun by running a centerline completely down the 6.41-mile-length of the survey area using the starting and end points shown in the dredging plans provided by the New Orleans District and shown as Figure 54. The navigation program Hypack® collected positioning points along this centerline and was then used to produce track lines offset at 50-ft-intervals on either side of the centerline. Seventeen planned track lines were produced, assuming a maximum survey corridor width of about 800 ft. As it turned out, the bayou was too narrow, or the water near the banks was too shallow, to permit more than 16 survey lines to be run along any given section of the survey area. In fact, along most of the bayou it was impossible to run more than 10 survey lines. In total, an estimated 68.32 linear miles of survey were run along Bayou Grand Caillou encompassing approximately 465 acres of water bottom. The speed of the survey vessel was maintained between 3.5 to 4 knots for the uniform acquisition of data.

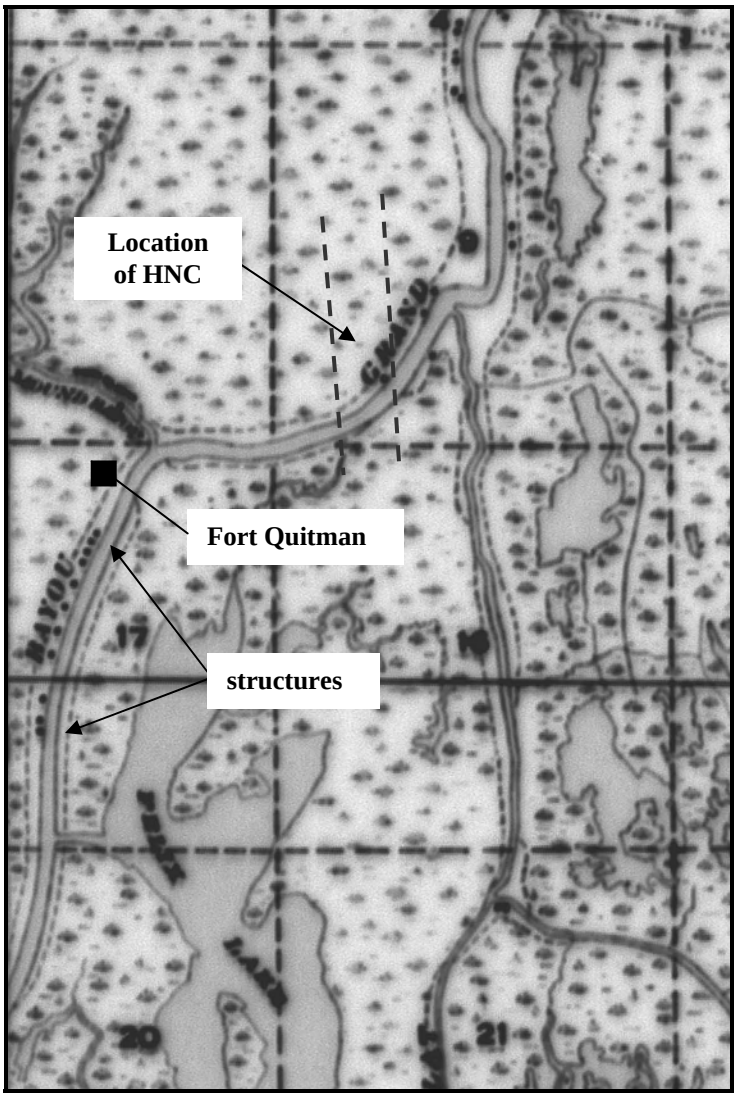

Figure 55. Detail of 1935 Lake Quitman, La. 7.5 Min topographic quadrangle showing settlement along Bayou Grand Caillou in the northern portion of the area examined by remote-sensing survey. The locations of the Civil War Fort Quitman and the present HNC are shown. (Map source: USGS 1935).

Because the Bayou Grand Caillou Survey Area was so long and narrow, it was decided to divide it into three roughly equal sections for survey. This alleviated problems that might be encountered with diurnal variation if the survey was carried along a single line for a very long period of time. The three sections were designated the Northern, Central and Southern sections and each was surveyed separately. The following discussions presents the findings of the remote-sensing survey area by each of these sections.

Northern Section, Bayou Grand Caillou Survey Area

The Northern Section of the Bayou Grand Caillou Survey Area extended south (down the bayou) from the HNC for a distance of 2.25 mi (11895 ft). In the upper portion of this area, above Mound Bayou, it was possible to run nine parallel track lines in the bayou covering a width of about 500 ft. The water was too shallow on either bank to include more survey lines. Below Mound Bayou, it was possible to run only eight parallel track lines due to the shallow water along either bank. Figure 56 shows the survey lines actually run in the Northern Section. Water depths in this section ranged from about 2.5 ft along the banks to a maximum depth of 12.2 ft. Other than shallow water along the bank lines, the only impediment to the survey was vessel traffic, which consisted of boats of varying types, some of which had to be avoided.

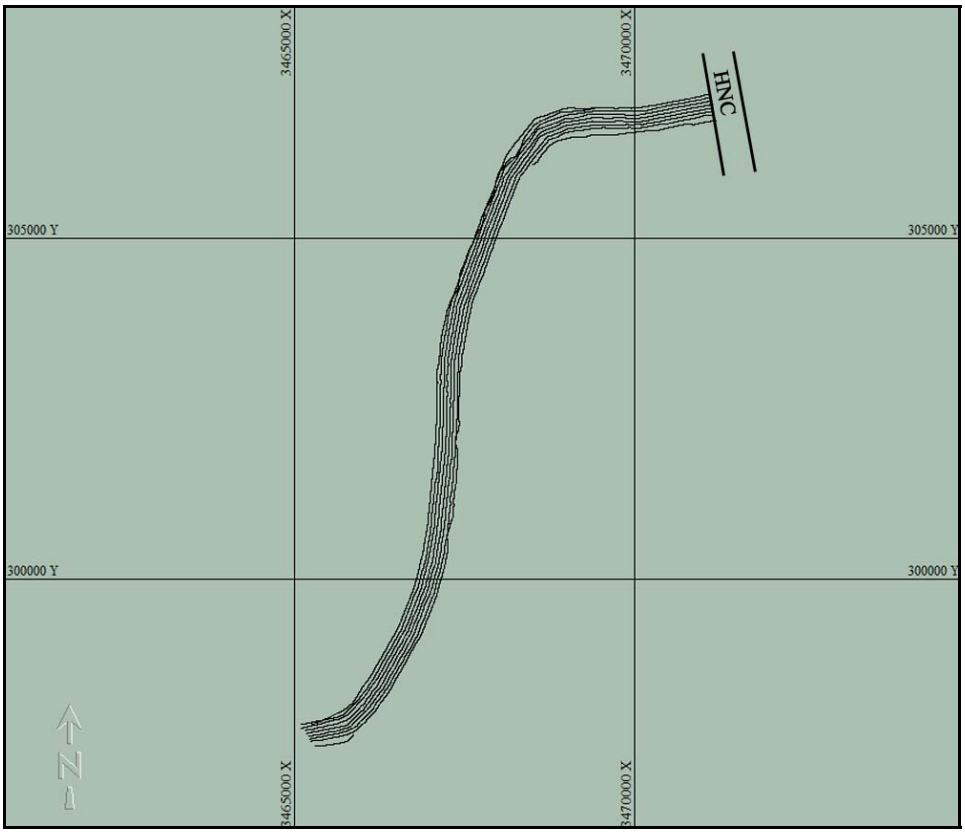

Figure 56. Postplot of survey lines run in the Northern Section of the Bayou Grand Caillou Survey Area. Coordinates are Louisiana South State Plane, NAD83.

Figures 57 and 58 present information on the magnetic data collected in the Northern Section. As can be seen in these figures, dozens of magnetic anomalies were recorded along this section of the bayou. In fact, the findings in the Northern Section were repeated along the entire portion of Bayou Grand Caillou examined where literally hundreds of magnetic anomalies were recorded. All of these anomalies were analyzed on the basis of their magnetic deflection (intensity), duration (in seconds, an expression of size), type (monopole, dipole, multi-component), and association with other magnetic and side scan sonar targets.

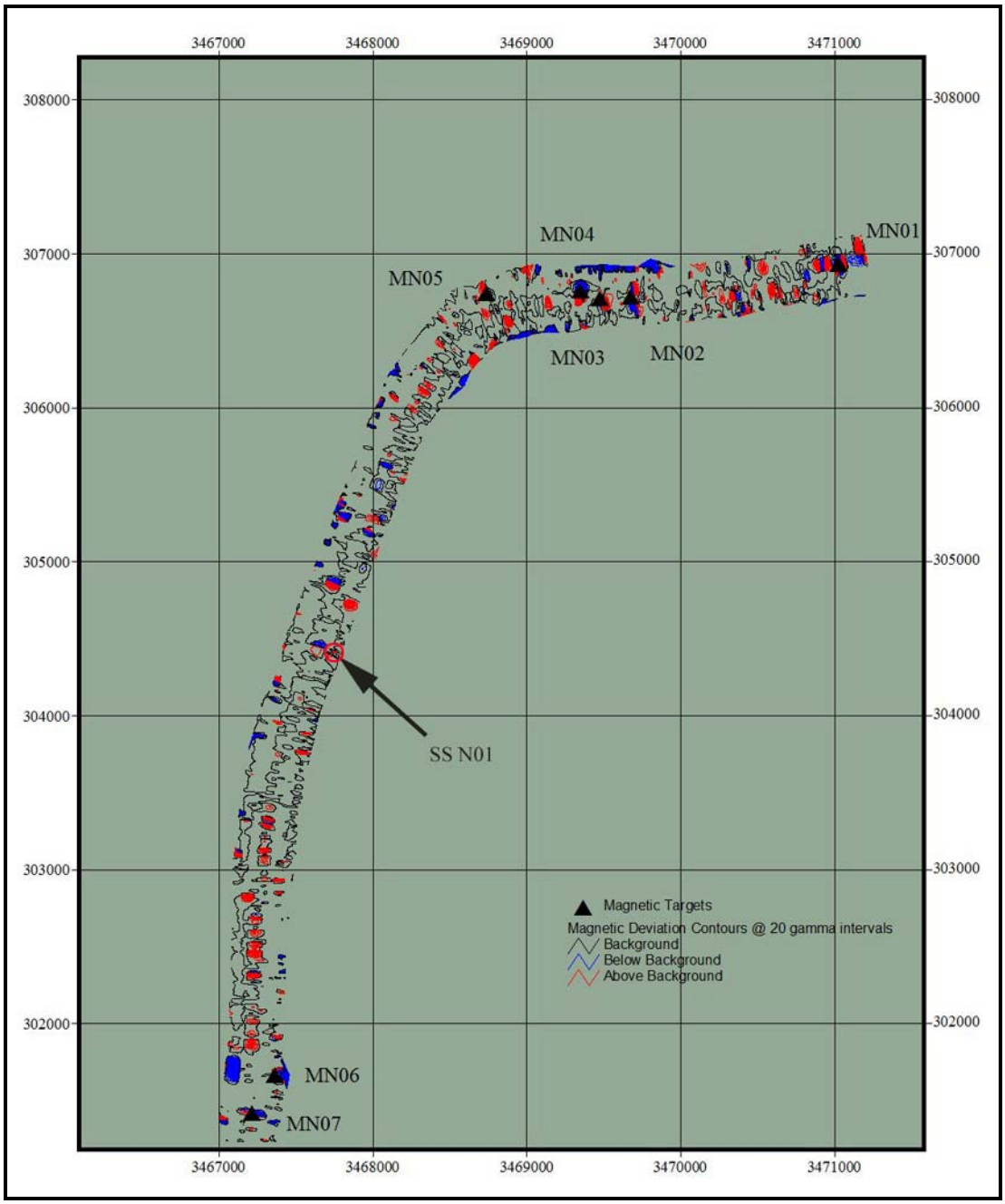

Figure 57. Magnetic data from the north half of the Northern Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MN" and side-scan sonar targets with "SSN."

The vast majority of the anomalies recorded in the Northern Section, and, in fact, along the entire bayou are small in amplitude, were recorded on a single survey line and cover a very small area along a line. A few magnetic anomalies displayed greater amplitude, were recorded on two or more adjacent lines, covered a larger area or in other ways met the criteria for possible cultural object of interest discussed previously. Essentially, these are anomalies whose signatures exhibited a deflection of more than 100 gammas and covered an area

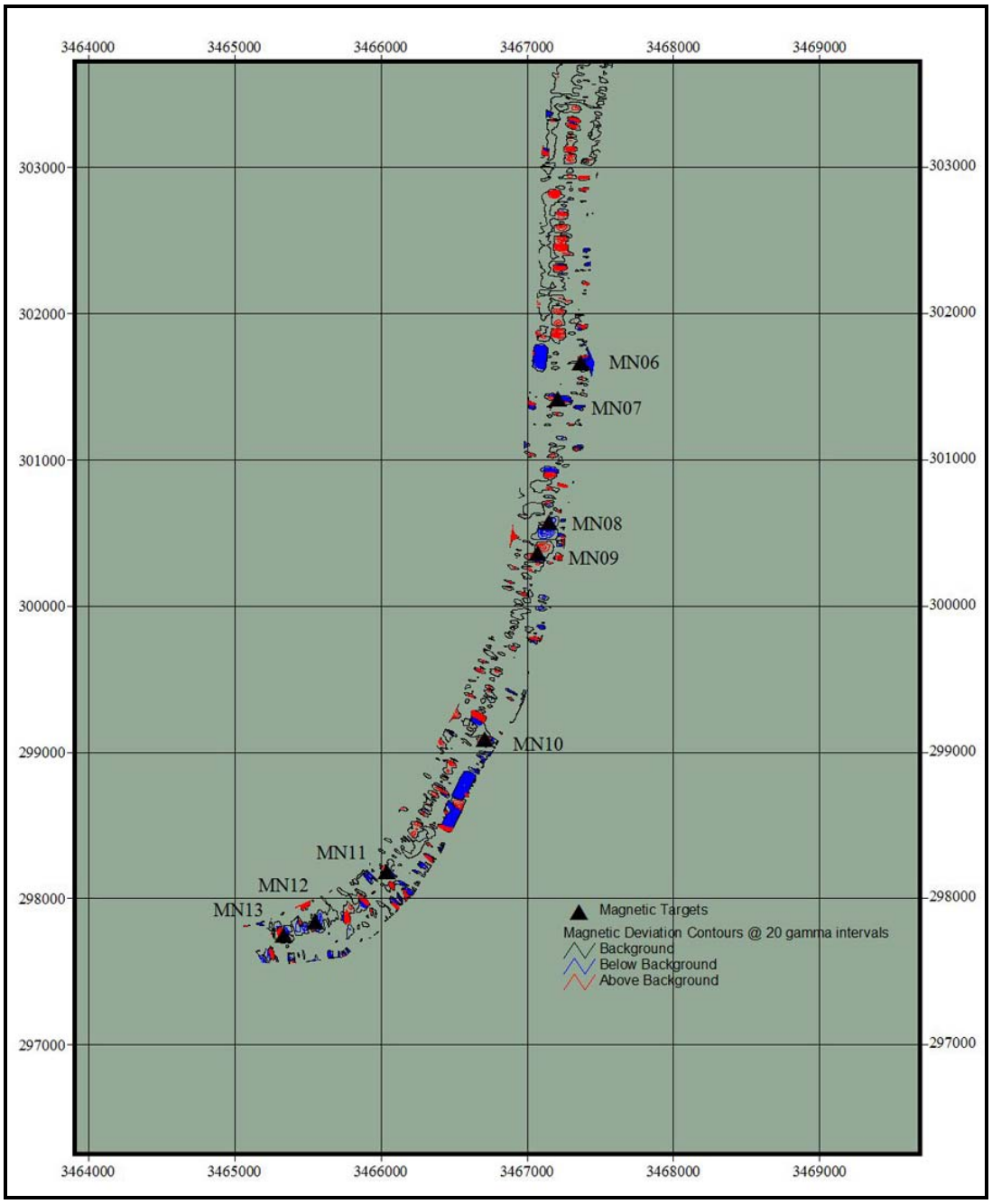

Figure 58. Magnetic data from the south half of the Northern Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MN."

greater than about 50 ft across. As seen in Table 10 and Figures 57 and 58, thirteen anomalies were ultimately selected for closer scrutiny. A couple of these anomalies were slightly less than 50 ft across but were selected because they displayed rather intense magnetics.

A great number of objects were observed on side-scan sonar records in the Northern Section as well as along the entire portion of the bayou surveyed. These included over 200

Table 10. Magnetic Anomalies of Interest Recorded in the Bayou Grand Caillou Survey Area.

Anomaly	Easting	Northing	Deviation +/-	Duration (ft)	Type
Northern Section					
MN01	3471032.80	306949.60	548/481	197	Complex D
MN02	3469689.00	306675.20	98/567	81	D
MN03	3469481.80	306684.40	851/111	68	D
MN04	3469354.80	306721.90	362/270	27	D
MN05	3468725.90	306727.30	392/46	136	D
MN06	3467384.20	301639.50	790/4818	102	Complex D
MN07	3467170.40	301427.30	54/300	48	D
MN08	3467116.60	300562.00	33/118	129	D
MN09	3467043.60	300343.40	66/76	61	M
MN10	3466749.90	299092.70	71/162	47	D
MN11	3466059.20	298173.00	94/na	54	M
MN12	3465572.70	297813.40	87/117	135	D
MN13	3465333.80	297770.90	228/85	95	D
Central Section					
MC01	3464927.50	297567.20	41/168	142	D
MC02	3464540.50	297416.30	na/142	34	M
MC03	3464044.50	296039.70	1925/514	40	D
MC04	3464189.10	295802.60	154/366	135	D
MC05	3463922.10	295581.50	99/426	135	Complex D
MC06	3461568.10	286066.60	2816/2439	95	D
MC07	3461535.20	285682.20	65/137	74	D
Southern Section					
MS01	3461629.40	285575.40	49/46	47	D
MS02	3461515.90	285268.50	132/39	122	M
MS03	3461570.50	284265.90	123/214	108	D
MS04	3461110.60	281967.20	2918/6212	540	D

C = complex, D = dipole, M= monopole

individual and clusters of crab traps, 487 identified submerged stumps and 127 small, unidentified "objects" resting on the bottom (Figures 59, 60, and 61). Many of the small magnetic anomalies could be correlated with the crab traps (Figure 62) or small, unidentified objects; those that could not exhibit signature characteristics typically associated with small pieces of trash and debris. It is believed that many of these small objects lie buried in the bayou and cannot be seen on side scan sonar images. As discussed previously, historic settlement once extended along part of the Northern Section and it is believed that most of these small magnetic anomalies are associated with overbank debris, docking facilities, etc. that are related to that settlement.

Ultimately, none of the magnetic anomalies recorded in the Northern Section, including those listed in Table 10, could be positively associated with significant cultural resources. Similarly, no objects seen on side-scan sonar records that might represent watercraft remains could be correlated with the many small magnetic anomalies recorded or

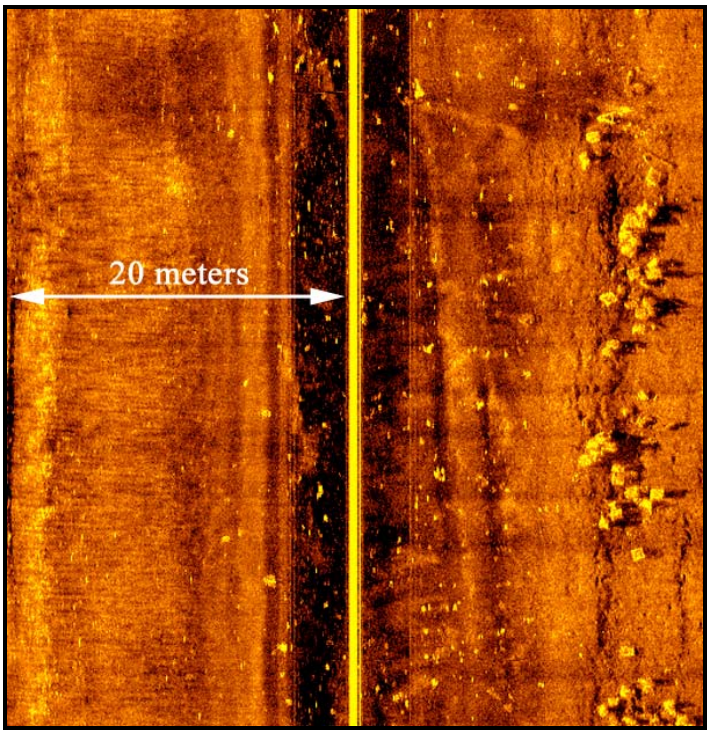

Figure 59. **Cluster of crab traps (right side of figure) recorded in the Northern Section of the Bayou Grand Caillou Survey Area.**

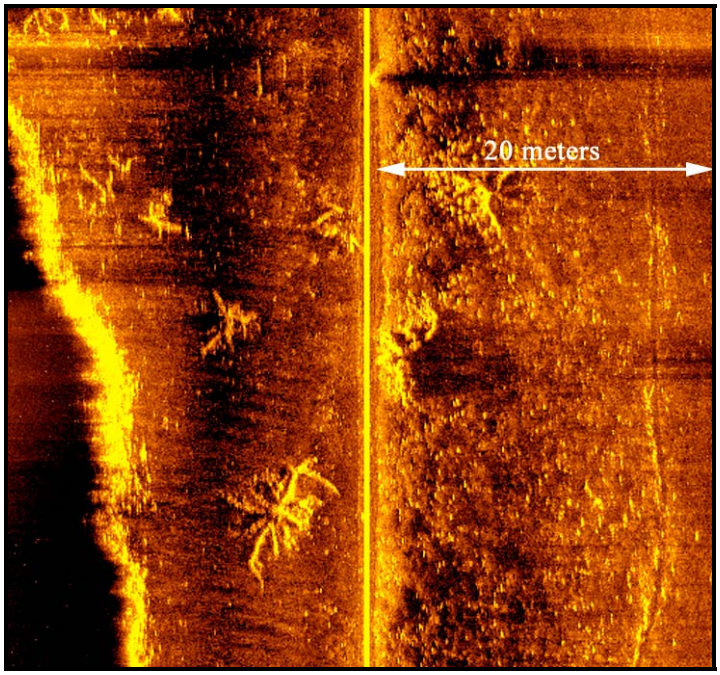

Figure 60. **Examples of submerged tree stumps recorded in Bayou Grand Caillou.**

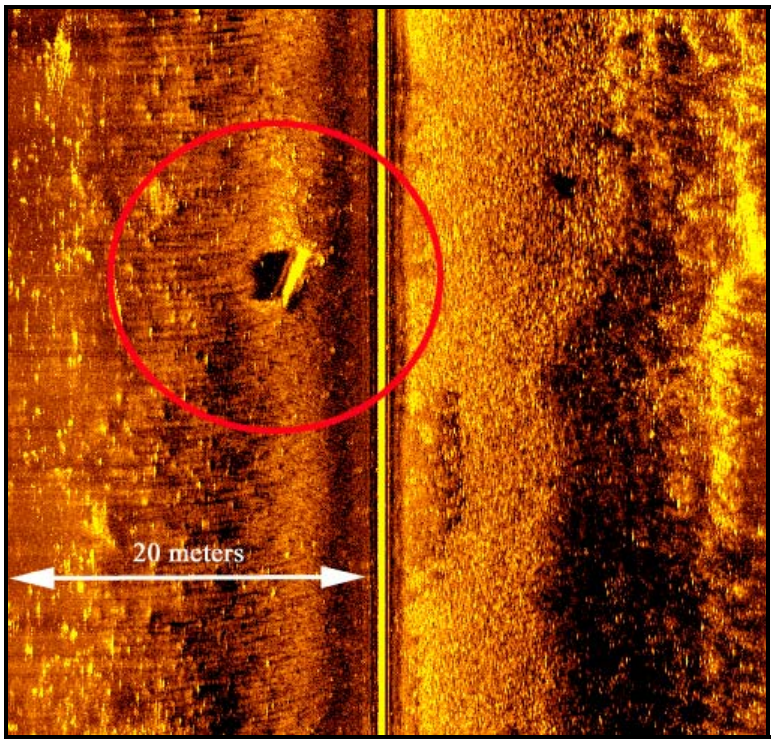

Figure 61. Unidentified object believed to be a piece of modern debris (pipe?) recorded in the Northern Section of the Bayou Grand Caillou Survey Area. Similar objects were observed on sonar records from the entire area surveyed and most are believed to represent modern debris or trash.

with the larger anomalies listed in Table 10. However, given that this area has seen occupation and use since at least the Civil War, there is a possibility that some of the magnetic anomalies in this area may be associated with important historic objects. Further, as is discussed in more detail below, there is a probability that historic watercraft remains, as well as other cultural material, do exist adjacent to the area of former settlement along Bayou Grand Caillou in the Northern Section.

One side scan sonar target of interest, however, was recorded in the Northern Section. This target is designated SSN01 in Figure 57 and is shown in Figure 63. This side-scan target is close to the east bank of the bayou and consists of several linear elements covering an area measuring 27 ft by 55 ft in size. The elements appear to be partially buried, but those that can be seen are geometrically regular and suggestive of man-made structure as opposed to a natural object. A small magnetic anomaly was recorded at the location of this side-scan target, but given the great number of similar small anomalies in the immediate area (see Figure 57), this signature cannot be positively correlated with the side scan sonar target.

While this object cannot be positively identified, it resembles the remains of known sunken vessels and is believed to be that, or some other type of man-made object. As seen in Figure 63, an area consisting of a somewhat amorphous mass of small, "point source" reflectors (light-colored) is located against the bank (left side of Figure 63) adjacent to

SSN01. This signature is characteristics of known shell deposits observed on side scan sonar records. This phenomenon, known as "scattering," occurs because the individual pieces of shell, oriented at many different angles, "scatter" the acoustic signal into many different directions through refraction, diffraction and reflection (Fish and Carr 1990:181).

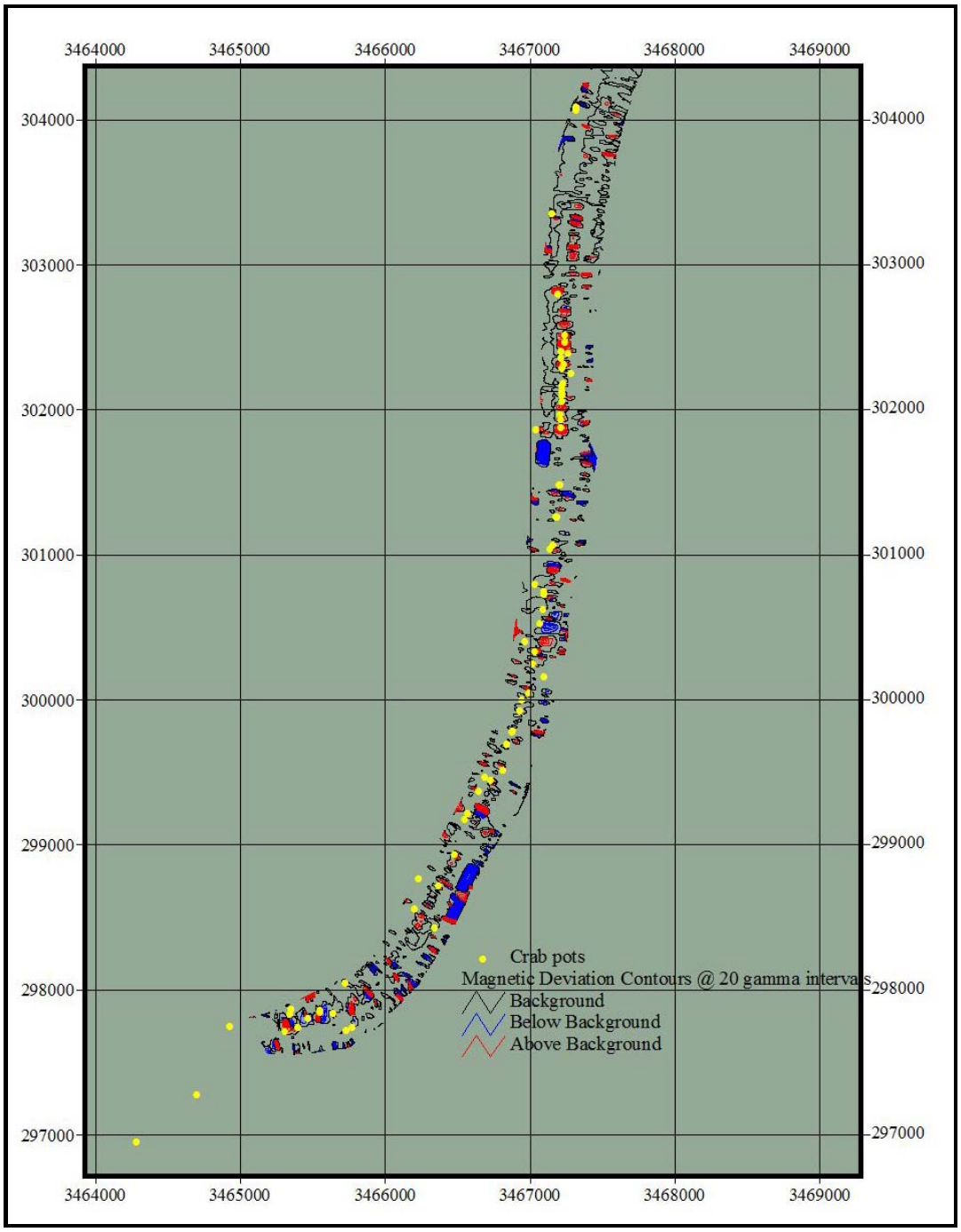

Figure 62. The locations of crab traps (yellow) seen on side scan sonar records overlaid on magnetic data in the lower portion of the Northern Section of the Bayou Grand Caillou Survey Area. Note the correlation of crab traps with many of the small magnetic anomalies.

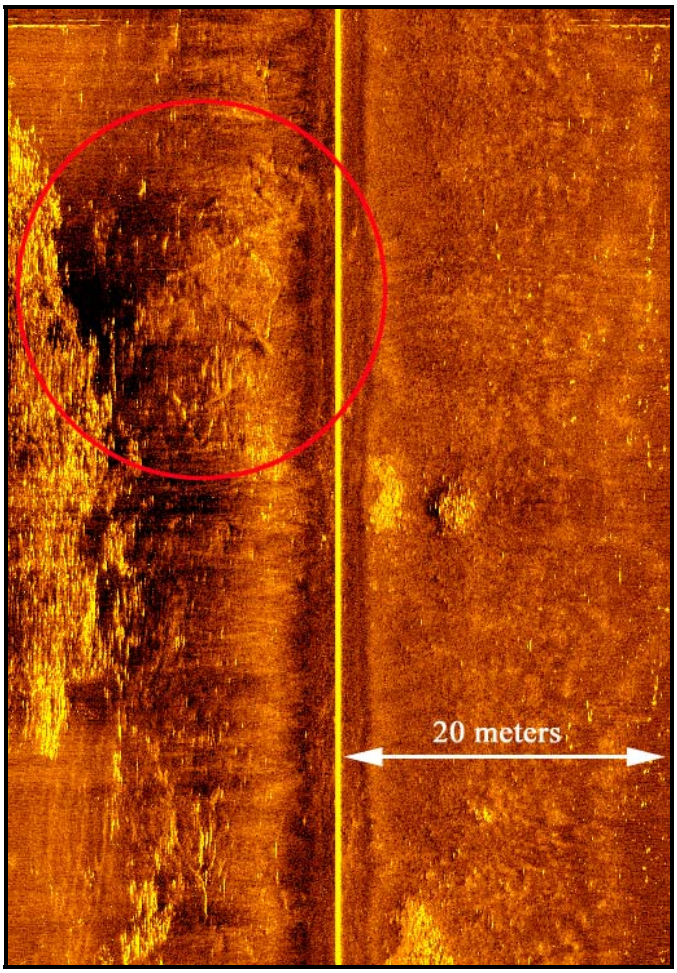

Figure 63. **Side Scan Sonar Target SSN01, recorded in the Northern Section of the Bayou Grand Caillou Survey Area.**

Central Section, Bayou Grand Caillou Survey Area

The Central Section of the Bayou Grand Caillou Survey Area measured 2.51 miles (13260 ft) long. In the upper third of this area, it was possible to run only eight survey lines within the bayou. Ten survey lines could be run in most of the lower two-thirds of this section. However, at the very southern end of this section, the bayou widens considerably and it was possible to place 16 survey lines within the channel. Figure 64 shows the survey lines actually run in the Central Section. Water depths in this section ranged from about 2.5 ft along the banks to a maximum depth of 10.9 ft.

As in the Northern Section, a large number of magnetic anomalies were recorded within the Central Section. As seen in Figures 65 and 66, the majority of these are small anomalies believed to be associated with single pieces of debris or trash. However, seven magnetic anomalies did display signatures that met the criteria for possible cultural remains of interest (see Table 10). Three of these anomalies, MC03, MC04 and MC05, are clustered together in the upper portion of this section (see Figure 65). Careful evaluation of all of these

anomalies and correlation with side scan sonar records has suggested that all are likely to be related to non-significant debris or other objects. None are believed to be associated with historic properties of interest.

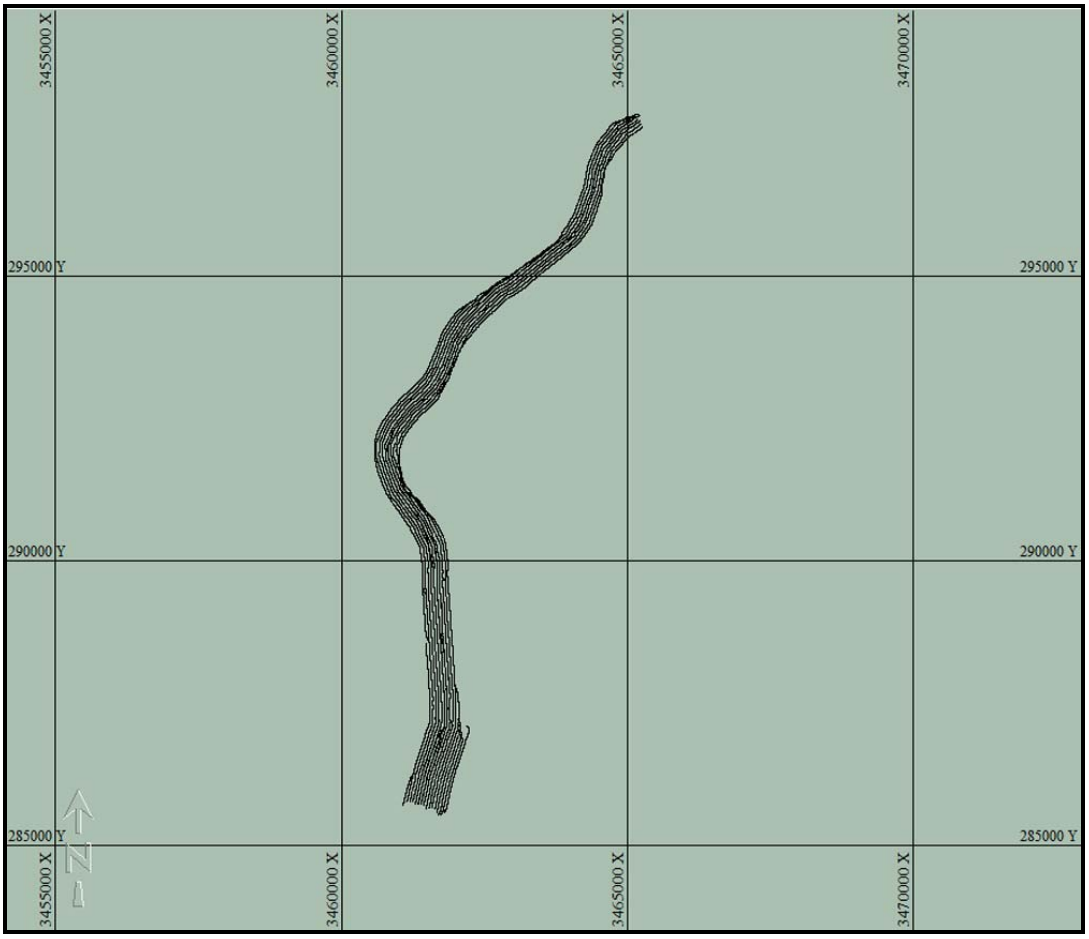

Figure 64. Postplot of survey lines run in the Central Section of the Bayou Grand Caillou Survey Area. Coordinates are Louisiana South State Plane, NAD83.

No side scan sonar targets that resembled potentially significant cultural objects were observed in the Central Section. However, numerous crab traps, unidentified small objects and tree stumps were observed on sonar records. Tree stumps were particularly numerous along the western bank of Bayou Grand Caillou in the lower portion of the Central Section. Figure 67 shows the locations of identified submerged stumps overlaid on the magnetic contour data that shows an almost continuous line of stumps along the west bank in the lower one-half of this area. Most of the stumps seen in side scan sonar records are believed to represent trees that originally grew in the bayou, presumably cypress. If these are cypress, they would have been cut many years ago. It is also possible that some of these stumps represent trees that grew on the natural levees of the bayou. These levees have largely subsided and only remnants are now exposed along the bayou's edges. In fact, today no trees stand along this portion of Bayou Grand Caillou, but these submerged stumps provide evidence of what once existed. It is suspected that many of these stumps are in their original

growth position and their present depth below the water's surface is a measure of the amount of subsidence that has occurred here since they were living.

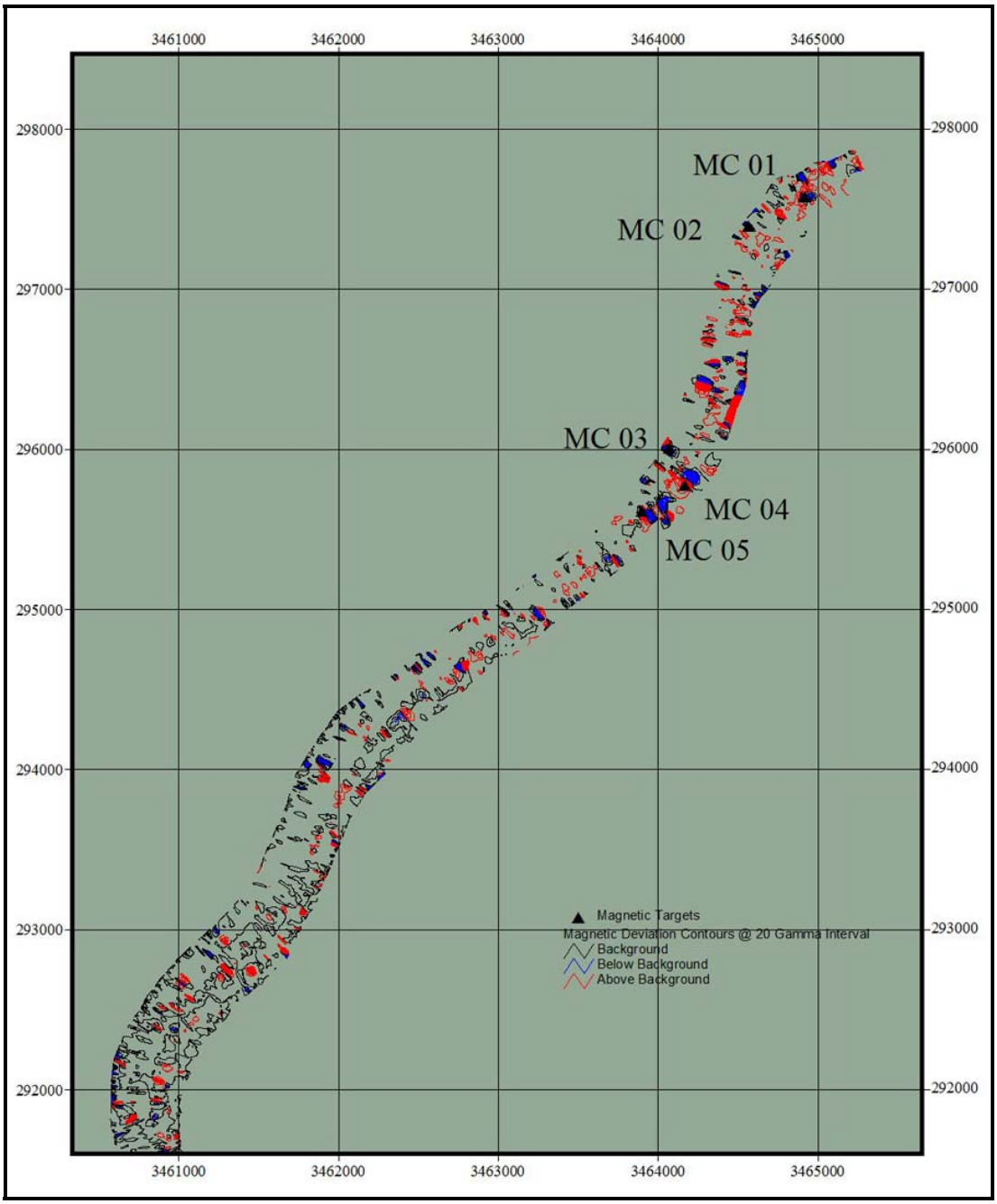

Figure 65. Contoured magnetic data from the north half of the Central Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MC."

Southern Section, Bayou Grand Caillou Survey Area

The Southern Section of the Bayou Grand Caillou Survey Area measured 1.65 miles (8697 ft) long. It was possible to run 16 survey lines within the bayou in this entire section

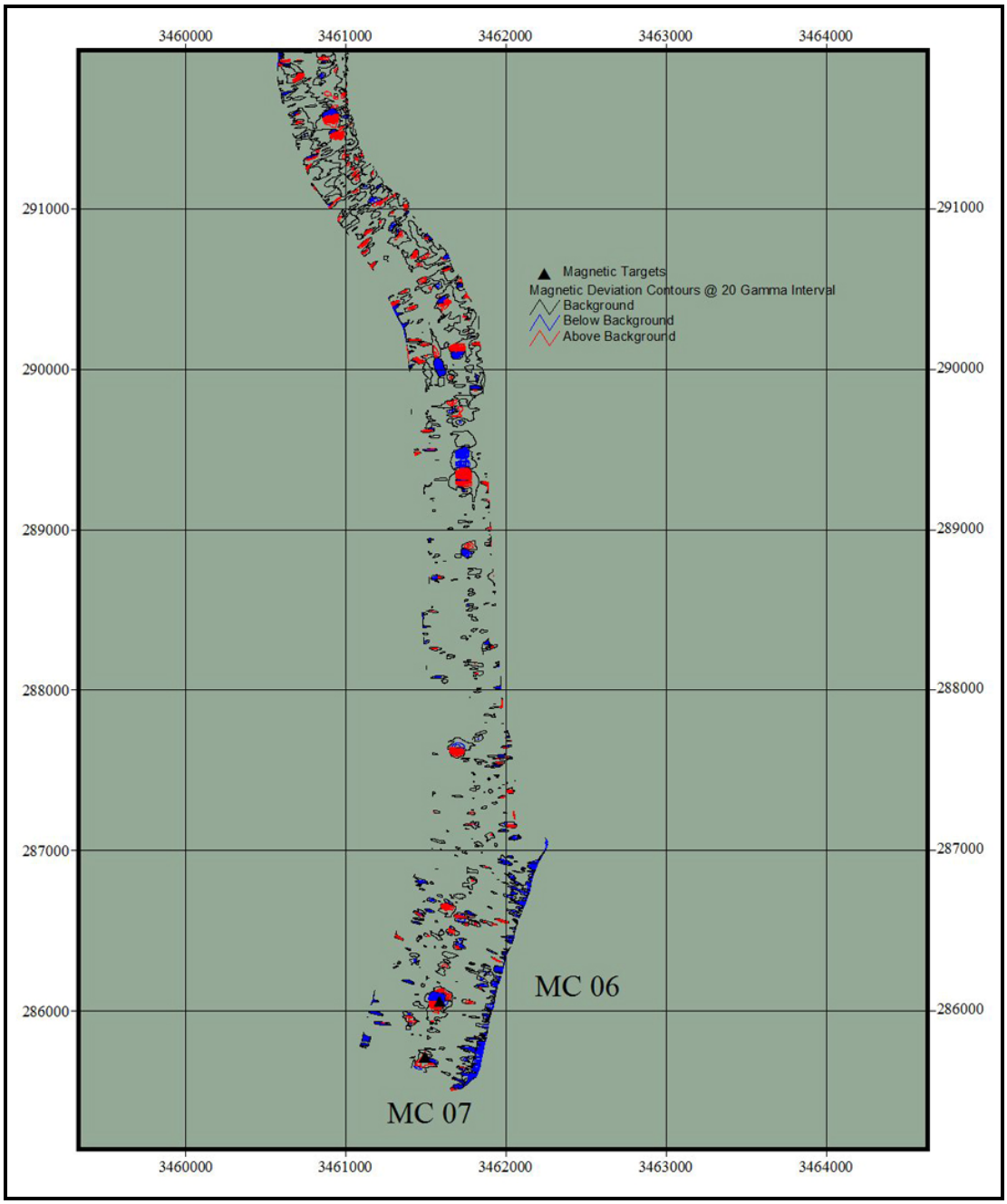

Figure 66. Contoured magnetic data from the south half of the Central Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MC."

(Figure 68). Water depths in this section ranged from about 2.5 ft along the banks to a maximum depth of 12.2 ft.

Contoured magnetic data for the Southern Section are shown in Figures 69 and 70. As in the other two sections of the Bayou Grand Caillou Survey Area, numerous small magnetic anomalies were recorded. However, the density of these small anomalies does tend

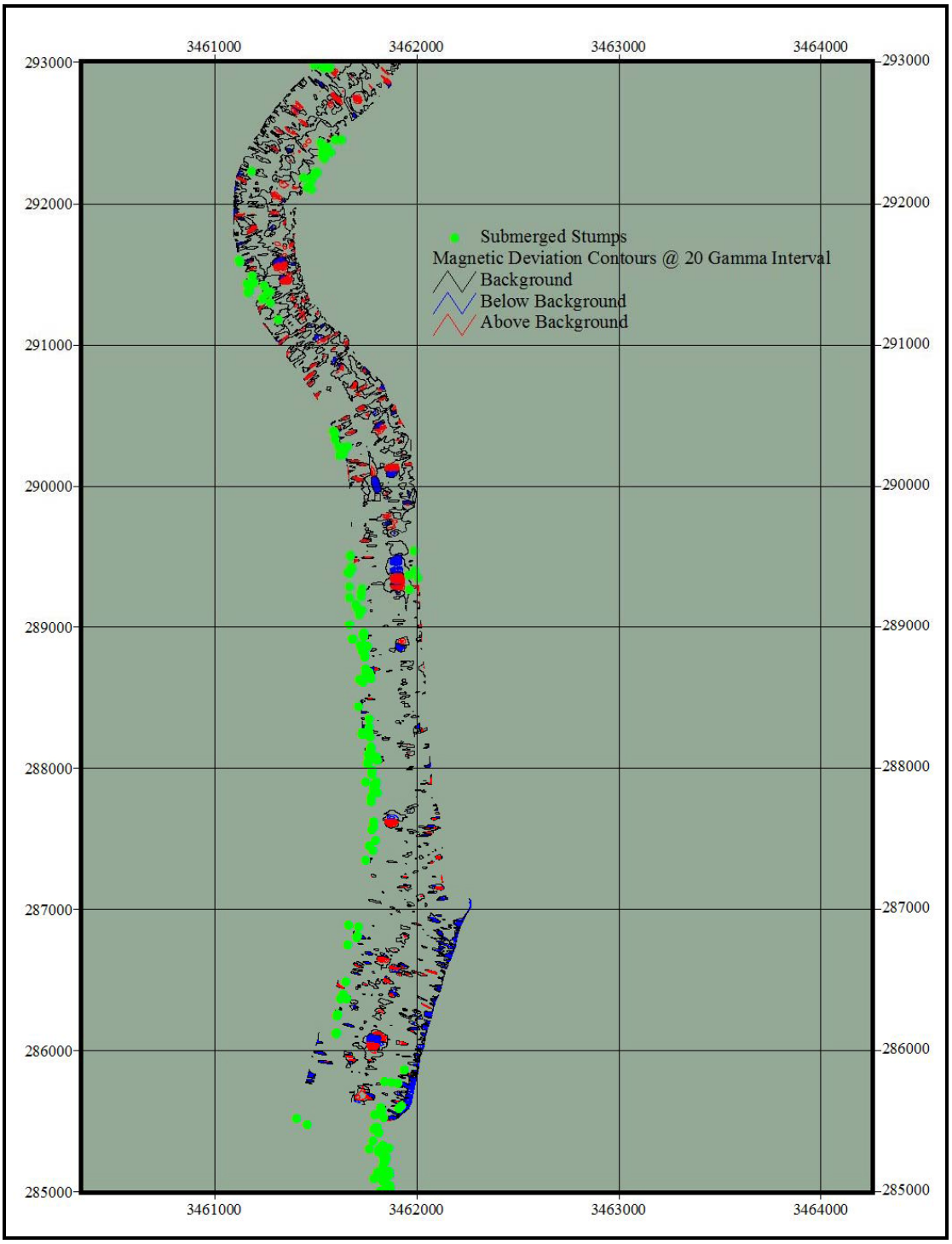

Figure 67. Submerged tree stumps (green) identified on side scan sonar records overlaid on contoured magnetic data in the lower portion of the Central Section of the Bayou Grand Caillou Survey Area. Note the almost continuous line of stumps against the west bank of the bayou in the lower portion of this figure.

to decrease toward the lower end of this section. As in the other two areas, it is believed that these small magnetic anomalies are associated with items such as crab traps or small pieces

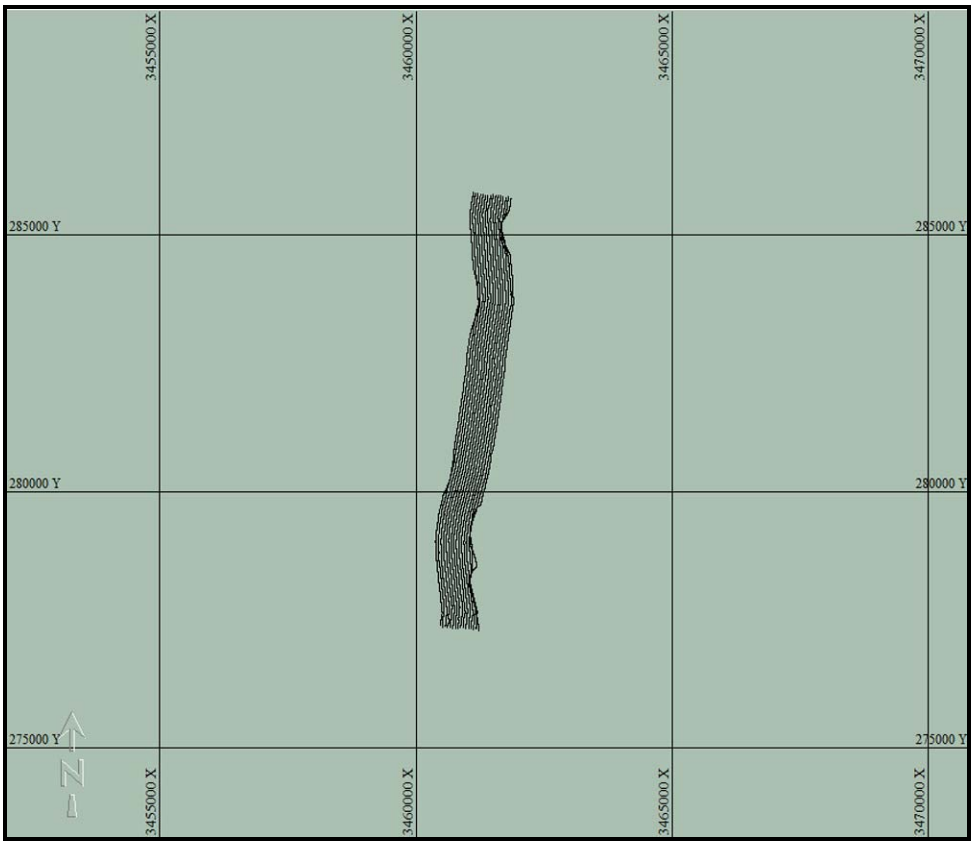

Figure 68. Postplot of survey lines run in the Southern Section of the Bayou Grand Caillou Survey Area. Coordinates are Louisiana South State Plane, NAD83.

of modern debris. However, four magnetic anomalies were recorded that displayed signature characteristics of known historic vessels (see Table 10, Figures 69 and 70). No objects seen on side scan sonar records could be correlated with any of these magnetic anomalies. After careful analysis, three of these were eliminated as potential historic properties of concern. However, magnetic Anomaly MS04, was not eliminated. This anomaly is not only very intense, with a total magnetic deflection of over 9,000 gammas but it covers a large area, approximately 540 ft across (see Table 10).

Although no objects seen on side scan sonar records are interpreted as possible historic properties, a number of submerged tree stumps and unidentified small objects were observed. Tree stumps were particularly numerous in the upper portion of the Southern Section as seen in Figure 71.

Summary of Findings in the Bayou Grand Caillou Survey Area

The remote-sensing survey of Bayou Grand Caillou recorded a surprising number of individual magnetic anomalies. The vast majority of these represent small, low intensity signatures, many of which could be directly associated with the numerous crab traps or small, unidentified objects seen on side scan sonar records. It is suspected that many of the other

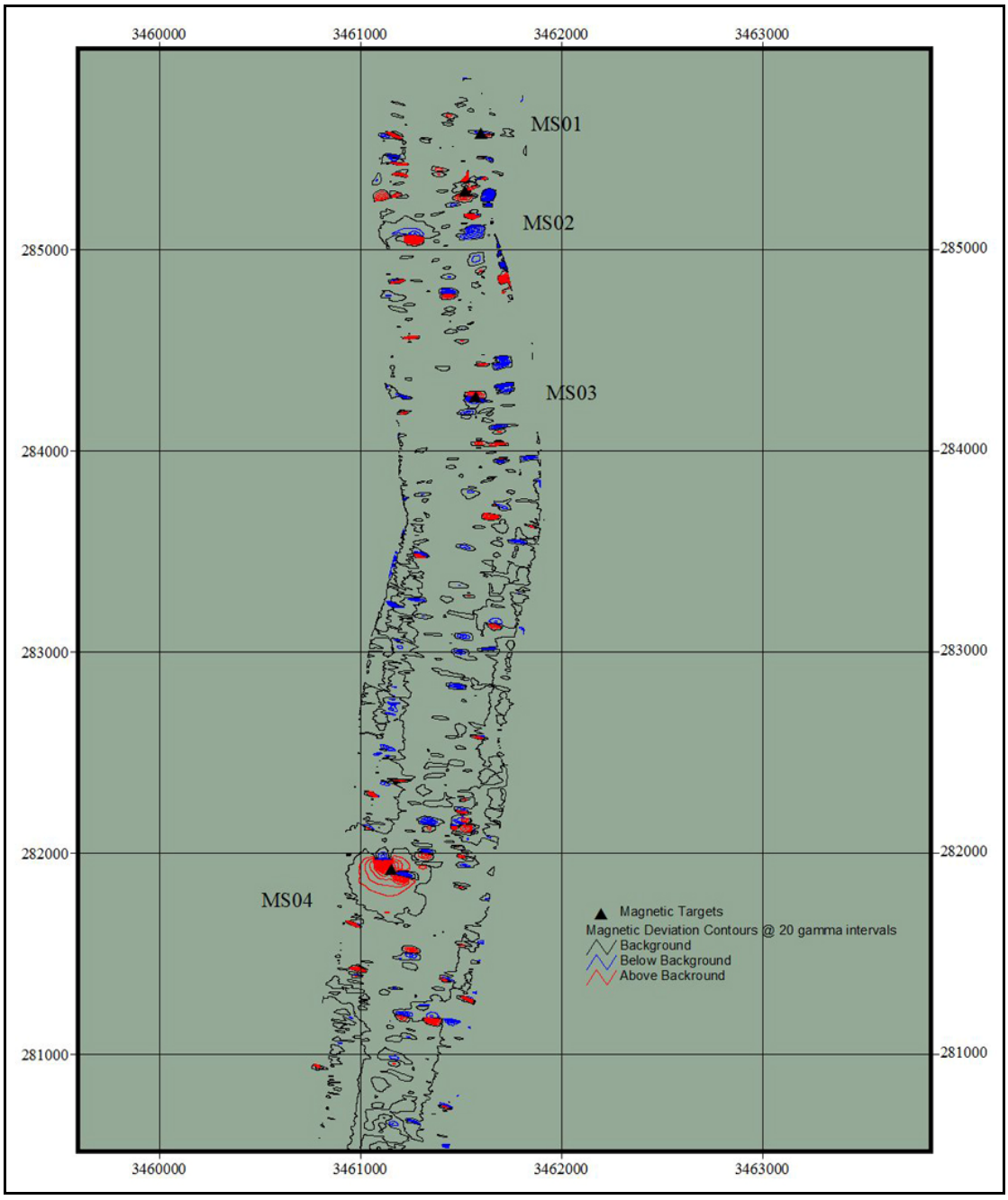

Figure 69. Contoured magnetic data from the north half of the Southern Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MS."

small magnetic anomalies are produced by similar objects that are either buried or not obvious on the side scan sonar records. Of interest, of course, is what are these small unidentified objects and where do they come from. Some of these items certainly represent modern objects lost or purposefully thrown from vessels using the bayou in recent years. These items may be pieces of pipe, cable, metal drums, or any number of similar ferrous metal items. This pattern of miscellaneous objects scattered along the routes of heavily

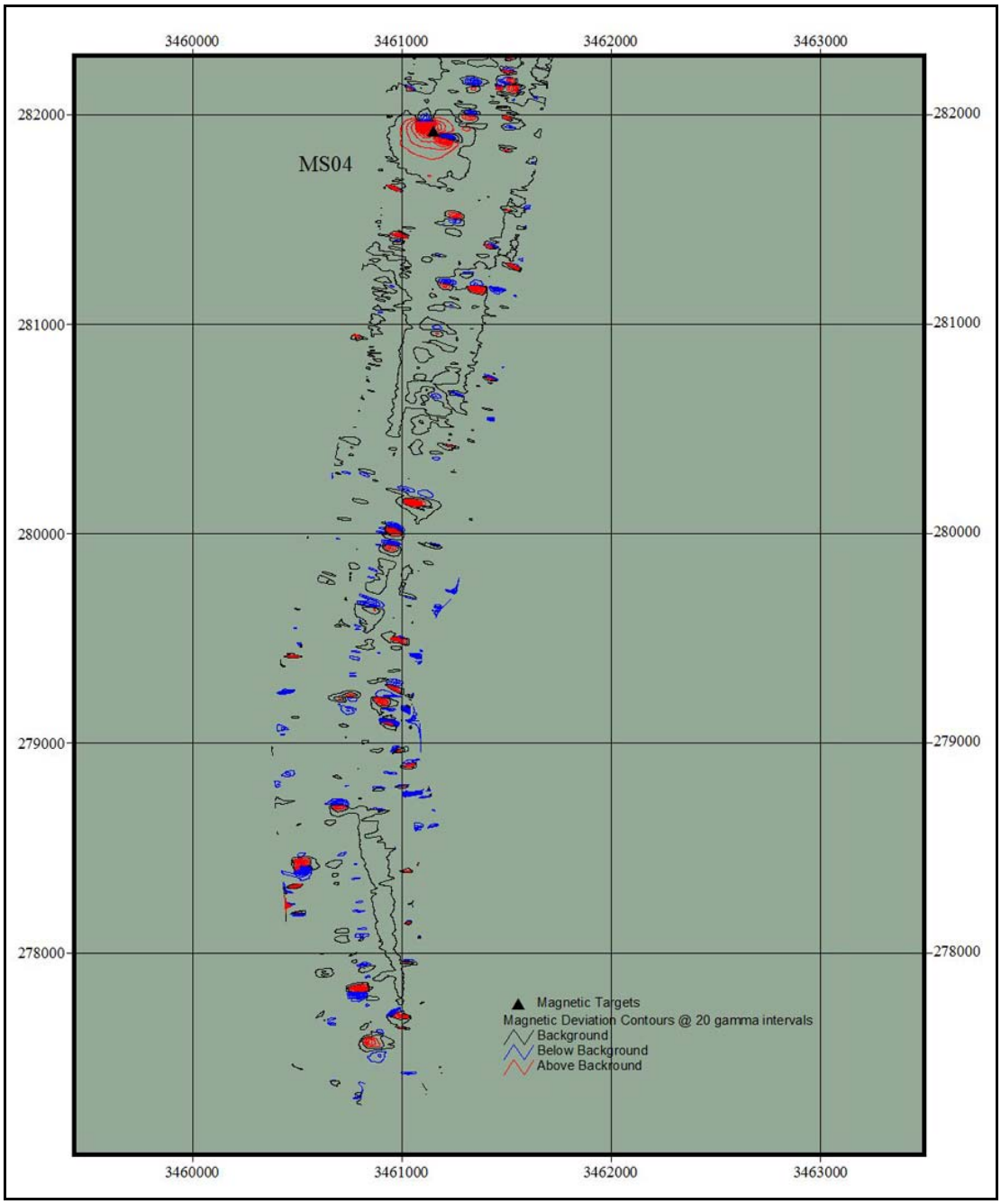

Figure 70. Contoured magnetic data from the south half of the Southern Section of the Bayou Grand Caillou Survey Area. Magnetic targets of interest are identified with "MS."

traveled waterways has been observed in many remote-sensing surveys undertaken in the region.

Although most of the unidentified objects appear to be related to modern debris, some may derive from historic occupation along this portion of the bayou, which could date back to the eighteenth century. As noted previously, maps from the 1930s show a number of

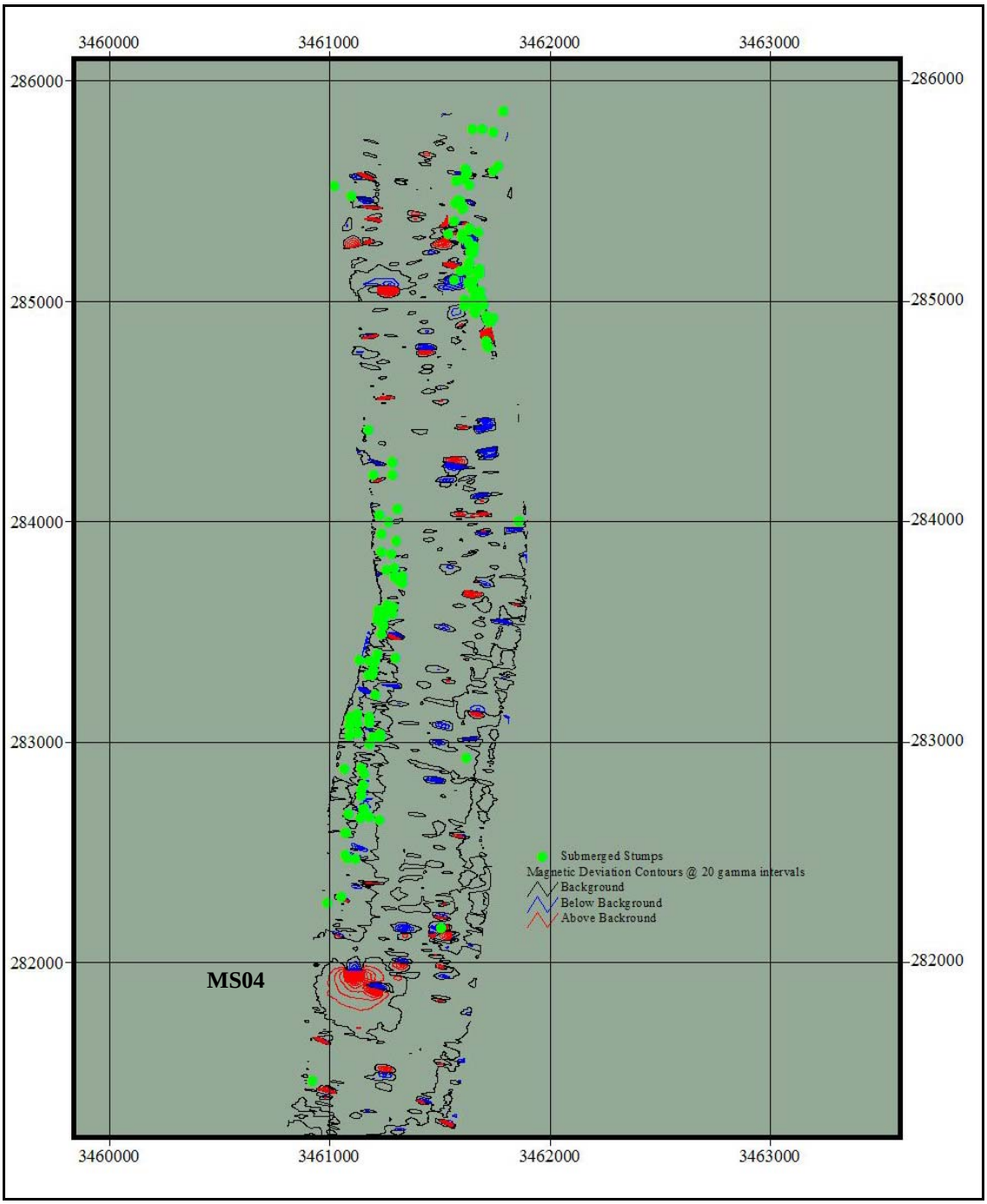

Figure 71. Submerged tree stumps (green) identified on side scan sonar records overlaid on contoured magnetic data in the upper portion of the Southern Section of the Bayou Grand Caillou Survey Area.

houses lining the west bank of Bayou Grand Caillou for almost a mile below Mound Bayou (see Figure 55). How far back in the past settlement existed here is presently unknown, but the Civil War earthwork, Fort Quitman, did exist in this area. Similar settlement settings in south Louisiana indicate that docks would have existed along the bayou where boats were moored. In addition, a variety of discarded trash and debris commonly accumulate as

overbank deposits in these types of bayou-side settlement settings. So, some of the magnetic anomalies recorded along the west bank in the Northern Section of Bayou Grand Caillou may be related to metallic items associated with former dock structures as well as from trash and debris deposited along the bank of the bayou. Based on our present knowledge of settlement in this area, these materials could date from the mid-nineteenth century or earlier.

Studies from waterways in the region have also demonstrated that old and decrepit boats are commonly abandoned near settlements and docking areas where they eventually deteriorate and become submerged and/or buried. Typically, these watercraft are abandoned close to a bank line where they will not impede navigation on the waterway. This phenomenon has been specifically recorded along areas of Bayou Grand Caillou a short distance north of the present survey area (Flayharty and Mueller 1983) and at other nearby waterways (see Pearson and Saltus 1991 for Bayou Shaffer and Stout 1992 for Bayou Du Large). Well-preserved boat remains dating from the mid-nineteenth century to the present have been discovered along these and other Louisiana waterways at locations where bankside settlements exist or formerly existed. Thus, it is possible that some of the magnetic anomalies recorded in Bayou Grand Caillou, especially along the west bank in the Northern Section, may be related to historic watercraft. No obvious watercraft remains were visually observed during the survey or seen on side scan sonar records in association with these magnetics. However, it is likely that historic boat remains, if they exist, will be fragmentary, submerged and partially or totally buried making them difficult or impossible to see on sonar records. This is a pattern commonly found along other similar waterways in south Louisiana. In light of these facts, the western side of Bayou Grand Caillou for about one mile below the mouth of Mound Bayou is considered to be a high probability area relative to historic cultural resources. Recommendations for how to treat this area in light of the proposed dredging of the bayou are provided in the final chapter of this report.

Ultimately, all but two of the many magnetic and side-scan sonar targets recorded along Bayou Grand Caillou were eliminated from consideration as possible submerged historic resources. One of these consists of the magnetic anomaly designated MS04 and the other consists of the side scan sonar target designated SSN01. Information on these targets is presented in Table 10 above. Magnetic anomaly MS04, recorded in the Southern Section of the Bayou Grand Caillou Survey Area, displayed a magnetic signature similar to that of known historic shipwrecks. This magnetic anomaly consists of an intense dipolar signature measuring 540 ft across, lying near the western bank of the bayou. No objects were seen at this location on side-scan sonar records suggesting the source of the magnetics is buried. In view of its similarity to known shipwreck signatures, it is recommended that anomaly MS04 receive additional examination to determine its identity and National Register eligibility.

The other target of interest consists of side-scan sonar image SSN01 that was recorded in the Northern Section of the Bayou Grand Caillou Survey Area (see Table 10 and Figure 62). This target appears to be a partially buried object, or objects, displaying regular, geometric structure typically associated with cultural features as opposed to natural objects. SSN01 is located close to the east bank of the bayou and consists of several linear elements covering an area measuring 27 ft by 55 ft in size. No magnetic signature could be directly correlated with this target. It is of some interest that SSN01, which resembles the remains of

a man-made structure of some sort, is located on the bank opposite the area of known occupation along Bayou Grand Caillou. This location, near settlements and docks, but on the opposite side of the waterway where a sunken vessel would not interfere with boats using the docks, is a very typical pattern seen for vessel abandonments in south Louisiana. This fact strengthens the possibility that this sonar target may represent the remains of a submerged watercraft. In light of this, it is recommended that this target receive additional examination to determine its identity and National Register eligibility. In addition, as discussed previously, it is possible that a shell deposit exists along the bank of the bayou immediately adjacent to SSN01. The identity of this feature should be assessed if additional work is required at target SSN01.

In summary, neither of these two targets in Bayou Grand Caillou can be positively identified, but, given the available data, neither can be eliminated as possible remains of historic vessels. In addition, the area along the western bank of Bayou Grand Caillou for about one mile below Mound Bayou is considered a sensitive area relative to historic properties. At present, the exact dimensions of the area to be dredged along Bayou Grand Caillou are unknown, but, if possible, it is recommended that the two targets and the bank line area below Mound Bayou be avoided by dredging. If it is impossible to avoid this area or the two targets, it is recommended that each be physically evaluated to determine their significance relative to National Register criteria. Recommendations for the treatment of these three locations are provided in Chapter 7.

CHAPTER 7

SUMMARY AND RECOMMENDATIONS

Archaeological Sites

The terrestrial archaeological surveys examined four previously recorded archaeological sites and located 12 unrecorded sites. Table 11 summarizes information on the eligibility, potential project effects, and recommendations for each site.

Table 11. Recommendations for Archaeological Sites Investigated During the Survey.

Site No.	Location	Site Type	Eligibility	Effects	Recommendations
16TR12	HNC MP 11.8	shell midden	not eligible	None	No further work
16TR14	West Area	shell midden	not eligible	None	No further work
16TR18	HNC MP 11.8	shell midden	not eligible	None	No further work
16TR72	HNC MP 17.7	shell midden	unknown	None	No further work
16TR312	HNC MP 33.2	shell midden	not eligible	None	No further work
16TR313	HNC MP 29.7	shell midden	not eligible	None	No further work
16TR314	HNC MP 28.8	shell midden	not eligible	None	No further work
16TR315	HNC MP 28.9	shell midden	not eligible	None	No further work
16TR316	HNC MP 26.5	shell midden	not eligible	None	No further work
16TR317	HNC MP 27.6	shell midden	not eligible	None	No further work
16TR318	Area 21b	shell midden	not eligible	None	No further work
16TR319	HNC MP 19.2	shell midden	not eligible	None	No further work
16TR320	HNC MP 15.8	shell midden	not eligible	None	No further work
16TR321	HNC MP 11.1	shell midden	not eligible	None	No further work
16TR322	near Area 21	earth mound	unknown	None	No further work
16TR323	HNC MP 31.5	shell midden	not eligible	None	No further work

Fourteen of the sites are not considered eligible for the National Register of Historic Places. These sites are small shell middens that have been impacted by the initial construction of the Houma Navigation Canal and subsequent bankline erosion. They yielded small numbers of artifacts and no evidence of intact cultural deposits. No further work is recommended at any of these sites.

The two remaining sites, 16TR72 and 16TR322, are located outside of the proposed project areas. If intact deposits exist at 16TR72 they are now buried beneath a modern marine gas station and camps. This area is located about 100 m from the HNC and should

not be affected by the proposed dredging. Site 16TR322 is a possible earth mound located about 300 m west of one of the disposal areas. It needs to be investigated further to determine whether it is a prehistoric feature, but regardless it will not be affected by the proposed project.

Marine Cultural Resources

During this study, five areas were examined by remote-sensing survey. These areas were: 1. Offshore Survey Area 1 (SPD MI. - 1.7); 2. Offshore Survey Area 2 (SPD MI. – 2.5); 3. the Isle Derniere Survey Area, 4. the Timbalier Island Survey Area, and 5. the Bayou Grand Caillou Survey Area. A brief statement of findings and recommendations for future treatment of each of these areas is provided below.

Offshore Survey Area 1 (SPD MI. - 1.7)

Two magnetic anomalies, designated Anomaly M001 and Anomaly M002, were identified in Offshore Survey Area 1. An evaluation of these anomalies suggests that they are produced by modern objects. One, Anomaly M001, may be a piece of dredge pipe. No potentially significant cultural resources were identified in this area and no additional work is recommended.

Offshore Survey Area 2 (SPD MI. – 2.5)

Two magnetic anomalies were identified in Offshore Survey Area 2, Anomaly M003 and Anomaly M004. Both anomalies represent large and intense magnetic signatures, believed to be related to modern objects. As discussed previously, two pieces of dredge pipe were removed from a location immediately adjacent to Offshore Survey Area 2 as part of the Louisiana Underwater Obstruction Removal Program. It is considered likely that the two magnetic anomalies recorded within this survey area represent similar pieces of pipe or other objects related to previous dredging of Cat Island Pass. No potentially significant cultural resources were identified in this area and no additional work is recommended.

Isle Derniere Survey Area

Five pipelines and several individual magnetic anomalies were identified in the Isle Derniere Survey Area. Three of the individual anomalies displayed some of the characteristics of known shipwreck magnetic signatures. These are Anomalies M005, M006 and M007. It has been determined that Anomaly M007 is related to an oil/gas well designated VUQ;LPU 17, Number 003 (Louisiana Department of Natural Resources 2007). Anomalies M005 and M006 display moderately strong magnetic deflections, but each covers a relatively small area. Side scan sonar imagery revealed no objects on the bay floor at the locations of these two anomalies, suggesting the source objects are buried. Given the intensive amount of oil and gas activity in the area, it is suspected that these two magnetic anomalies are related to features or debris associated with those activities. No objects or features believed to represent significant cultural remains were identified in the Isle Derniere Survey Area and no additional work is recommended.

Timbalier Island Survey Area

A large number of pipelines were revealed in the magnetic data collected in the Timbalier Island Survey Area. As discussed previously, 32 individual pipelines were identified in this area, but the magnetic signatures are so overlapping in some locations that some pipelines may have been missed. The concentration of wells and pipelines in this area is related to the presence of the Caillou Island Salt Dome, located beneath Terrebonne Bay immediately north and northeast of the survey area.

In much of the Timbalier Island Survey Area, the magnetic signatures of the numerous pipelines will have "masked" signatures produced by any sunken vessels that might exist. Thus, heavy reliance was placed on side scan sonar records in the identification of possible cultural resources. Side scan sonar imagery showed no features that could be identified as possible boat remains or other potentially significant cultural resources.

Two magnetic anomalies that are spatially distinct from the many pipeline signatures were identified in the Timbalier Island Survey Area. Designated Anomalies M008 and M009, these anomalies consist of complex magnetic signatures that display deflections greater than 500 gammas and cover areas over 300 ft across. Neither anomaly can be correlated with reported wellheads or other features of the oil and gas industry. However, given the number of oil/gas industry features in this area, there is a high probability that these anomalies are related to unreported, lost or discarded objects associated with these activities. As noted previously, no objects were seen on side scan records near these anomalies. These two anomalies are unlikely to represent significant cultural remains. No objects of features believed to represent significant cultural remains were identified in the Timbalier Island Survey Area and no further work is recommended.

In summary, no historic properties were identified in either the Timbalier Island or Isle Derniere survey areas, so there is no need for the Corps of Engineers to consider any additional efforts related to cultural resources in these areas. Although cultural resources are not of concern, the planned island restoration projects do need to take into account the numerous pipelines, wells, abandoned wells, and structures existing in the two areas. Engineering planning and field efforts have to insure that none of these features are damaged or impacted during the restoration process, because this could result in serious environmental harm to the Terrebonne Bay area.

Bayou Grand Caillou

The remote-sensing survey of Bayou Grand Caillou recorded a great number of individual magnetic anomalies and side scan sonar targets. The vast majority of the magnetic anomalies consist of small, low intensity signatures, many of which can be directly associated with crab traps or small, unidentified objects seen on side scan sonar images. Most of these unidentified objects are believed to represent modern items lost or purposefully thrown from vessels using the bayou in recent years, including pieces of pipe, cable, metal drums, or similar ferrous metal items. This scatter of miscellaneous objects scattered along the routes of heavily traveled waterways is a pattern that has been observed on other modern navigation routes in the region. Many of the side scan sonar targets identified along Bayou Grand Caillou consist of tree stumps, reflecting a time when the environment along the bayou supported their growth.

Only two of the many magnetic and side scan sonar targets recorded along Bayou Grand Caillou are identified as potential cultural properties of interest. One of these is the magnetic anomaly designated MS04 and the other is of the side scan sonar target designated SSN01. Neither of these two targets can be positively identified as potentially significant historic properties, but, when considered within the context of the known settlement and navigation histories of Bayou Grand Caillou, neither can be eliminated as possible remains of historic vessels. In addition, as discussed previously, it is possible that a shell deposit exists along the bank of the bayou, immediately adjacent to SSN01. The identity of this feature should be assessed in conjunction with work at target SSN01.

It is recommended that the locations of MS04 and SSN01 be avoided by dredging. It is specifically recommended that no dredging be conducted within 75 ft of either target. If avoidance is not possible, then it is recommended that each target be further examined to determine its identity and National Register eligibility. Diving will be required to collect the information necessary to make this determination. Since all or parts of the objects at these two target locations appear to be buried, some type of subbottom examination will be necessary. This may entail hand probing or the use of a hydraulic probe. Additionally, limited underwater excavations may be necessary to expose enough area at each target location to collect the information needed to make a determination of National Register eligibility.

In addition to these two target locations, the area along the western bank of Bayou Grand Caillou just below Mound Bayou is considered a sensitive area relative to historic properties. As discussed previously, maps from the 1930s show a number of houses lining the west bank of Bayou Grand Caillou for almost a mile below Mound Bayou. How far back in the past settlement existed here is presently unknown, but the Civil War earthwork, Fort Quitman, did exist in this area. Studies from other waterways in south Louisiana show that old and decrepit boats are often abandoned near settlements and docking areas where they eventually deteriorate and become submerged and/or buried. Typically, these watercraft are abandoned close to a bankline where they will not impede navigation of the waterway. This phenomenon has been specifically recorded along areas of Bayou Grand Caillou a short distance north of the present survey area (Flayharty and Muller 1983) and at other nearby waterways (see Pearson and Saltus 1991 for Bayou Shaffer and Stout 1992 for Bayou du Large). Thus, it is possible that abandoned watercraft exist submerged and/or buried along the west bank of Bayou Grand Caillou just south of Mound Bayou where settlement formerly occurred. If these vessels are buried, they will not be visible on side scan sonar records. Experience has shown that careful physical examination of these high probability bankline areas is required to locate watercraft remains that might exist. If dredging impacts are to occur within 75 ft of the west bank of Bayou Grand Caillou it is recommended that a pedestrian survey be conducted along the western bankline for a distance of one mile south of Mound Bayou. The survey should involve careful visual examination of the bank and adjacent shallow water area and periodic probing to determine if buried boat remains exist. Work in similar settings has shown that a hand-held directional magnetometer (e.g., Schonstedt) can be used to located submerged or buried metal objects that might be associated with vessel remains. Rather than actually walking the bankline, it may be more efficient to work from a small boat that is paddled or pulled along the bayou.

After the completion of the fieldwork and draft report the proposed work in Bayou Grand Caillou, including the construction of a structure or levee closure at its junction with the HNC and the dredging of approximately 6 miles of its channel, was dropped from the present project.

Research Topics

Culture History

The small collections obtained from the sites examined during the survey provide limited data for addressing questions of culture history. All of the occupations identified date to the Coles Creek or Mississippi periods. The few diagnostic ceramics recovered suggest that the Mississippi period occupations are associated with Plaquemine culture rather than a local variant of Mississippian culture. This agrees closely with the findings of the more extensive Terrebonne Marsh project sample survey carried out by CEI in the area west of the present project (Weinstein and Kelley 1992:378).

No sites examined during the present survey can be definitely associated with the Houma tribe. Part of the problem is a lack of information on Houma material culture at the time they arrived in the Terrebonne Parish area in the late eighteenth century. Bryan Guevin's (1984) research on the Grand Houmas site (16AN35) provides data on an early eighteenth century Houma occupation on the Mississippi River, but it is presently unclear how much of their native material culture the Houma retained in the late eighteenth century. It is possible that Houma occupations in the vicinity of the present project area will contain mainly Euro-American artifacts. Documentary research on Houma land ownership in Terrebonne Parish in the early nineteenth century may be needed to help identify early Houma sites in this area.

Settlement Systems

One of the questions identified in Chapter 5 concerned the association of short-term resource extraction sites with landforms other than natural levees or beach ridges. Only one portion of the present survey, the bankline survey of the HNC itself, examined both high probability landforms, such as natural levees and beach ridges, and low probability ones, such as backswamps and marshes. If we can assume that some of the small shell middens located along the HNC represent short-term resource extraction sites, then the present data suggest that even this type of site was generally located on a distributary natural levee. This is the same conclusion reached by the Terrebonne Marsh project sample survey (Weinstein and Kelley 1992:379).

The question of whether sites were established on active or relict deltaic landforms cannot be addressed using data from the present survey since intact deposits could not located at any of the sites. Data from the Terrebonne Marsh project sample survey suggested that most of the sites were associated with relict deltaic features (Weinstein and Kelley 1992:379), but this may be difficult to determine from survey level data. Regardless of whether the deltaic features were active or relict, the age of the sites examined in the present survey, the Coles Creek and Mississippi periods, agrees well with current age estimates for the Lafourche Delta complex, less than 1500 BP (Tornqvist et al. 1996).

One aspect of the settlement system on which the present study touches is the density of mound sites along some of the smaller distributaries. In this regard Bayou Sale, a relatively small relict distributary of the Lafourche delta complex, appears to be anomalous. Bayou Sale was cut by the HNC at about M.P. 15.8. West of there the distributary's natural levees are now largely subsided, yet within a 5 km stretch of the bayou are four mound sites, 16TR35, 16TR39, 16TR189 and 16TR322 (Figure 72). One of these sites, the Bayou Sale Mounds (16TR189) is a three mound group. The Four Point Bayou Mound (16TR322), if in fact it is a prehistoric feature, is located only 500 m northeast of the Bayou Sale Mounds and could have been part of a single extensive community. The next closest mound site is 16TR35, which is located about 3.5 km south of the Bayou Sale Mounds. Site 16TR39 is located about 700 m southeast of 16TR35, and, like 16TR189 and 16TR322, could have been part of a single community. The age of most of these sites is unknown. Only 16TR189 has produced diagnostic artifacts and these suggest a late Coles Creek or early Plaquemine occupation.

Historic Watercraft and Navigation

The remote-sensing survey of the five areas in the HNC Deepening Project collected relatively little data that bear directly on the research questions related to historic navigation and shipwreck archaeology posed for this study. Several shipwrecks are reported to have occurred in the vicinity of Cat Island Pass and it is known that vessels have traversed Terrebonne Bay throughout the historic period. It was for these reasons that the two offshore disposal areas and the two disposal areas behind Isle Dernier and Timbalier Island were determined to have, at least, a moderate probability of containing historic shipwrecks. The surveys of these four areas failed to discover the remains of any historic vessels. The areas examined behind Timbalier Island and Isle Dernier were quite large, and the failure to find historic wrecks in them suggests that the assessment of their shipwreck potential may have been too high. The two offshore areas surveyed were quite small and the failure to find historic shipwreck remains in them is not considered a true measure of the shipwreck potential of Cat Island Pass as a whole. As discussed in earlier chapters, several ships are known to have been lost in the area of the pass; however, the precise locations of their sinkings are unknown, meaning their discovery would require the examination of an area much larger than the two areas examined in this study.

This lack of discovery makes it impossible to develop statements on the occurrence or condition of historic shipwrecks in these areas. However, the survey did record a number of magnetic anomalies in the two offshore areas that are identified as modern trash and debris. This pattern of scattered metallic trash and debris within and immediately adjacent to modern navigation channels has been noted at many other Gulf coast locations and it seems to be a common phenomenon. While this finding has nothing to do with historic shipwreck remains, it does add to our understanding of what can be expected in remote-sensing surveys in similar settings.

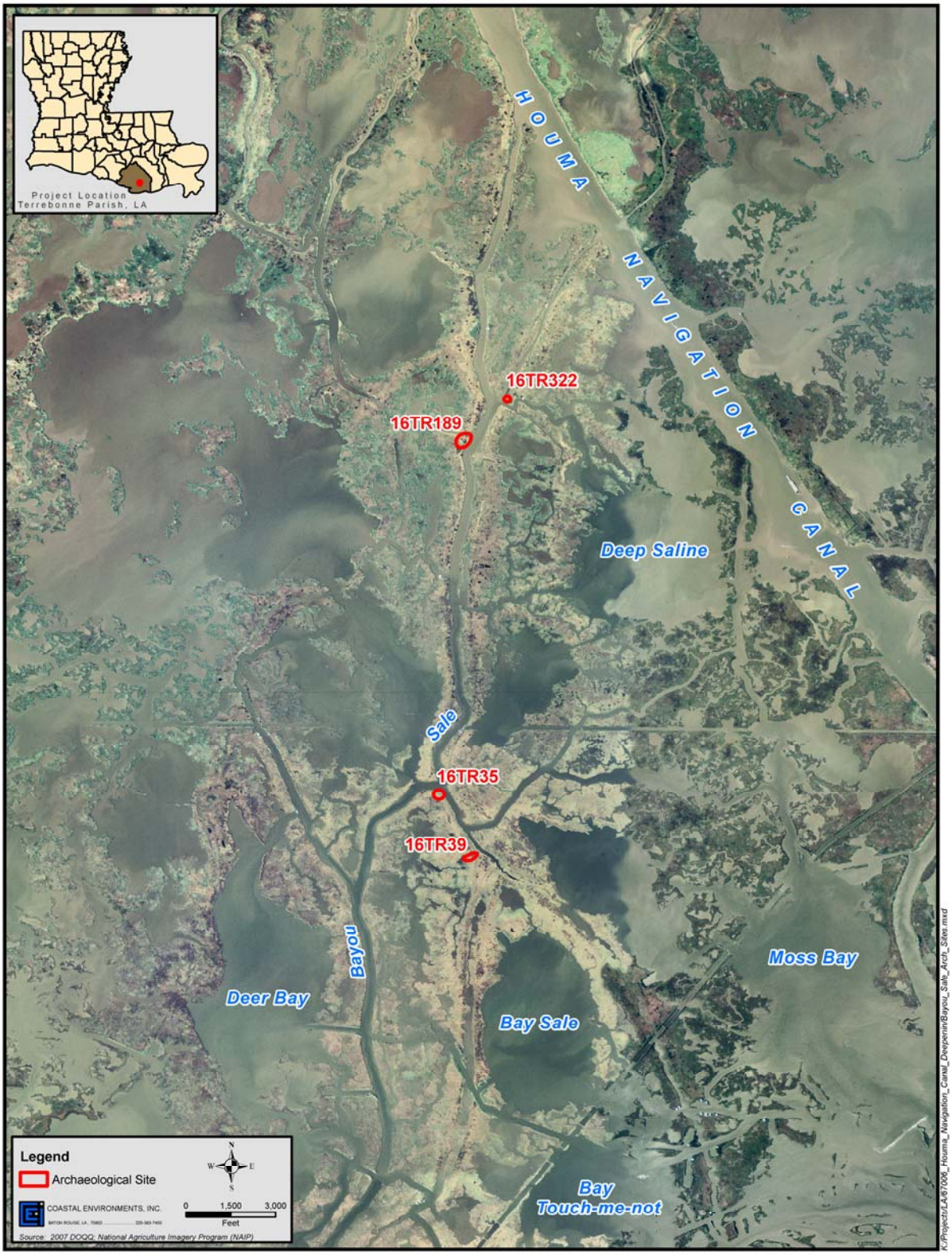

Figure 72. Mound sites located along the Bayou Sale distributary channel.

The remote-sensing survey of Bayou Grand Caillou, recorded a very large number of magnetic anomalies, many of which can be specifically correlated with modern objects, such as crab traps and pieces of modern debris. As in Cat Island Pass, this pattern can be expected along historic navigation channels where discarded or lost objects have accumulated over a long period of use. Although, it must be admitted that the number of small, low deflection magnetic anomalies recorded in Bayou Grand Caillou seems inordinately high. This might suggest that other, presently unrecognized, cultural factors are at play in this instance.

At the start of this study, it was anticipated that the remains of abandoned and derelict vessels would be found along the banks of Bayou Grand Caillou, as occurs along other similar waterways in south Louisiana where settlements and docking facilities exist. This presumption was driven by the assumption that historic settlement once existed on both sides of the bayou along, at least, the upper portions surveyed. The lack of discovery of sunken vessels in the bayou suggests that historic settlement along its banks was not as extensive as thought, nor did it extend as far back in time as believed. It may be that the several houses shown along the west bank of the bayou below Mound Bayou in the 1935 Lake Quitman 7.5 Min quadrangle (see Figure 55) represent the full extent of historic settlement along the portion of the bayou surveyed. The recommended physical examination of the bankline in the area of these houses will help clarify whether or not the association of abandoned and derelict boats with historic settlements and docks, that is so prevalent elsewhere in Louisiana, exists here.

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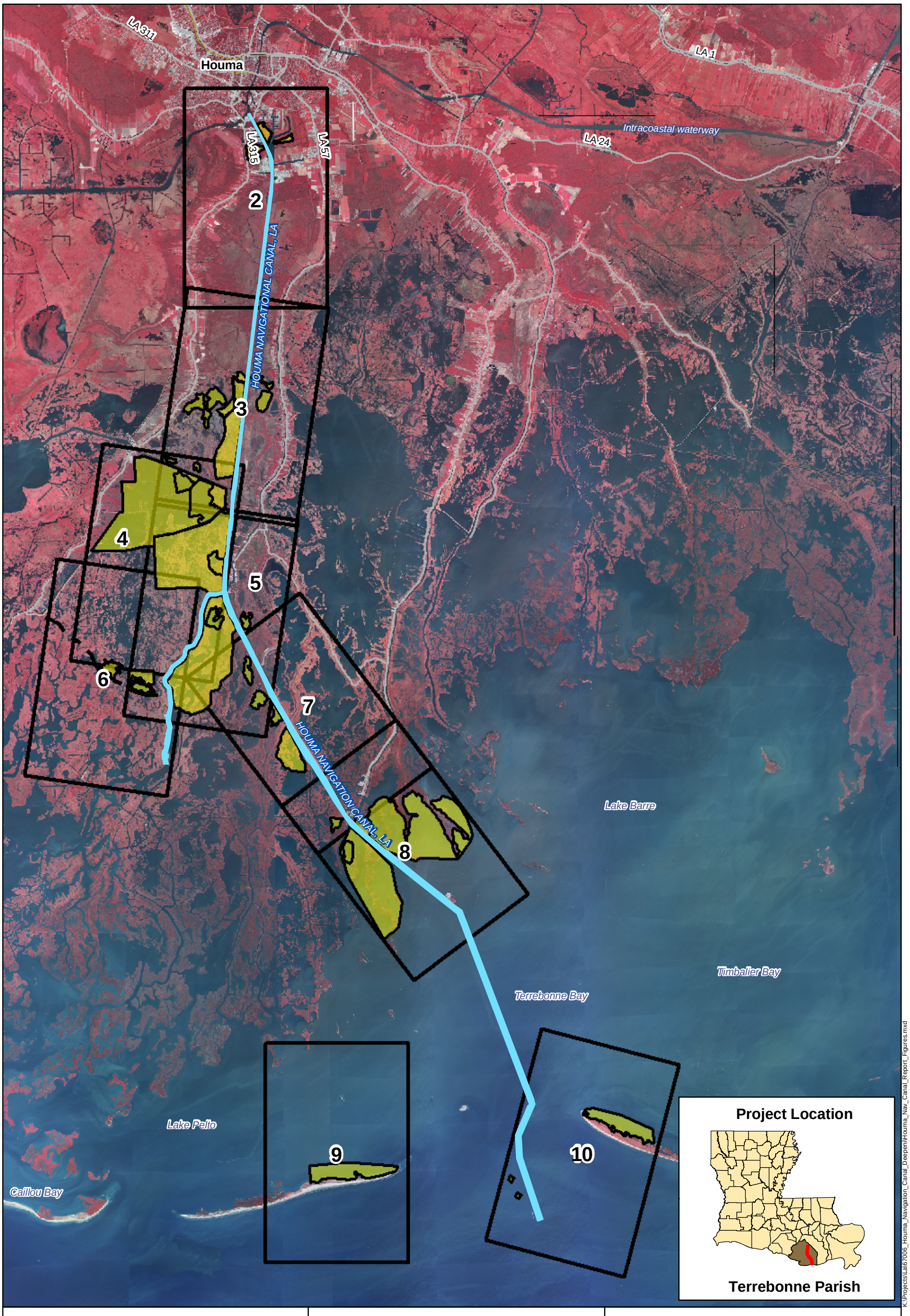

HOUMA NAVIGATION CANAL DEEPENING PROJECT

COASTAL ENVIRONMENTS, INC.
BATON ROUGE, LA., 70802 225-383-7455

Sources: 2005 USGS DOQQ

Legend

- Potential Dredging Area
- Dredged Material Disposal Area
- Map Index

Plate 1 of 10

0 2 4 6 Miles

0 5 10 Kilometers

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Intracoastal Waterway
16TR198
16TR203
Area 2
Area 1
Area 3
16TR160
Bayou Dularge
16TR312
Bayou La Carpe
16TR323
Bayou Grand Caillou

Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

COASTAL ENVIRONMENTS, INC.
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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Plate 2 of 10

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16TR313
16TR315
16TR314
16TR317
Area 13
Area 13B
16TR156
16TR89
Area 12A
Area 12
Area 14A
16TR316
Area A-07-4
Area 14
Area 16B
Bayou Grand Caillou
Area A-07-3
Area A-07-2
Falgout Canal
Area A-07-1
Area 15A
16TR2
16TR6
Falgout Canal

Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

COASTAL ENVIRONMENTS, INC.
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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Plate 3 of 10

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16TR222
16TR223
16TR306
16TR308
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16TR226
16TR227
16TR228
16TR229
16TR230
16TR231
Area A-07-3
Area A-07-2
Falgout Canal
Area A-07-1
Area 15A
Falgout Canal
Area 21B
Area 16
Bayou Grand Caillou
16TR151
16TR318
16TR22
Bayou Grand Caillou Structure or Closure
Area 19D
South Fohs Canal Land Bridge
Site B
Site C
Site A
Bayou Grand Caillou

Project Location

Terrebonne Parish

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HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Plate 4 of 10

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Area 15A
Falgout Canal
16TR2
16TR6
Area 21B
Area 16
Bayou Grand Caillou
16TR151
16TR203
16TR318
16TR22
Bayou Grand Caillou
Structure or Closure
Area 19C
Area 19D
16TR319
16TR115
16TR72
Area 26B
Area 20F
Site C
Site A
Area 20C
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Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

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Plate 5 of 10

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16TR318
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Bayou Grand Caillou
Structure or Closure
South Fohs Canal Land Bridge
Site B
Site C
Site A
Bayou Grand Caillou

Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Plate 6 of 10

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HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

Archaeological Sites
Potential Dredging Area
High Probability Areas
Dredged Material Disposal Areas
Rock Dike
Rock Foreshore Protection
Rock Retention Structure

Plate 7 of 10

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Project Location

Terrebonne Parish

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16TR320
16TR189
16TR322
Area 21
Bayou Petit Caillou
Cocodrie
Area 24
16TR12
16TR18
16TR15
16TR13
16TR14
Area 23
16TR11
Area 24A
16TR321
East Area
West Area
16TR59

Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Plate 8 of 10

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HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

- Archaeological Sites
- Potential Dredging Area
- High Probability Areas
- Dredged Material Disposal Areas
- Rock Dike
- Rock Foreshore Protection
- Rock Retention Structure

Project Location

Terrebonne Parish

Plate 9 of 10

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Project Location

Terrebonne Parish

HOUMA NAVIGATION CANAL DEEPENING PROJECT

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Sources: 2005 USGS DOQQ

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- High Probability Areas
- Dredged Material Disposal Areas
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- Rock Retention Structure

Plate 10 of 10

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Contract No. DACW29-01-D-0016
Delivery Order No. 0005

U.S. Army Corps of Engineers
New Orleans District

HOUMA NAVIGATION CANAL DEEPENING PROJECT TERREBONNE PARISH, LOUISIANA: CULTURAL RESOURCES LITERATURE SEARCH, RECORDS REVIEW AND RESEARCH DESIGN

Final Report

March 2005

Prepared by:
Coastal Environments, Inc.
Baton Rouge, Louisiana 70802

Prepared for:
U.S. Army Corps of Engineers,
New Orleans District
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12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

From October through December of 2003, Coastal Environments, Inc. (CEI), conducted a cultural resources literature search and records review as part of a U.S. Army Corps of Engineers (COE) New Orleans District re-evaluation study to determine if improvements to navigation along the Houma Navigation Canal, in Terrebonne Parish, Louisiana, are justified. These investigations are part of the planning to evaluate several alternatives to deepening the HNC from the authorized 15-foot depth to an 18- or 20-foot depth while maintaining the existing canal width. Both channel depths are being considered with a lock and without a lock in place. If the canal itself is assumed to be approximately 1000 ft (305 m) wide, the HNC encompassed roughly 4969.69 ac (2012.05 ha), including 2909.09 ac (1177.78 ha) of canal and 2060.60 ac (834.26 ha) of navigation channel.

Three previously recorded archaeological sites and 13 sunk or salvaged vessels exist within the project's Area of Potential Effects (APE). In addition, seven unrecorded sites and 23 potential site loci were noted on the HNC during the project area site inspection conducted during this study. Those portions of the project area with a high probability for containing cultural resources have been defined on project plans and encompass 691.48 ac. A research design to guide future cultural resources fieldwork in the project area is presented.

14. SUBJECT TERMS

Archaeology
Historic Archaeology
Houma
Louisiana
Prehistoric Archaeology
Terrebonne Parish
Underwater Archaeology

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HOUMA NAVIGATION CANAL DEEPENING PROJECT TERREBONNE PARISH, LOUISIANA:

CULTURAL RESOURCES LITERATURE SEARCH, RECORDS REVIEW AND RESEARCH DESIGN

By
Joanne Ryan
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ABSTRACT

From October through December of 2003, Coastal Environments, Inc. (CEI), conducted a cultural resources literature search and records review as part of a U.S. Army Corps of Engineers (COE) New Orleans District re-evaluation study to determine if improvements to navigation along the Houma Navigation Canal, in Terrebonne Parish, Louisiana, are justified. These investigations are part of the planning to evaluate several alternatives to deepening the HNC from the authorized 15-foot depth to an 18- or 20-foot depth while maintaining the existing canal width. Both channel depths are being considered with a lock and without a lock in place. If the canal itself is assumed to be approximately 1000 ft (305 m) wide, the HNC encompassed roughly 4969.69 ac (2012.05 ha), including 2909.09 ac (1177.78 ha) of canal and 2060.60 ac (834.26 ha) of navigation channel.

Three previously recorded archaeological sites and 13 sunk or salvaged vessels exist within the project's Area of Potential Effects (APE). In addition, seven unrecorded sites and 23 potential site loci were noted on the HNC during the project area site inspection conducted during this study. Those portions of the project area with a high probability for containing cultural resources have been defined on project plans and encompass 691.48 ac. A research design to guide future cultural resources fieldwork in the project area is presented.

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CHAPTER 1

INTRODUCTION

This report presents the results of a cultural resource literature and records review undertaken as part of a U.S. Army Corps of Engineers (COE) New Orleans District re-evaluation study to determine if improvements to navigation along the Houma Navigation Canal are justified. These investigations are part of the planning now underway to evaluate several alternatives to deepening the HNC from the authorized 15-foot depth to an 18- to 20-foot depth while maintaining the existing canal width. Both channel depths are being considered with and without a lock in place.

The COE is obligated under the National Historic Preservation Act (NHPA) of 1966 (particularly 36 CFR 800, the regulations governing Section 106), and the National Environmental Policy Act (NEPA) to take into account the effect its undertakings have upon cultural resources within a given project area. Under these laws and regulations, the COE assumes responsibility for the identification and evaluation of all cultural resources within the project boundaries.

The Houma Navigation Canal (HNC) is a Federally maintained waterway beginning at the Gulf Intracoastal Waterway at Houma, Louisiana and ending about 41 mi (65.96 km) south of Houma at the minus-18-foot contour in the Gulf of Mexico navigation channel at Cat Island Pass (Figure 1-1). Construction of the HNC began in 1958, and the official opening was in June 1962. The proposed project area contains approximately 24 mi (38.61 km) of canal and 17 mi (27.35 km) of navigation channel. This cultural resources investigation evaluates and assesses the potential for cultural resources in the proposed project area, which includes new and existing upland disposal areas, submerged disposal areas, earthen dike and access road locations, marsh restoration areas, and rock retention structures and foreshore protection dikes along the canal. If the canal itself is assumed to be approximately 1000 ft (305 m) wide, the HNC encompassed roughly 4969.69 ac (2012.05 ha), including 2909.09 ac (1177.78 ha) of canal and 2060.60 ac (834.26 ha) of navigation channel.

The HNC serves as a navigation route connecting the Gulf of Mexico with the interior of the central coast of Louisiana. It cuts through several natural waterways including Bayous Black, La Carpe, du Large, Petit and Grand Caillou, Sale, and Little Cocodrie Bayou, most of which empty into Terrebonne Bay. All these bayous were regionally important water routes leading inland from the Gulf through the prehistoric and historic periods. Thus the probability for finding archaeological sites, historic standing structures, and shipwrecks along their banks is considered high. Several archaeological and shipwreck sites are known to exist in the general project area, and unreported sites likely exist.

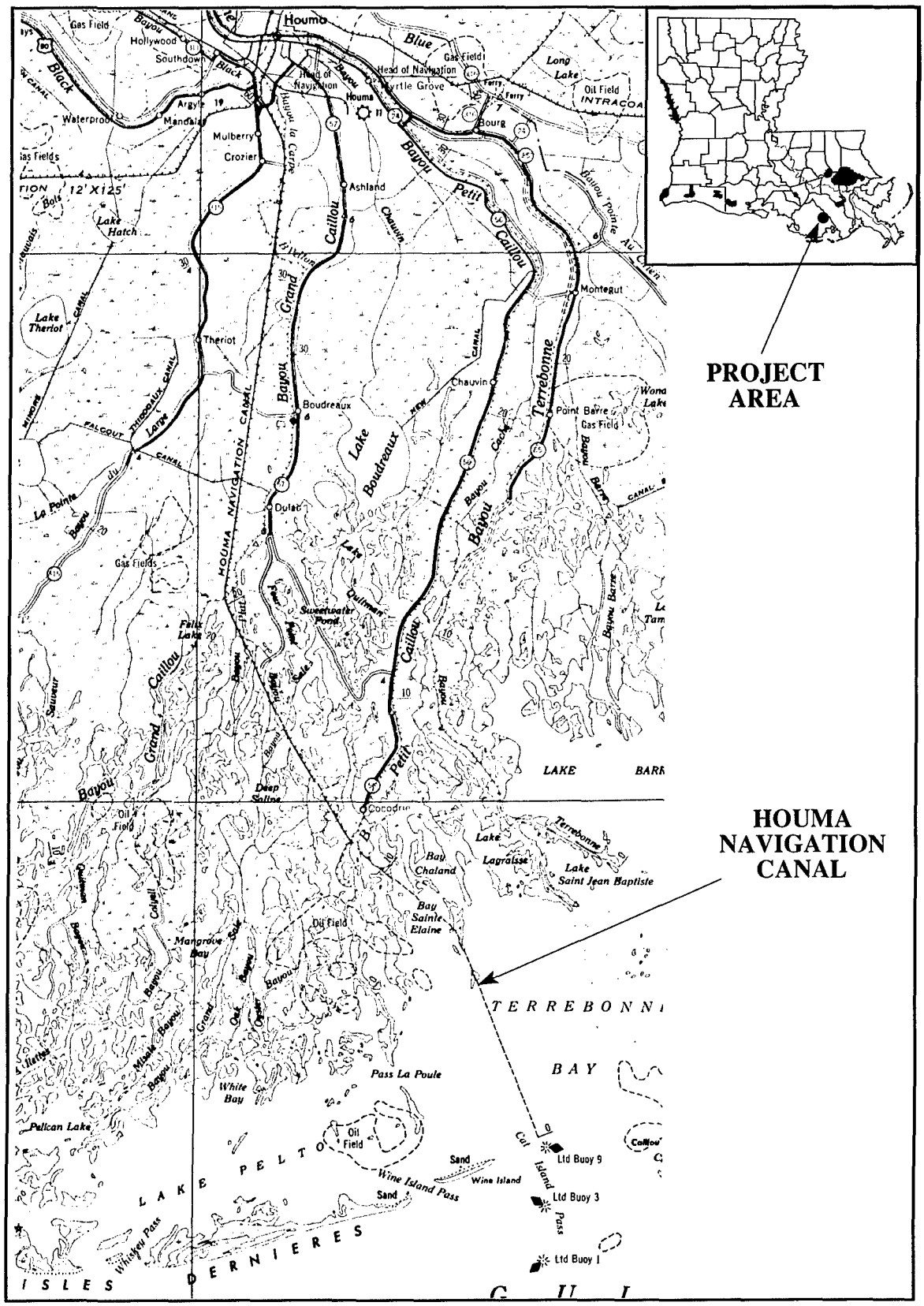


Figure 1-1. The location of the Houma Navigation Canal project area.

The data developed in this study provide the New Orleans District with knowledge of the cultural resources potential of the project area. In addition, it is hoped that the information provided here will serve as a contribution to the broader area of the District's overall management of cultural resources. This study also provides a contribution to the body of literature dealing with the history and prehistory of Terrebonne Parish and the Louisiana Gulf coast. So little comprehensive survey has been conducted in the region that all new data collected will inevitably be of great value. Unfortunately, the sites that can provide this data are disappearing at an alarming rate, given the degree of land loss in the region over the last 50 years. If the information is not garnered now, it might never be.

This report is organized as follows. Chapter 2 discusses the geological setting of the project area, while Chapter 3 details the previous archaeological investigations conducted there in the nineteenth and twentieth centuries. A brief summary of aboriginal occupation along the HNC is presented in Chapter 4, and subsequent historic occupation in Chapter 5. Chapter 6 presents the results of a cultural resources records review and a reconnaissance inspection conducted of the project area. All of this preceding data were then used to produce a research design for the proposed project area that is presented in Chapter 7.

CHAPTER 2

ENVIRONMENTAL SETTING

The study area lies within the Mississippi River deltaic plain of south central Louisiana. The delta plain includes the lower portion of the present Mississippi River, its present delta, and areas occupied by former deltaic systems of the river. This is an area characterized by both fluvial and deltaic features, such as natural levees; abandoned and relict distributaries; interdistributary basins, vast areas of saline, brackish and fresh marshes; large saline and brackish bays; and coastal lakes, beach ridges and barrier islands. The primary streams in the project vicinity include Bayou Black, Bayou La Carpe, Bayou du Large, Bayous Petit and Grand Caillou, Bayou Sale, Little Cocodrie Bayou, and Bayou Terrebonne. The six latter watercourses empty into Terrebonne Bay. The dynamic nature of this deltaic environment placed considerable constraints on the timing, distribution, and functional nature of human habitation. The following discussion focuses on those aspects of the environment most critical to understanding human adaptation to the area over time.

Geology

The Mississippi River delta plain is a massive wedge of alluvial and deltaic sediments extending for almost 320 km miles along the coast of Louisiana and over 100 km inland. Its geologic history is related to a sequence of episodes of delta building and deterioration resulting from the progradation and subsequent abandonment of the present and former Mississippi River courses and deltas over the past 9,000 years or so. Thus, the Mississippi delta plain is a composite geomorphic feature consisting of numerous coalesced delta complexes which themselves are composed of numerous smaller units, commonly referred to as delta lobes. The surface morphology of each delta plain and lobe is similar, consisting of a network of distributaries that radiate out from an abandoned or active trunk channel and are separated by interdistributary troughs consisting of vast areas of marsh, swamp, ponds and lakes.

Between about 9,000 years ago and the present, the Mississippi River built several delta complexes, each consisting of several delta lobes. The delta complexes represent major shifts in the course of the Mississippi River. Drawing from Frazier's (1967) earlier work, and relying on recent archaeological data, Weinstein and Gagliano (1985:Fig. 1) have identified the following major delta complexes from oldest to youngest: Maringouin, Teche, Metairie, LaLoutre (St. Bernard), Lafourche-Terrebonne, Plaquemines and Belize, the modern delta complex (Figure 2-1).

The advance or retreat of shorelines is caused by the change in balance between rates of sediment deposition and effects of subsidence and erosion by the sea. Deltas and shorelines advance at the mouths

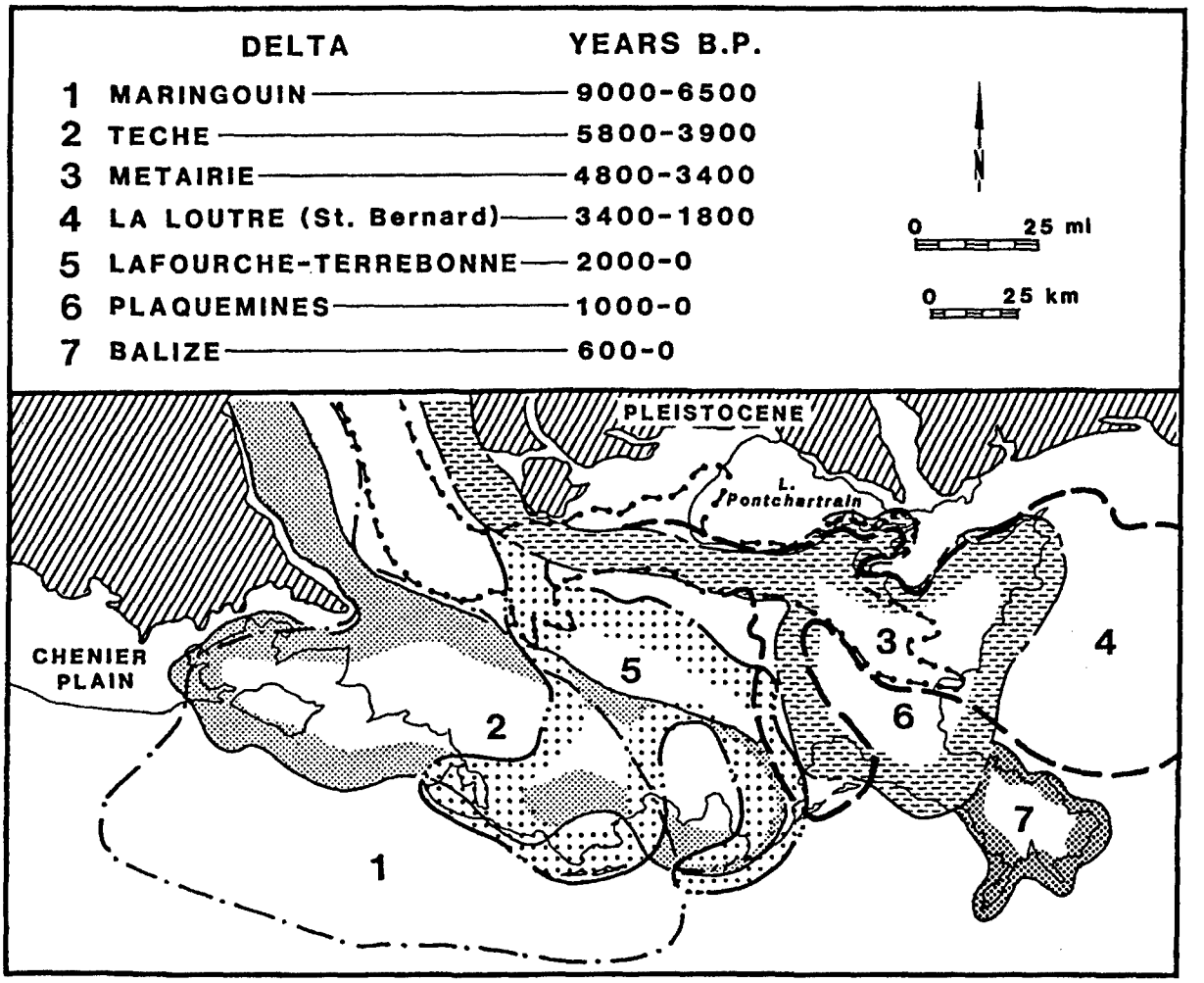


Figure 2-1. Mississippi River deltaic complexes (Weinstein and Gagliano 1985:Fig. 1).

of active streams that transport sediments seaward. Erosion occurs near the mouths of inactive streams that cannot transport sufficient sediment to sustain their position (Gagliano et al. 1975:9-15). Barrier islands are formed along delta margins as a delta lobe goes through deterioration after abandonment. As a delta lobe is abandoned and the deltaic surface begins to submerge through subsidence, the sand deposits that had been distributed along the delta margin often remain as a series of barrier beaches or barrier islands, separated from the retreating delta shoreline by a shallow bay or estuary (Williams et al. 1992). With continued subsidence, the barrier sediments become subject to redistribution, characterized by an inland migration of the island coupled with loss of sediment and a decrease in the size of individual islands.

The Houma Navigation Canal project area is associated with the abandoned Lafourche-Terrebonne delta complex (see Figure 2-1) and the barrier systems of the Timbalier Islands and the Isles Dernieries represent the islands formed as the delta complex has retreated. The most recent geological evidence indicates that Lafourche-Terrebonne delta complex began as a distributary (present day Bayou Lafourche) off the main trunk of the Mississippi River approximately 1500 years ago (Tornquist et al. 1996). This date is later than that proposed by earlier geological studies, but is in line with currently available archaeological data from the Lafourche-Terrebonne region (Pearson and Davis 1995; Weinstein and Kelley 1992). Possibly after only 500 years or so of progradation, flow into the Lafourche-Terrebonne system from the main trunk of the Mississippi River began to decrease and, soon, the system began to deteriorate. Bayous Petit Caillou and Terrebonne, which empty into Terrebonne Bay, constitute two now-relict channels that were components the Lafourche-Terrebonne system. As the margins of

the delta began to erode back, barrier islands were formed. The Timbalier Islands were created over only the last 300 years as erosion from the Caminada-Moreau Headland at the mouth of Bayou Lafourche supplied sand for barrier development. Landforms developed into continuous duned terraces and spits on the downdrift ends of the islands. The Timbalier Islands are, therefore, "laterally-migrating, flanking barrier islands built by recurved spit processes" (Williams et al. 1992:4). The Isles Dernieries are older and were formed by the erosion of the Bayou Petit Caillou headland and beach ridges over the last 600 to 800 years (Williams et al. 1992:4).

In a survey report examining Bayou Terrebonne in 1880, it was noted that the mouth of Bayou Petit Caillou had previously been at Caillou Island, well seaward of the mouth at that time. It was noted that in 1850 the bayou ran between narrow strips of sea marsh between Timbalier Bay and Terrebonne Bay. By the time of the survey in 1880, this area of marsh had broken up into isolated grass islands by the action of waves (Annual Report of the Chief of Engineers [hereafter cited ARCE] 1880:1180). Trips from Montegut to Caillou Island by land were common at one time and there was a lighthouse and even a hotel on the island (Guidry 1985:37). However, the processes of subsidence and erosion are continuing and more and more fast lands are being eroded and the form and content of the barrier islands are constantly changing as well as being removed. This trend of beach erosion along the barrier islands in Terrebonne and Lafourche parishes has been recorded in a comparative study by Williams et al. (1992). For example, Wine Island, extant in 1887, is now almost completely gone. Its remnants are primarily exposed during periods of low water. The Wine Island entrance pass was situated slightly east of where Cat Island Pass is today. Cat Island Pass is a shallow water pass extending between the Timbalier Islands and what remains of Wine Island, historically part of the Isles Dernieries (Last Islands). Both passes connected the Gulf with the western end of Terrebonne Bay.

Geomorphology

The landforms located at or near the surface within the study area have been formed by deltaic activity within the past 9,000 years (Fisk 1952; Frazier 1967). The earliest episode of delta building occurred between about 9000 and 6500 years ago when sea level was 40 to 60 ft below its present elevation. This delta, known as the Maringouin, once extended 40 to 50 mi beyond the present shoreline, but with subsequent sea level rise it was transgressed and gradually eroded back (see Figure 2-1). Much of the onshore remnant of the Maringouin Delta is now deeply buried beneath later deltaic deposits; however, Weinstein and Gagliano (1985:122) have suggested that a relict beach ridge partially exposed west of Lake Penchant may represent a reworked portion of the early delta. Other researchers have argued that this feature is associated with the next stage of delta building and is therefore substantially younger (Smith et al. 1986:64).

By about 5800 years ago sea level had risen to approximately its present level, and the Mississippi began prograding a new delta, known as the Teche, into the shallow Gulf. The trunk channel of this system has been reoccupied by bayous Teche, Boeuf, L'Ourse, and Black. Its natural levees, composed of grayish brown silts and silty clays, have subsided somewhat, but are still extant as surface exposures approximately half a mile to one mile wide.

While the age and content of the Teche Delta are known in general terms, questions remain concerning the period during which it was active within the present study area and the location of its eastern limits. Smith et al. (1986:61-62) suggest that deposition in the Terrebonne marsh area occurred between 4500 and 3500 years ago, and that the easternmost deposits are found in the vicinity of Houma. Weinstein and Gagliano (1985:123) argue for a somewhat earlier period of activity, 5800 to 3900 B.P., and, following previous researchers such as Russell (1940:1203) and Fisk (1944), place the eastern margin of the Teche Delta approximately 30 mi east of Houma. They identify several southwest trending distributaries including Bayou du Large, Bayou Mauvais Bois and Small Bayou La Point, as having been initially formed by the Teche Delta. Smith and his co-authors (1986:64-67) assign these to a later episode of delta building.

About 4800 years ago the Mississippi River began shifting out of the Teche course and creating a new delta in the area of present-day New Orleans. Variously known as the Cocodrie (Fisk 1944), Metairie (Weinstein and Gagliano 1985), or an early stage of the St. Bernard Delta (Frazier 1967), it initially received only partial flow as a portion of the Mississippi's discharge continued down the Teche, building new distributaries now occupied by bayous Sale and Cypremort. As the Mississippi's flow gradually shifted to the east, the Red River, which

had intersected the Mississippi south of the Marksville Prairie, occupied the old Teche course and discharged directly into the Gulf through its distributaries. Several authors have commented on the narrow and relatively steep Red River natural levees which may be seen within the broad, gray levees of the Teche-Mississippi (Landreth in Newton 1985:111; Russell 1940:1205).

The duration of the Red's occupation of the Teche course is not well established at present. Russ (1975:163-166) suggests that the Red followed the Teche course only a short time after the Mississippi abandoned it. He argues that the Red then shifted into a new meander belt, occupied it for a time, and then abandoned it in favor of the Teche course once again. Unfortunately, Russ has no absolute dates for any of these events. Archaeological data from two widely separated localities bear on this problem. One of the localities is the Gibson site (16TR5), located west of the present study area. McIntire (1958:63-64) took several cores from the site and encountered a Marksville-age shell midden intermixed with reddish silts that he interpreted as Red River deposits. Based on these findings, McIntire suggested that the Red was still occupying the Teche course at the time that the midden was deposited (ca. A.D. 1 to 400). The other piece of archaeological evidence comes from the modern Red River meander belt through Moncla Gap. Previous researchers have generally placed the age of this meander belt at less than 1,000 years (Fisk 1944; Saucier 1974:Fig. 3), but Pearson (1986) has recently noted that the apparent association of several early Marksville sites with this feature argues for a considerably earlier date of establishment, on the order of A.D. 1 to 200. Thus two sets of archaeological data suggest that the Red River abandoned the Teche course about 1800 to 1900 years ago.

While the Red River continued to occupy the Teche course, the Mississippi began diverting out of the St. Bernard Delta and gradually shifted its flow down Bayou Lafourche. The Lafourche system reached its peak flow about 2000 years ago, creating new delta lobes east of the present study area and reoccupying old Teche distributaries such as Bayou Black and Bayou L'Ourse.

About 1000 years ago the Mississippi River again began shifting its course to the eastern portion of the deltaic plain and building the Plaquemines Delta. A small amount of flow continued down the Lafourche system, but this was probably not responsible for any significant land formation within the present study area. This diminished flow continued until 1904 when the source of Bayou Lafourche was artificially closed. After about 1000 B.P. subsidence and marine transgression became the dominant processes at work within the Terrebonne marsh. Only within the last 50 years, since the Mississippi's diversion of a portion of its flow down the Atchafalaya River, has sedimentation begun to occur to the west of the study area.

Depositional Environments

The complex geomorphic history of the study area has resulted in an intricate and constantly changing mosaic of environmental zones. Recent human activities have, in some cases, dramatically altered the condition of these environmental zones (e.g. the clearing of forests from natural levees), and in other cases they have accelerated the change from one environmental type to another (e.g. the shift from fresh to brackish marsh). The study of depositional environments has proven an effective method of reconstructing environmental zones of the past. Depositional environments can generally be identified from maps or remote imagery, and a recent study (Smith et al. 1986) has delineated those at or near the surface within the present area. Depositional environments also often have distinctive lithological characteristics that can be identified in subsurface borings and excavations. These environments can likewise be dated by a variety of relative and absolute dating techniques.

One group of depositional environments found within the present study area consists of a series of fluvial features which include natural levees, point bars, abandoned channels, abandoned courses, and distributary channels (Smith et al. 1986:10-16). Natural levees are ridges formed through vertical accretion as a result of overbank flooding along a stream. They parallel the channel and slope away from it. The natural levees presently exposed within the study area vary from over 1 mi wide along the trunk channel of the Teche-Mississippi course to only a few feet wide along some of the smaller distributaries. Their crests range in elevation from 10 ft to approximately sea level. Natural levees are presently exposed in parts of the study area, but they also occur in the shallow subsurface, having been buried by subsidence beneath more recent swamp and marsh deposits.

Point bars are lateral accretion deposits that form on the inside bank of meandering streams. They exhibit a fining upward sequence of grain sizes and a characteristic ridge-and-swale topography. Point-bar deposits are limited to the trunk channel of the Teche-Mississippi system, and are therefore a minor depositional environment in the present study area.

Abandoned channels and abandoned courses are both relict stream channels. Smith et al. (1986:11-13) distinguish between the two primarily on the basis of length and the fact that a course is abandoned in favor of a new meander belt. In this study the two are combined and referred to as abandoned channels. Although abandoned by the river, these channels are often reoccupied by smaller streams and may continue to contain open water for a considerable period of time. They gradually fill with fine-grained deposits interbedded with organics.

Distributary channels are simply small stream channels that diverge from the trunk channel of a deltaic system. Like the larger channels of the delta, they have associated natural levees, but these have often subsided completely beneath the marsh.

Other depositional environments found within the study area include inland swamps, marshes, lakes, and interdistributary bays. Inland swamps are poorly drained areas bordered by natural levees that support swamp-forest communities. Presently they are limited to the northern and western portions of the study area, but their distribution has changed over time with the expansion and deterioration of the delta lobes.

Marshes make up the majority of the land presently exposed within the study area. They support vegetation composed predominantly of grasses and range in salinity from fresh to brackish to saline. The three marsh types vary in elevation, ratio of organics to inorganics, and associated plant species, and can sometimes be distinguished in the subsurface through a combination of sedimentological and botanical analyses. They are presently distributed in a series of roughly east-west trending bands across the study area, but, like the inland swamps, their distribution has changed considerably through time.

The final depostional environments present are lakes and interdistributary bays— bodies of open water that may form during progradation of a delta or after it has begun to deteriorate. They often differ in salinity, but both fill with fine-grained deposits.

Modern Setting

The present conditions affecting the study area are an ongoing part of the evolution of the Lafourche-Terrebonne delta system. The bayous running through the project area were used historically to connect the inland port community of Houma and other smaller communities, plantations and farms with the Gulf. While these bayous continue to be used by recreational and some commercial traffic (primarily shrimp and fishing boats), much of the commercial traffic now travels along several navigation canals constructed in this century.

Louisiana now leads the nation in the loss of its wetlands and in coastal erosion. Erosion of its barrier islands, in places, exceeds 20 meters per year. The state's barrier islands have decreased by more than 40 per cent on the average and some islands have lost 75 per cent of their areas within the past 100 years. As the barrier islands dissipate, so does the protection from erosion they provide to inland wetlands. The Isles Dernieries, for example, have the highest rate of coastal erosion in the state. Between 1890 and 1988 most of the central arc of Whiskey Island had eroded, as well as a large portion of Wine Island (Williams et al. 1992:2). This trend of land loss is expected to continue for years to come. The physical processes that cause the erosion are complex, and there is much debate and controversy within the technical and academic community over which cause is the most significant and which measures would alleviate coastal land loss (Williams et al. 1992:1). Most agree that the erosion is both natural and human induced, and greatly affects the movement of sediments that both bury and expose cultural resources.

CHAPTER 3

PREVIOUS INVESTIGATIONS

This section will provide data on previous investigations pertinent to the archeology of the area, particularly the lower Atchafalaya Basin and adjacent marshes. As much of this information has been presented previously (Brown et al. 1997, 2000; Gibson 1979; Goodwin et al. 1985a; Neuman 1977, 1984; Weinstein 1994; Weinstein et al. 1978; Weinstein and Kelley 1992), only a brief synopsis is provided.

Nineteenth Century

The earliest reference to potential archeological sites located in the project vicinity, is the term "Temple" shown on a map entitled *Carte Generale du Territoire d'Orleans* by Barthelemy Lafon and dated 1806. This temple presumably represents a prominent Indian mound and is located at what is apparently the southeastern end of Lake Palourde north of Morgan City. However, the geography of the region is somewhat confused, making an absolute location difficult to discern. If the temple is in the position suggested, then it likely refers to the Lake Palourde site (16AS14), reportedly a large shell midden situated at the junction of the lake and bayous Boeuf and L'Ourse.

The next set of references to sites in the region comes from James Leander Cathcart and John Landreth, commissioned by the U.S. Navy in November, 1818, as agent and surveyor, respectively, to locate stands of live oak and red cedar trees for construction of naval vessels (Prichard et al. 1945:735-736). Along with fellow agent James Hutton, and a crew of seven men, Cathcart and Landreth spent approximately three months (January through March 1819) travelling throughout the Atchafalaya Basin, up and down Bayou Teche, and along the Louisiana coast between Belle Isle and Bayou Petit Caillou. Both men left journals of their expedition. Cathcart's was edited and published in 1945 by Walter Prichard, Fred B. Kniffen, and Clair A. Brown (Prichard et al. 1945). Landreth's account has been presented twice within recent years; first by Dennis A. Gibson in a series of five installments in the *Attakapas Gazette* single volume (Newton 1985). Cathcart was the apparent leader of the party and it is interesting to note that he used Lafon's earlier map as a guide (Prichard et al. 1945:760).

On January 23, 1819, the expedition reached the southeastern corner of Lake Palourde, the junction of the lake, Bayou Boeuf and Bayou L'Ourse (Prichard et al. 1945:788-90). That portion of Bayou Boeuf which runs roughly north-south (connecting Lake Palourde and the present-day Gulf Intracoastal Waterway) was then referred to as "La Coup." It was near the entrance to La Coup that Cathcart first detailed an Indian site within the general study area. This site, today known as the La Coup site (16SMY146), is located on the extreme northeast-

ern edge of Tiger Island and immediately across Bayou Boeuf from the Lake Palourde site (16AS14). Cathcart described it as follows:

> At the mouth of LaCoup, the land tends N by E along Lafourche Island; Tiger Island, and Lafourche Island points, bear N and S of each other. The West side of Tiger Island ranges SW 1/2 S, to West about 5 miles; in this bearing LaCoup is bounded by Tiger Island on the South and Lafourche Island on the North; We landed at a white mans house on Tiger Island where LaCoup is from 80 to 100 yards wide, there is likewise a house on Lafourche Isle opposite to it, own'd by one Garrett Taylor from Ouachita - Pierre Moreaux at whose house we landed is a sailor, a native of old France, & is about 60 years old, his wife is a native of Bedford County Pennsylvania, about 33 & has two children the youngest a fine fat boy of a year old, their house is fix'd on a hill of clam shells, which bounds an Indian burial ground, from whence they frequently dig human bones, once they found a whole skeleton; behind the hill is a piece of good alluvial land; as low as the surface of the water, the soil appears rich & produces red maize, cabbage, garlic, beans, & sweet potatoes - they have some poultry, & what I thought a curiosity, their dog which was very tame, eat corn with them in perfect harmony, picking the grain from the Cob with his teeth, & generously permitting an old hen to pick up all that fell on the ground . . . [Prichard et al. 1945:789-790].

Landreth's description of the locale is almost identical:

> . . . here on Tiger Island near the mouth of the coup or cut is a small settlement in possession of Peter Muro a Frenchman formerly a sailor is about sixty years of age. has a wife about thirty years of age and two children a Boy and Girl quite small the wife a native of Pennsylvania her maiden name Donnelly they have lived here some years and from account enjoyed good health Muro has in cultivation about six acres which supplies the family with Bread and wholesomeRoots and plenty of garden vegitables the old man appears to be industrious he has got some Peach Trees Planted which appears very thriving he was this Day planting sweet Potatoes his Peas was about fit to . . . Blossom his onions and garlic 6 inches high everything looked in a very growing way. their House or rather miserable Hut stands on the Top of a high bank of Shells near the side of the cut the Lands as they extend back from the cut flls very low but are a rich black Soil and very productive. here we got a supply of fresh water tolerably good [Newton 1985:63].

Leaving the Moreaux family, Cathcart and party descended Bayou Boeuf and casually mentioned "several plantations tolerably well fenced" (Prichard et al. 1945:790) situated along its banks. One structure situated along the "last reach" of La Coup was "a good plaster'd house, full as good as any of the houses at Franklin, with several outhouses, which make a neat and comfortable appearance . . ." (Prichard et al. 1945:790). This may have been a forerunner of the Hard Times Plantation (or Thibodaux) house (16AS34), reportedly built in 1832 by George Schwing who had previously settled along Bayou Boeuf (Stahls 1976:82-83; Weinstein et al. 1978:31-33).

Turning west with Bayou Boeuf near the present location of Amelia, the Cathcart expedition proceeded west toward Berwick Bay. After crossing the bay, the party stopped at Berwick Plantation where today the town of Berwick is situated. It is there that both Cathcart and Landreth describe what certainly must have been an impressive array of Indian mounds and shell middens.

Cathcart records the mounds and middens in unusually fine detail:

> On Mr. Berwicks place are four Indian Mounds, which are a natural curiosity, the origin of which is veil'd by the lapse of time, they are situated at right angles, pointing to four Cardinal points, including a square of about an Acre, in which about 30 years ago, there were several strata of ashes very visible, supposed to have accumulated from the council fires of the aborigines . . .
>
> The bank of the river behind which these mounds are situated, is ten feet high, composed of Clam shells, on the fish which, it is supposed they fed - The two which point on the bay, are about 250 yards apart - the Southernmost, which is the highest, is about 30 feet above the surface of its base, which is level with the water, its parallel companion, is not so large, but they are all of the same figure, which is the frustrum of a Pyramid, of 60 yards, each side at the base de-

creasing, until at the summit, they are not more than 30, forming an ascent rather difficult . . .

On the North sides of the two Southern, & south sides of the Northern ones are gangways form'd by which to ascent; at the base of the southwestern mound, is a large pool of water, & on the top of the Northeasternmost is a large heap of ashes, which have been dug into, a small distance, but no discovery has been made, it is supposed to be the Altar on which they offer'd up sacrifice, where even human victims may have been immolated at the shrine of the offended Deity of the waters . . .

It is conjectured that these mounds were erected at some remote period as a place of retreat from the inundation of the Mississippi; this may have been the case, combined with a place of defense when attack'd by superior numbers, it is likewise probable that the waters might have risen far above their expectation, & overwhelm'd them at their last reterat, & not even left a vestage of their existence; or that the lapse of time has been so great, since they were erected that it has buried the tradition with its depositories in the gulf of oblivion . . .

To reconcile these opinions, it is necessary to examine the interior of the mounds, in which with the exception of a small space on the Northeastern Altar, & on the Southeastern, where Mr. Berwick's mother is inter'd, they have remain'd undisturbed for ages; were it not for their great magnitude, they might be supposed to be the repository of the bones of innumerable bodies of Indians, who died in battle, or by pestilence, & annually accumulated by natural deaths, which at different periods have been cover'd with Stratas of earth, but their vast size & regular form, is opposed to this opinion, we must therefore remain in comparative ignorance, until this curious work of the Sons of forest, is explored to its base . . .

It is worthy of remark, that many human bones have been dug up, on Mr. Berwicks plantation, in the vicinity of the mounds, while they have remained undisturb'd . . . [Prichard et al. 1945:793-795].

The fact that Cathcart was able to observe the "gangways" and "pool" (borrow pit) attests to the fine state of preservation of the mounds in 1819. Landreth provides a somewhat different description:

. . . now in Berwicks Bay we steer West Northwest three quarters of a mile to a settlement owned by a Mr. Berwick from whose Ancestors Berwicks Bay took its name here at Mr. Berwicks we went on shore and examined some Indian Mounds as they are called. there is four of these mounds in number which are evidently works of art and apparently much labour has been spent upon them the four forms nearly a square :: at about the distance of sixty yards apart. there being no record or tradition of the Origin or cause of the raising of these mounds the mind is left to conjecture. when how and for what purpose they originally were raised. the Lands on which these mounds stands are very low and being all alluvion werre no doubt much lower formerly than they are at present and more subject to inundations these mounds might therefore be raised as places of retreat during the overflowing of the waters they have also the appearance of places of security in time of war. the most [illegible] of which Mr. Berwick has converted into a Burying ground and has their laid his mother the figure of this mound appears to be a perfect cone and perpendicular height about one hundred feet. the top or smaller diameter being about one hundred and twenty feet. we staid but a short time on shore got some organges of Mr. Berwick and soon went on board of our Boat again and stood up the Atchafalaya or Berwicks Bay North North West two miles to the mouth of the Teche . . . [Newton 1985:66]

In an earlier study, Weinstein et al. (1978) suggested that these mounds were equivalent to at least one which used to stand on Fairview Plantation property slightly to the north of present-day Berwick. It now appears that this suggestion was in error, and that the mound on Fairview Plantation and those on Berwick's place were two separate sites.

After exploring the environs around Berwick Bay, Cathcart and company headed south down the Atchafalaya River. After passing the southern end of Bayou Shaffer, Cathcart reported the following:

Steer'd SSW 1/2, WSW 1, SSW 1 mile to Meridian, bent a fishing line on to lead line, & got bottom in 8 fathoms, S by E to S 1/2 E 2 miles to shell Island . . . on which is a clump of live oak, of a low shrubby groth, which is the first we have seen since the marsh commenced,

> at 1 1/2 PM it bore WSW & may be known by a white shelly or sandy beach . . . [Prichard et al. 1945:798].

This same location was recorded by Landreth in the following manner:

> . . . this two miles brings us to a Small Island on our right containing about two acres of Land apparently made up of a mass of Shells mixed with a little Earth covered with a handsome growth of small young Live Oak; this place we call Shell Island; which has a very handsome appearance being pretty high and a handsome shell beach on one side washed by the Broad deep waters of the Atchafalaya and rising like an artificial mound out of the Low Surrounding marsh who's summit is adorned with beautiful Live Oak and it margin generally covered with aquatic Fowls [Newton 1985:75].

This "Shell Island" is today known as Shell Island Point and is the locus of a large prehistoric shell midden (16SMY25) of the same name. Leaving Shell Island Point, Cathcart and his party headed towards Deer Island, in the center of which was a large, prominent stand of oaks growing on a shell ridge (Prichard et al. 1945:798-799; Newton 1985:75-76). Today known as the Deer Island site (16TR88/103), Cathcart (Prichard et al. 1945:798-799) described it as follows:

> . . . from Shell Island [Shell Island Point, 16 SMY 25] to the point, which we must pass (SW point of the marsh) to go to Deer Island, on which were a prodigious number of Pelicans, is S by W dist. 3 miles: At 2PM, the wind was WSW right in from the Gulf which made a considerable swell; the first points (Deer & Presidents points) . . . going out of the Atchafalaia bears W by N & E by S of each other dist'ce 3 Miles, at the mouth of the river close along shore there is from 3 to 4 feet water; we kept along the point SE 1/2S & bore away into Deer creek [Round Bayou on modern maps], . . . which divides Deer from Plumb Islands NE by N; it is bounded by grassy marsh on both sides, a crooked Bayou runs through it, about 100 yards from the 1st point, which we did not enter, supposing there was not water in it for our boat; the course kept winding from NE by N to North 1 1/4 miles enter'd another creek [Deer Island Pass] N'th 50 yards & then another [a ditch, according to Landreth], just the breadth of the boat, which runs W by S 250 yards where we landed on the Cane marsh close to the shore; the soil was rich alluvion, full of Deer tracks, much rooted up by them & Racoons; here an Owl was shot, who hail'd us on our arrival, although it was daylight, this I must allow was ungrateful, but I have received returns for favours confer'd; sentimentally as bad as death! from the Lords of the creation Man! & I had no agency in the murder of this emblem of wisdom, & would much rather it had lived–

> We found a ridge of live oak on this Island 100 yards wide, & more . . . than half a mile long, which contained about 100 trees, a few of which were 3 to 5 feet diam'r, but the Island is entirely surrounded by marsh, which would render the transportation of timber very difficult & expensive, even if a sufficient quantity existed to render it an object worthy of attention of government. On this Island no mark of the axe appears, it is in a perfect state of nature, its groth is wild cherry (Cerasus virginiana) . . . honey locust (Gleditchia triancanthos) maple (acer rubrum) & live oak underwood, Canes, Briars, vines and small shrubs; common to all the Islands which we have visited, & which is already described; we likewise found wild onions or shallots, . . . which has just commenced vegetation, & had not yet form'd bulbs, of which we pick'd a quantity an excellent anti-scorbutic, & no bad auxiliary to salt beef and biscuit–

> Deeming the groth of this Island of little importance for naval purposes, [this conflicts with Landreth's account, see below], we ran out into the bay . . .

Landreth (Newton 1985:75-76) reports the following:

> from Shell Island [Shell Island Point, 16SMY25] South west three miles to the south westernmost point of Deer Island to the mouth of a Bayou (Round Bayou on modern maps) which divides Deer from Plumb Island the mouth of which Bayou is about forty yards wide into which Bayou we steer North East by North half a mile in nine feet water. thence North by East half a mile to the mouth of a small Bayou [Deer Island Pass] into which we steer North about fifty yards to the mouth of a large ditch into which we steer West by South about two hundred yards to the East end of the High Land of Deer Island. M^{r}. Hutton and myself Examined and Surveyed

> the Timber Soil and situation of this Island. we concluded there was on this little Island one hundred good Live Oak Trees . . . of the Second class from three to Six feet in Diameter with a considerable growth of young Live Oak with a variety of other Timber The Situation is beautifull ten feet high above the marsh nothing to obstruct the view but low marsh from the extensive Atchafalaya Bay and almost Boundless Gulph of Mexico The Soil a rich mixture of almost disolved Shells with rich black mould the Ear is here charmed with the united notes of the Mocking and Red Bird but sometimes disturbed with the dolefull Sound of the Owl which abounds here. the Eye is delighted with the Brilliant varieties of Blossoms produced from the different plumb Trees wild cherry and flowering Shrubs everywhere interspersed in the woods here. I am told that there is a great many Deer on this Island altho I saw none but from the prints of their feet in the marsh surrounding the high Land the[y] must be very numerous. This Island taken abstractively is certainly a delightfull spot —

On January 26, 1819, the Cathcart party entered Atchafalaya Bay and turned southeast into Fourleague Bay. There:

> At 1 PM we landed on a shelly point, . . . on the South side of the Peninsula, the West end of branch willow Island, bearing NW by W 1/2 W, 7 or 8 miles, & the NW point of marshy Island W by N, those are the outermost points, which form the channel between branch willow and Marshy Island, which is 2 or 3 miles wide . . . [Prichard et al. 1945:800-801].

Cathcart's usually excellent directions are somewhat confusing at this point, and it was not possible for Prichard et al. (1945:800, footnote 272) to accurately locate his "shelly point." From the general location, however, the editors guessed the location to be near the mouth of Blue Hammock Bayou (Prichard et al. 1945:800, footnote 278). With the more recent discovery of Landreth's journal, it is now possible to accurately locate "shelly point," although Landreth makes no mention of any shell on the "Peninsula." A map of the Atchafalaya and Fourleague bays provided by Landreth clearly shows that the peninsula in question is Halter's Island Point and that "branch willow Island" is most likely Halter's Island (Newton 1985:83). Today, there are no known sites located on Halter's Island Point, although a rather long stretch of wave-washed shell was identified on the point from aerial photographs by Kathleen Byrd, former Louisiana State Archeologist. This shell most likely represents the "shelly" point noted by Cathcart.

After leaving the peninsula, Cathcart's party continued eastward through Fourleague Bay. Eventually they entered Oyster Bayou, the channel connecting the bay with the Gulf of Mexico. There, Landreth reported:

> . . . thence South South West three quarters of a mile to the mouth of the Bayou or Pass at its entrance into the Gulph of Mexico a fine high shell bank on the left hand of the mouth of the Bayou at its entrance into the Gulph on the main here we stop and eat dinner and observe the Latitude which we found to be Lat.[d] 29° 8" North.—

> . . . here we had a fine meal of oysters the oysters are very fine and in great plenty . . . [Newton 1985:82].

Again, there are no known sites at this location, nor any shell identified on aerial photographs. Perhaps the shell bank was simply a large, natural oyster reef, but that seems unlikely as the expedition ate lunch at the locale and since it is noted as a "shell bank" on Landreth's map of the Fourleague Bay area (Newton 1985:83).

The last possible site described by Cathcart and Landreth before the survey party headed east is of some interest, since it represents another case where no known site is presently recorded at the location noted. Cathcart states:

> . . . at 4h.30' PM the middle entrance of Bayou de Large or Buffalo bore due North dist. 1 mile, having a clump of trees over it, at the distance of 4 or 5 miles; the banks high of Clam, & other shells, the marsh inside of them very low & infested with millions of Musquitos which are insufferable; There are 3 entrances to this Bayou which flow in different directions to their junction, where they make one stream & end in the marsh, this stream in its passage runs into a small lake, which is nothing more than a swell of the same Bayou– [Prichard et al. 1945:803].

Landreth records the following:

> . . . thence East one mile to the westernmost mouth of Bayou Bufelo which runs North East-

> erly from thence East two miles to a point called four mile point in six feet water from said four mile point north about two hundred yards to the middle mouth of Bayou Bufelo which also runs North Easterly and is much about the size of the of the westermost mouth about eighty yards wide. from this point back to the other point a considerable indenture in the shore. here on four mile point is a shell bank on which we pitch our Tents for the night a shell bank being the most comfortable Lodging we can find in this country. very cold this Evening for this climate at Sun Down the Mercury in the Thermometer down to Sixty degrees a very disagreeable air . . . [Newton 1985:85].

It is unlikely that Cathcart's "banks high of Clam and other shells" could refer to anything but a shell midden.

Cathcart and Landreth then proceeded east passing through Lake Pelto, north of the Isles Dernieres and Wine Island, and subsequently some 18 mi up Bayou Petite Caillou. When their pilot assured them that he had traversed all the bayous between Petite Caillou and LaFourche, including Grand Caillou and Terrebonne, and that the timber along them was identical to that seen along the coast, the surveyors turned around and returned to the Atchafalya (Prichard et al. 1945:806-807). One their way back they camped on the shell bank (i.e. midden) at the mouth of Oyster Bayou (described previously) where four men were harvesting oysters for the Attakaps (Newton 1985:95).

Following the Cathcart survey, a period of 23 years elapsed before any of the sites reported by Cathcart and Landreth were again noted. In 1842, J. J. Williams conducted a survey of potential military approaches to New Orleans for that area of Louisiana west of the Mississippi River. Williams' survey was but one of several surveys performed under the direction of Captain George W. Hughes of the U.S. Army's Corps of Topographical Engineers.

On the 27th of February, 1842, Williams passed the Point au Fer Lighthouse and entered Atchafalaya Bay from the Gulf (Williams 1842:46-48). Heading up the Atchafalaya River, the survey party came to Cathcart's "Shell Island." Williams (1842:48) noted:

> . . . came to anchor within the River at the upper end of Shelly Island, for which see map . . . .

Williams' map of Shell Island is reproduced here as Figure 3-1. The island is labeled "La Fitte Point," contains numerous live oaks, and at least two solid squares, probably representing buildings, are shown.

Leaving Shell Island, Williams continued up the Atchafalaya to the mouth of Bayou Teche. His map of this stretch of the river is highly detailed and critical to an understanding of the mounds on Berwick's Plantation. For that reason, a portion is reproduced here as Figure 3-2. At the plantation "4 Indian Mounds" are shown and oriented in the same square pattern as noted by Landreth. Four structures, one of which presumably is the Berwick main house, are illustrated just landward of the mounds. One of the mounds is shown directly on the bank, suggesting that it was being cut into by the Atchafalaya at that time. It is clear from this that the mounds, if they had survived, today would be located in downtown Berwick. They, therefore, are not the same as the mound recorded by Weinstein et al. (1978) on Fairview Plantation about 2.5 km further up the river. Nevertheless, it is apparent that the western bank of the Atchafalaya River (or Berwick Bay) was the locus of at least two mound sites and extensive shell middens.

Nine years after the Williams survey, a short note in *De Bow's Review* refers again to what are probably the Berwick Mounds:

> Some there are, who attribute the design of these mysterious hills to a security against the annual overflows of the Mississippi; but this is absurd. As on Burwick's Bay, for instance, where stands the most remarkable one in the state, it is pitched upon the highest land, which, even with the greatest overflow ever known, has never been covered with water [Pierce 1851:602].

The fact that Pierce notes only one mound suggests that the other three had been destroyed by 1851. Their demise probably resulted from the combined efforts of man and nature, as development around Berwick Plantation and erosion from the river took their toll.

In addition to the mound at Berwick, Pierce (1851:601-602) notes mounds in nearby Terrebonne Parish, including one rather impressive group on Bayou Black:

> In the Parish of Terrebonne there are at least fifteen or twenty of these mounds, situated on

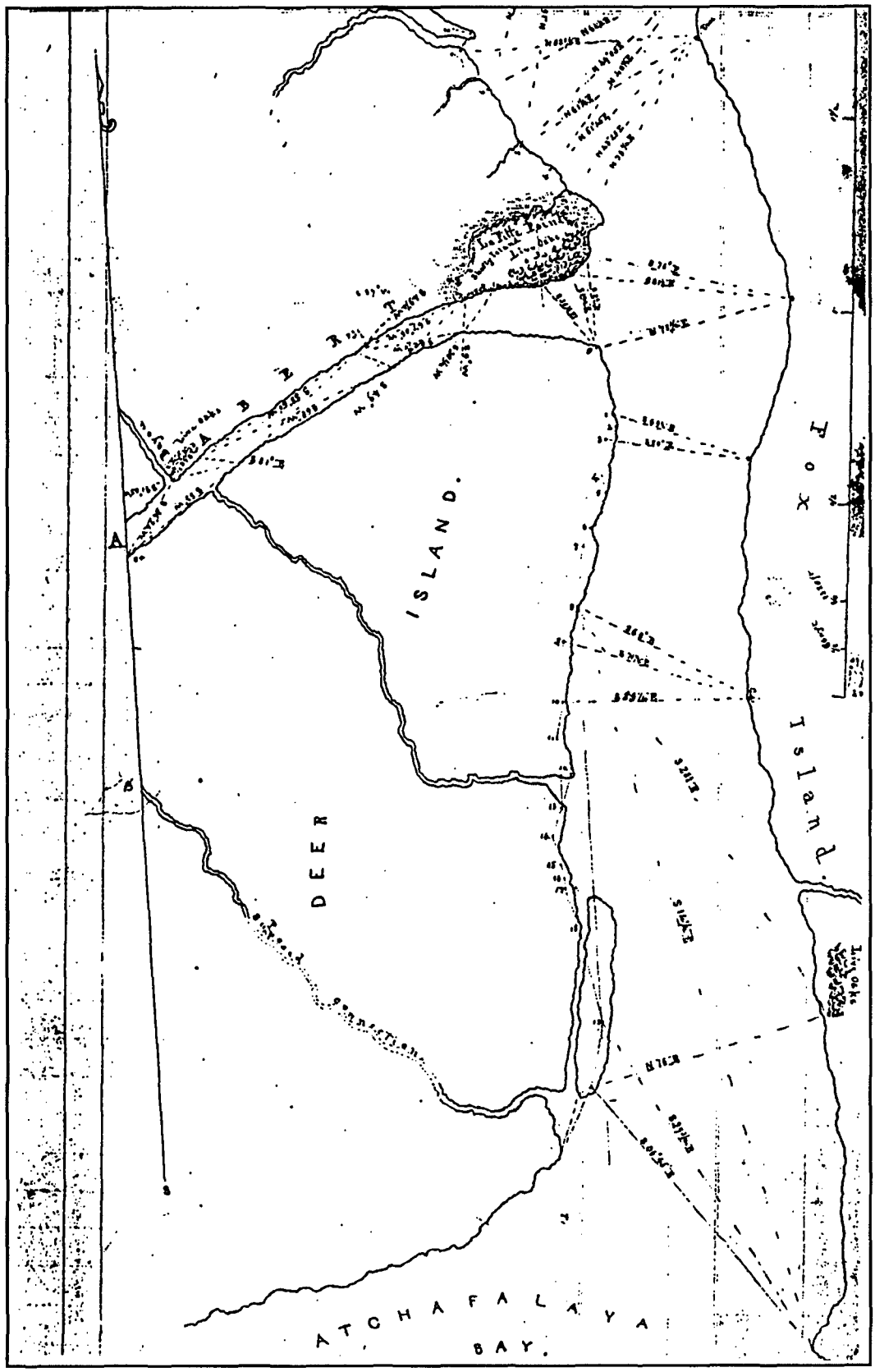


Figure 3-1. La Fitte Point at Shelly Island (Williams 1842:51.)

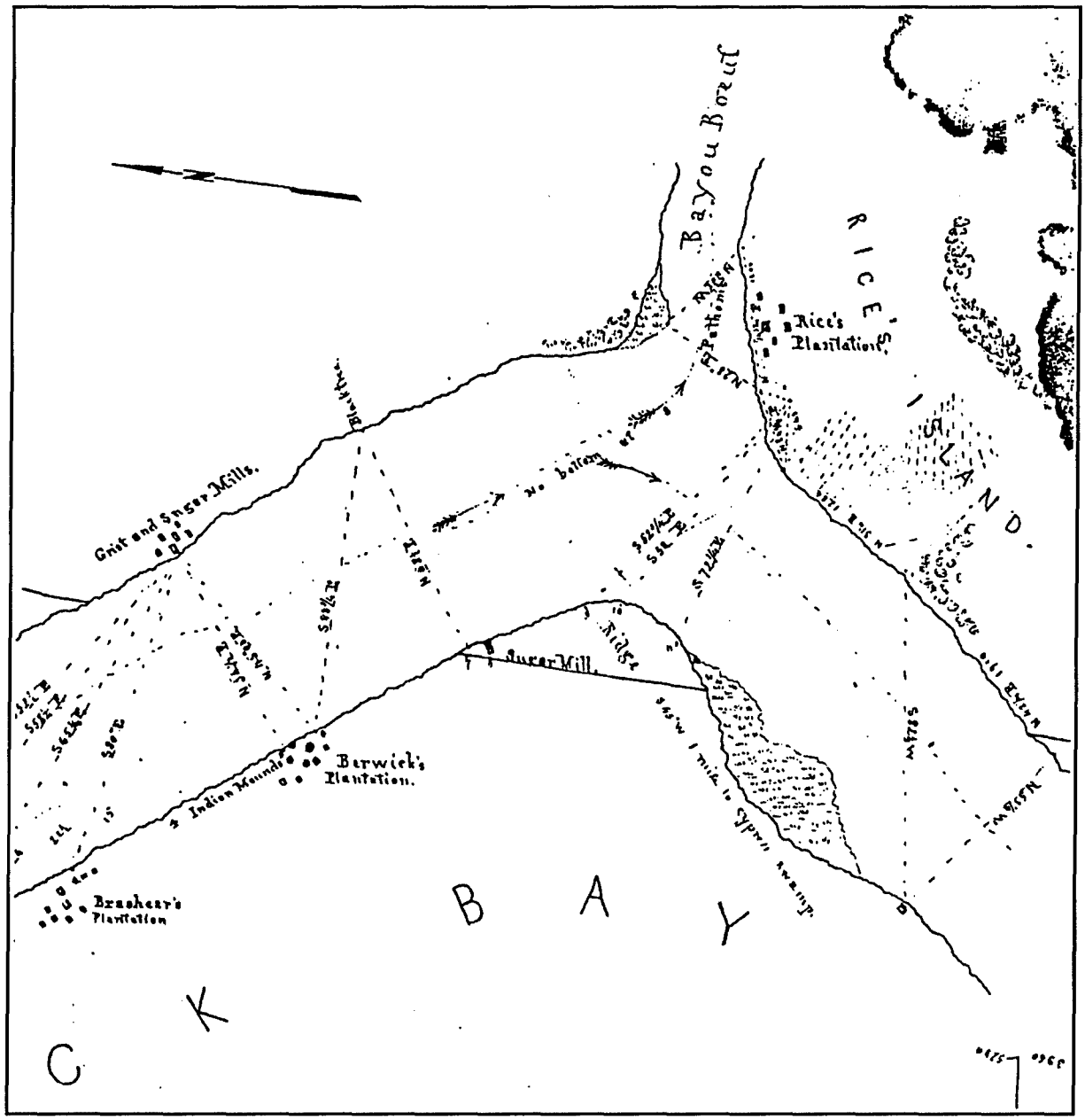


Figure 3-2. Southern end of Berwick Bay showing location of the Berwick Mounds (Williams 1842:56).

the Bayous Grand and Petit Caillous, Terrebonne, and the Black, of various sizes, and from appearances, of various dates. But the most remarkable of these is at Tigerville, about twenty-five miles from Houma, on the Bayou Black. From these mounds, which are undoubtedly the work of man, several skulls and bones of a human body have been picked, whence it is generally inferred, that they are or have been a repository of the dead, as were the celebrated pyramids of Egypt, and the mausoleums and temples of antiquity.

The site at Tigerville is known today as the Gibson Mounds (16TR5), and will be discussed further below.

The next reference to sites in the study area comes from a Confederate map of St. Mary Parish produced during the Civil War (Figure 3-3). Two Indian mound locations are shown along the west side of Berwick Bay. One mound was obviously the surviving member of the Berwick group. It is shown north of the railroad tracks crossing the area and described as hav-

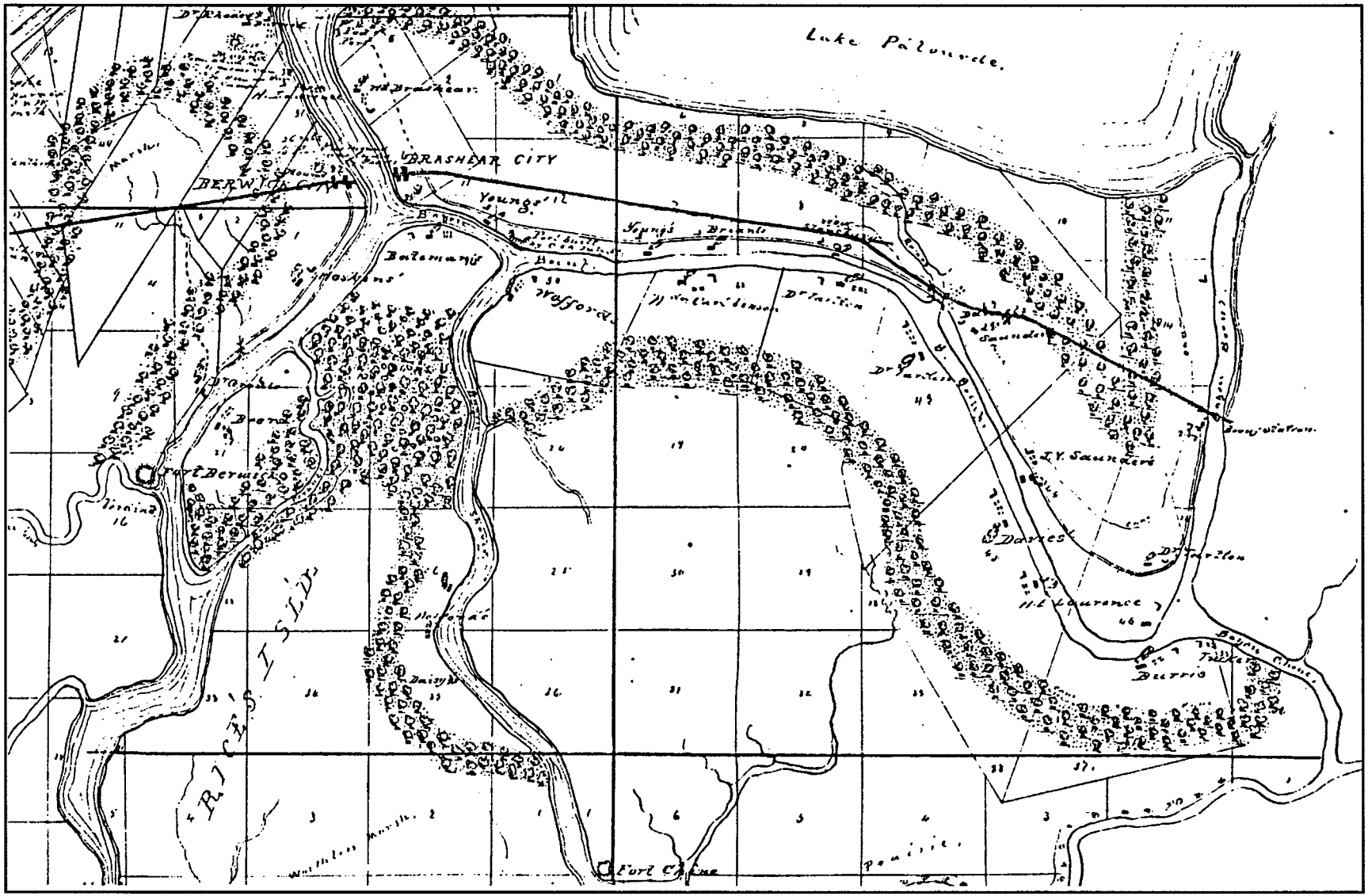


Figure 3-3. Portion of a Civil War-era map of St. Mary Parish, showing plantations, towns, fortifications, and Indian mounds (Confederate States of America 1864).

ing been leveled. The second mound is shown farther north in the present location of the Fairview Plantation Mound, already briefly discussed. Adjacent to this latter mound is the statement, "Mound from which the Yankees can be seen in their camp."

Further reference to the remaining mound at Berwick comes from J. W. Foster (1873) in his book *Pre-Historic Races of the United States of America.* Using notes supplied by Caleb Forshey (Neuman 1984:17-18), Foster notes that an extremely large mound once stood on the west side of Berwick Bay, was built of shells and loam, and stood some 20 ft high. Foster further related that this mound was destroyed by Union troops in 1863 because Confederate forces used it for cover from which to fire at Union ships (Foster 1873:159).

Twentieth Century

Following Foster's publication, a long hiatus occurred before any additional mention of sites in the region was provided. In 1926, Henry B. Collins of the U.S. National Museum spent almost three months examining sites across coastal Louisiana. A brief summary of his survey appeared the following year (Collins 1927). The section pertinent to the present study is presented below:

> From Pointe a la Hache, Mr. Collins proceeded to Houma, in Terrebonne Parish, and examined a number of mounds and shell middens. There he was fortunate in having the co-operation of Mr. Randolph A. Bazet, who is deeply interested in the local archeology and who was able to supply valuable information on many earth mounds and shell deposits of Terrebonne Parish. Such remains were found in unexpected numbers along the lakes and bayous, ranging from comparatively small accumulations of shells mixed with charcoal, potsherds, bones, and other refuse to huge deposits of the same material, or "islands" as they are locally called, sometimes a hundred yards or more wide, about 10 feet above the marsh level, and extending in some cases for a distance of almost a quarter of a mile. These Terrebonne Parish shell heaps, or kitchen middens, and the others throughout southern Louisiana, are composed almost entirely of the shells of a small brackish water clam, *Rangia cuneata*, which is very common in the bayous and lakes of the Gulf region. They represent merely the accumulated kitchen refuse of the Indians who once lived along these water ways. The clams were eaten, and the shells, along with other trash, were cast aside until in the course of time an extensive heap was formed.
>
> After devoting some 10 days to the mounds and shell heaps of Terrebonne Parish, investigation was made of those to the west and north at Gibson, Lake Palourde, Bayou l'Ours, Berwick, Charenton and Avery Island. Having examined and carried on minor excavations at these localities, Mr. Collins continued westward to Pecan Island in the southern part of Vermillion [*sic*] Parish where he remained for three weeks [Collins 1927:200-202].

Included in Collins' summary is an excellent photograph of the mound on Fairview Plantation. This photograph was reproduced by Weinstein et al. (1978:Fig. 55) in their discussion of that site. The photograph shows an almost conical-shaped structure topped by a burial vault of modern vintage. According to the present owner of Fairview Plantation, the mound reportedly was torn down in the early 1930s (Weinstein et al. 1978:161). The former mound location has been assigned site number 16SMY148, while a nearby shell midden, which undoubtedly was once part of the overall site, has been identified as 16SMY149 (Weinstein et al. 1978).

Following Collins' brief survey and discussion, approximately 30 years elapsed before any other work pertinent to the study area was published. Finally William G. McIntire (1958) conducted a landmark survey of Indian sites and their relation to changing courses of the Mississippi River and its distributaries. The 30-odd-year hiatus between Collins' survey and McIntire's study was unusual, for in the rest of Louisiana and the southeastern United States, archaeological research proceeded at an unprecedented pace. Primarily the result of Work Projects Administration (WPA) funding intended to put the unemployed to work during the 1930s and early 1940s, numerous sites were excavated and the results published. Through the extensive work of Ford (1935, 1936, 1951), Kniffen (1936, 1938), Ford and Willey (1940), Ford and Quimby (1945), Quimby (1951, 1957), Ford et al. (1955), and Ford and Webb (1956), archeological research had come of age in Louisiana.

These and other researchers were then able to establish a basic sequence of culture periods for the project region and denote the diagnostic artifacts used to identify them. Thus, by 1958 McIntire was able to classify his sites not only by type, such as shell

midden or earth mound, but by culture period(s) present. These data were then used to help reconstruct the paleogeography of the region. McIntire identified approximately 61 sites in the general study area. In addition, he (1958:Fig. 8) provided a cross section through the Gibson Mounds (16TR5), based on auger boring data, showing that the mounds had been built over a shell midden base. The shell midden was intermixed with Red River sediment, contained Marksville period ceramics, and led McIntire (1958:63-64) to suggest that the Boeuf course of the Red River was flowing down the old Teche-Mississippi channel during Marksville times.

Sites in the study area were not discussed again until Philip Phillips (1970) undertook his monumental synthesis of Lower Mississippi Valley archeology. Although concerned primarily with the lower Yazoo Basin in western Mississippi, Phillips devoted a significant portion of his study to the establishment of cultural phases for the Lower Valley. This followed the ideas earlier proffered by he and Gordon Willey (Phillips and Willey 1953; Willey and Phillips 1958).

Based primarily upon sherd counts provided by McIntire, Phillips was able to tentatively assign sites in the study area to the various phases he recognized. Thus, sites of the Marksville, Baytown (McIntire's Troyville), Coles Creek, and Mississippi (McIntire's Plaquemine) periods are discussed and illustrated (Phillips 1970:899-900, 911-912, 920-922, 949-951, Figs. 444, 445, 446, 447). One site of particular importance was Mandalay Plantation (16TR1) which Phillips (1970:899) set up as the type site of the Mandalay phase of the Marksville period.

General culture history research in the region was superceded by "contract archeology" or "cultural resources management" after about 1970. Probably most pertinent to the current project is Robert Neuman's (1974) shoreline survey of the Houma Navigation Canal and Bayous La Carpe, Terrebonne, Petit Caillou, and Grand Caillou. He noted sites 16TR6 and 16TR37 along Bayou Grand Caillou, and 16TR86 on Bayou Terrebonne. The year before, Neuman (1973) had conducted another survey of Bayou Lafourche and the Lafourche-Jump Waterway during which he noted site 16LF31. He reiterated the results of these two surveys in *An Archaeological Assessment of Coastal Louisiana* published in 1977.

The 1975 survey by CEI (Gagliano et al. 1975) of the GIWW was the first large-scale, intensive survey to cross the present study area since McIntire's research in the 1950s. Although actual survey coverage was limited to the banks of the waterway, sites within one mile of the GIWW were also reviewed. Perhaps the most useful contribution of the study was the presentation of a revised sequence of delta lobe formation and associated archeological sites (Gagliano et al. 1975:46-57). However, most researchers in the area no longer employ this sequence (Saucier 1981; Smith et al. 1986; Weinstein and Gagliano 1985).

Also in 1975, Gulf South Research Institute conducted a pipeline survey through parts of Terrebonne, Lafourche, Jefferson, and Plaquemine parishes. The four sites found in Terrebonne Parish were a multi-mound site (16TR32) near Pointe au Chien, and three sites (16TR215, 16TR193, and 16TR194) with both historic and aboriginal components. All three of the latter produced only grog-tempered pottery and were deemed ineligible for the NRHP. Two years later, in 1977, the southern (i.e. underwater) portion of the project area was included in a broad discussion of the prehistoric and archaeological potentials of the Gulf of Mexico by Coastal Environments, Inc. (1977), but no specific information on the project area is given.

In 1978, three highly important reports, based on federally mandated surveys, were published (Altschul 1978; Gibson 1978b; Weinstein et al. 1978). All three resulted in the first site testing by professional archaeologists conducted in the region. The first survey (Weinstein et al. 1978) consisted of an intensive terrestrial survey of the proposed relocation route of U.S. 90 and an inspection of sites within approximately 1.5 km of the route (Weinstein et al. 1978:1). Of the 30 sites recorded, two—Thibodaux (16AS35) and Bayou Ramos I (16SMY133)—were tested to determine National Register significance. In addition, the Gibson Mounds site (16TR5) was examined superficially after it was discovered that one of the three mounds had been cut in half to make room for a proposed mobile home park. The survey crew was allowed to clear and record a profile of the remaining mound remnant and collect surface artifacts from the site.

At all three sites either *Rangia* shells or charcoal samples were collected, and subsequently radiocarbon dates obtained. These became the first absolute dates obtained from any site in the Morgan City-Terrebonne marsh region. Radiocarbon dates and ceramic analysis from the Bayou Ramos I

site prompted the authors to subdivide the Bayou Cutler phase of the Coles Creek period, retaining the term Bayou Cutler for the early half of the period and establishing Bayou Ramos for the latter half. Another regional first was Weinstein et al.'s (1978) recordation of historic-period sites—certainly some of the first documented in Louisiana's coastal zone.

Jon Gibson at the University of Southwestern Louisiana published the second of the 1978 studies. The survey area included proposed channel enlargement sections along bayous Chene, Black, Boeuf, and the Avoca Island Cutoff. Forty-three sites were either discovered or revisited. Testing at Oak Chenier (16SMY49) uncovered a human burial at a depth of between about 70 and 95 cmbs (Gibson 1978b:129-130). Eight other sites (16TR104, 16TR105, 16TR109, 16TR110, 16SMY49, 16SMY62, and 16SMY63) were subjected to coring to determine their environments of deposition. Unfortunately, core locations were not provided, and no radiocarbon dates obtained. Gibson's study was, nevertheless, the first in the area to provide detailed zooarcheological analyses of certain sites (Byrd 1978), statistical analysis of the relative locations of sites (Gibson and Gramling 1978), and a model of lower Atchafalaya Basin subsistence strategies (Gibson et al. 1978).

Altschul produced the third report of 1978 for New World Research, Inc. Some 33 previously known sites within proposed sewerage line routes across much of Terrebonne and Lafourche parishes were investigated, several located on Bayou du Large. A total of 14 1-by-1-m test units were dug at nine sites, but no radiocarbon dates were obtained. Sites were seriated apparently using Plaquemine ceramics from all contexts (test units, shovel tests, surface collections), thus preventing the identification of individual components within the Plaquemine culture. Altschul's (1978:186-189) conclusion that the Terrebonne marsh area was inhabited by two chronologically separate cultures during Plaquemine times, with the earlier group conducting seasonal exploitation of the region through the use of a modified form of the seasonal round and the later living in permanent villages or dispersed homesteads, is therefore highly questionable. Yet his proposed settlement model has supplied valuable site-specific data of use in future investigations.

Also in 1978, Robert Neitzel examined a proposed pipeline canal route near Montegut, but no cultural resources were located. A remote-sensing survey was also conducted that year to the east of East Timbalier Island to evaluate cultural resources for an offshore oil port marine facility (Gagliano et. al. 1978). None of the recorded magnetic anomalies were considered historically significant due to the fact that the "seafloor in the survey area is crisscrossed by pipelines and littered with debris related to the offshore mineral extraction industry" (Gagliano et al. 1978).

The next major report to consider sites in the study area was Gibson's (1979) review of previous research throughout the entire Atchafalaya Basin and surrounding regions. Particularly relevant to the present study is his (1979:110-115) summary of the work conducted at Thibodaux (16AS35), Bayou Ramos I (16SMY133), Gibson Mounds (16TR5), and Oak Chenier (16SMY49). Also conducted in the late 1970s were Philip Rivet's surveys of the proposed bridge replacements for the LA 55 bridge over Humble Canal (Terrebonne Parish) and nine bridges on LA 20 between Schriever and Gibson (Rivet 1977, 1979). Three known sites (16TR5, 16TR99, and 16TR100) within or adjacent to the project area were reviewed in the latter survey. Spoil at the bridge sites from DOTD dredging (already in progress) revealed only "modern cultural debris," thus impact to cultural resources was determined to be negative. The LA 55 bridge project failed to located any cultural resources. Three years later in 1982 Gibson returned to the Atchafalaya to survey selected portions of the levees ringing the basin. Those sites located in potential impact areas were tested. None of these sites, however, lie in the present project area.

In 1983, two cultural resources surveys (Castille 1983; Castille and Holmes 1983) were undertaken in the city of Houma to assess historic sites and standing structures along Bayou Terrebonne for a proposed bridge corridor. These studies identified 283 historic structures, several dating to the middle and late 19th century. Many of the structures are associated with the oyster and shrimp canning/packing industry of Houma. Many structures were located along Bayou Terrebonne on East Main Street and East Park Avenue, an area of much watercraft activity in the late nineteenth century and early twentieth centuries.

Another bankline survey particularly pertinent to the project area was preformed by R.A. Flayherty and J.W. Muller for the U.S. Army Corps of Engineers (COE), New Orleans District, in 1983. Bayou Grand Caillou between Bayou Provost and the Houma Navigation Canal were examined. Previously re-

corded sites 16TR6 and 16TR37 were visited while one new shell midden site on Bayou Grand Caillou (16TR151) and 69 derelict vessels were newly recorded. 16TR151 was thought to be Plaquemine or Mississippian in date. A magnetometer was used in this survey, but no significant anomalies were recorded. Flayharty and Muller noted that local informants knew of submerged watercraft; and that the negative remote sensing results were probably due to the fact that most, if not all of these craft, were of mostly wooden construction.

In 1984, Floyd and Stuckey reported on a remote-sensing survey conducted to determine the location of seafloor or subbottom hazards to construction of a 10-inch pipeline for Texas Gas Transmission Corporation. The instruments used in this survey were a magnetometer, side-scan sonar and a subbottom profiler. The pipeline route was in Blocks 2 and 9, south of Isles Dernieries and west of Cat Island Pass. Eleven magnetic anomalies were located; but all ranged from 15 to 24 gammas with very brief signature widths, suggested the anomalies "represented debris discarded during prior construction activities in this rather congested production field" (Floyd and Stuckey 1984). Also in 1984, William McIntire and Robert Baumann examined a proposed weir site near Marmande Ridge and Minors Canal. They located 16TR69, a rangia shell midden partially destroyed by the digging of Minors Canal. Test excavations showed that possible intact deposits remained at the site but would probably be eroded away within a few years due to boat traffic and use of the site as a fishing camp. Weir construction was, therefore, allowed to proceed.

William Haag's (1985) subsequent survey of three proposed forced drainage areas in Terrebonne Parish (lower Montegut, Pointe au Chien, and Isle de St. Jean Charles) encountered no cultural resources. The following year R. Christopher Goodwin & Associated, Inc., examined the route of the proposed Larose and Golden Meadow Hurricane Protection Levee. While no new sites were identified, a previously recorded site (16LF99) outside the right-of-way was tested to determine its size and cultural affiliation (Poplin et. al. 1986). Likewise the pipeline survey Weinstein (1985b) conducted for the Texas Gas Transmission Company in Terrebonne Parish located no cultural resources. Yet an unrecorded mound group (16TR189) was noted on Bayou Sale, 2.4 km north of the pipeline route. McIntire and Baumann (1985) likewise found no new sites during their survey of a proposed water control structure near Lake Carrion Crow, but did conduct test excavations at known shell midden site 16TR66. This site was in excellent condition and thus eligible for the NRHP. Fortunately, 16TR66 lay 205 m outside the project area and would not be impacted.

A survey of the Morgan City hurricane protection project (Goodwin et al. 1985a) provides a detailed review of the history of the Morgan City area, but is of particular importance for the data obtained from a testing program at the Goat Island site (16SMY1). Although little artifactual data were collected, three radiocarbon dates clustering around A.D. 1100 were obtained on *Rangia* shells and charcoal from two of the units (Goodwin et al. 1985a:Table 8). Using these dates, plus previous ceramic counts provided by Weinstein et al. (1978), the authors review the chronology of Coles Creek period components in the region. They argue that the Goat Island and Bayou Ramos I (16SMY133) sites are contemporary (Goodwin et al. 1985a:110), although it is also possible that more than one component exists at Goat Island. The few diagnostic sherds noted by Weinstein et al. (1978) could relate to either the Bayou Cutler or Bayou Ramos phase, while the dates obtained by Goodwin et al. (1985a) could suggest another component either of, or related to, the transitional Coles Creek/Plaquemine culture St. Gabriel phase (Brown 1985b; Weinstein 1987b).

Weinstein (1987a) conducted a survey along Bayou Mauvais Bois in the Terrebonne Parish marshes west of the project area. This study involved investigations along two proposed pipelines and examined several prehistoric shell middens (16TR190-16TR192). All three sites were avoided during pipeline construction. William McIntire and Robert Baumann conducted three small surveys that same year, one for a proposed sewerage line and facilities south of Houma (1987a), another for a levee and flood gate near Chauvin (1987b), and a third for a levee and pump station on Bayou Grand Caillou near Dulac (1987c). Portions of Bayou Little Coteau, Ashland Canal, St. Louis Canal, and Bayou Petit Caillou were examined during the first survey, but no new or previously recorded sites could be located. No cultural resources were noted in the project area on the second survey, but nearby sites 16TR10 and 16TR86 were determined to be one in the same site. Likewise, the third survey produced no findings, although nearby known site 16TR6 was discussed.

In 1989 Heartfield, Price, and Green, Inc., conducted a survey for Tenneco Gas of a proposed pipe-

line beginning near the juncture of Bush Canal and Bayou Terrebonne and extending east across 1.6 mi of freshwater marsh. While no new sites were located, 16TR10/86 was reexamined and the site limits refined. Also, in that year Pearson et al. (1989) produced a general study of the history of waterborne commerce and shipwreck potentials within the New Orleans District. Although the project area was not considered specifically and the navigation history of the immediate area only minimally discussed, this study did note the existence of several reported historic shipwrecks in the general vicinity of Cat Island Pass. Thomas Birchett and Charles Pearson (1998) conducted a remote sensing survey of the Cat Island Pass Channel portion of the Houma Navigation Canal in 1987. Four anomalies with characteristics similar to known shipwrecks were identified, but diving confirmed that none represented significant cultural resources.

Coastal Environments, Inc., conducted a large-scale investigation of the Terrebonne marsh as part of a New Orleans District COE effort to better protect Morgan City from floodwaters (Weinstein and Kelley 1992). Thirty-four new sites were located, 36 known sites revisited, and the collections from another 21 known sites reviewed. One thrust of this study was the documentation of changes in the deltaic environment and human settlement patterns through time. Site densities were also examined, and the future condition of the cultural resource base in the area predicted based on models of habitat change.

Rebecca Saunders of the Museum of Natural Science at Louisiana State University tested 16TR22 near the intersection of Mound Bayou and Bayou Grand Caillou in 1994. Her aims were to determine the site's National Register status and to look for complicated stamped, shell-tempered ceramics similar to those found in Florida. Two of the three possible mounds at the site reported by McIntire in 1951 had apparently eroded away by this time, but test units were placed in the surviving mound. Radiocarbon dating confirmed a Coles Creek component at this site, in addition to Mississippi Period and historic components.

Late in 1995, the New Orleans District COE instructed R. Christopher Goodwin & Associates, Inc., to conduct additional investigations on eight of 37 derelict watercraft previously identified on Bayou du Large in 1992 (Stout 1992). That study had examined Bayou du Large from the Falgout Canal to Grand Pass. All eight vessels were reportedly too badly deteriorated or inaccessible below the waterline by 1995, so six others were examined instead (Robinson and Seidel 1995). This study involved photography, measured drawings, historical research and oral interviews.

The following year in 1996, R. Christopher Goodwin & Associates, Inc., surveyed the route of a proposed gas transmission line from the Gulf of Mexico to Lafourche Parish (Miller et al. 1996). Two new sites (16LF65 and 16LF66) with Plaquemine and nineteenth-to-twentieth-century components were discovered. The former was recommended for additional testing, while the latter was declared eligible for the National Register of Historic Places (NRHP) and mitigation recommended. A year later this same company examined two proposed dredge disposal areas on Bayou du Large in Terrebonne Parish (Walter et al. 1998). No archaeological sites were encountered, but six standing structures were documented and declared ineligible for the NRHP. Also in 1997, R. Christopher Goodwin & Associates, Inc., surveyed a pipeline corridor in Lafourche Parish near Larose (Williams et al. 1998). Three standing structures were recorded but deemed ineligible for the NRHP. This company also conducted data-recovery excavations for the same pipeline company in 1997 at 16LF66 located at the confluence of bayous Blue and Manuel. Midden deposits and numerous subsurface features were identified during the excavation of this Plaquemine site, as well as 37 human burials (Miller et al. 2000).

Two mitigation reports on historic sites in Terrebonne Parish appeared in print in 1998 and 1999, both produced by CEI. The earlier volume describes field investigations conducted at the Donner Sawmill Residential Area (16TR116), near the present-day town of Donner, in 1989 (Hahn and Schwab 1998), and builds on previous work at the site by Castille et al. (1979) and Castille and Pearson (1980). Donner was a company town occupied from about 1900 to 1938 before being reclaimed by the swamp. The second report explains similar excavations conducted in 1982 at the Goodland Cypress Sawmill Company site (16TR114) in Chacahoula (Whelan and Pearson 1999). Artifact assemblages from the homes of sawmill administrators, white laborers of Cajun descent, and black sawmill workers were compared in an attempt to determine if race, culture, and economic status were reflected in their material culture.

The last studies conducted in the project region to date, and two of the most pertinent are those by R. Christopher Goodwin & Associates, Inc., for the Morganza to the Gulf Feasibility Study (Brown et al. 1997, 2000). The earlier report is a "Literature Search and Records Review" type study, the main aim of which was to create a predictive model for site locations in a delta setting. The latter report details a sample survey conducted to test the predictive model, which states that sites will be found on natural levees. Results verified the model, while six new sites and two new standing structures were discovered. Five known sites and three previously recorded standing structures were also revisited. Three sites (16TR19, 16TR33, and 16TR304) and two standing structures (55-1013 and 55-1113) were recommended as eligible for the NRHP. The Louisiana Divisions of Archaeology and Historic Preservation disagreed with three of these recommendations and have determined site 16TR304 and structures 55-1013 and 55-1113 as not significant.

CHAPTER 4

ABORIGINAL CULTURAL CHRONOLOGY

This section will provide data on the postulated cultural chronology of the central Louisiana coast, particularly the lower Atchafalaya Basin and adjacent marshes in the prehistoric and contact periods. As much of this information has been presented previously (Brown et al. 1997, 2000; Gibson 1978b, 1979; Goodwin et al. 1985a; Neuman 1977, 1984; Weinstein 1994; Weinstein et al. 1978; Weinstein and Kelley 1992), only a brief synopsis is provided.

Prehistoric Period

Figure 4-1 provides the latest chronological framework of the prehistory of the Louisiana coastal zone, based on Weinstein (1985a). Since the earliest intact and accessible landforms within the study area are related to the Teche-Mississippi course and its distributaries (ca. 3800 to 1900 B.C.), the following discussion will begin with the earliest culture period that was in existence during that time: the Middle Archaic. Although earlier Paleo-Indian and Early Archaic components are known from the coastal zone (see, for instance, Coastal Environments, Inc. 1977; Gagliano 1967, 1970; Weinstein et al. 1979b), these generally occur in areas where relict Pleistocene-age, Prairie Terrace features are being exposed by shoreline transgression or on uplifted saltdome islands. Such features are deeply buried within the present study area and would not be encountered in anything but relatively deep borings.

The previous Paleo-Indian and Early Archaic populations are believed to have been arranged around a band-level society which practiced hunting and gathering of wild foodstuffs, probably organized around a seasonal round in which specific periods of the year were devoted to the collection of a particular resource. The Paleo-Indians were supposedly adapted to terminal Pleistocene or early Holocene environments, while Early Archaic peoples were adapted to an expanding boreal forest environment (Weinstein and Kelley 1984:32-34). Lithic tools, principally in the form of distinctive projectile point types, are almost the only means archeologists have for identifying remains of these earlier periods.

Middle Archaic Period, 5000-3000 B.C.

The Middle Archaic period is characterized by widespread regional differentiation of cultures, and a number of developments in ground stone technology. The latter includes grooved axes, atlatl weights and pendants, as well as more extensive use of grinding stones, which first appeared in the previous period. This period also roughly corresponds with the Hypsithermal Interval, which brought increased warmth and aridity to areas bordering the Great Plains (Wood and McMillan 1976). The impact of this climatic shift on other portions of the Southeast is not well known at present. It may be that the intensive shellfish collecting evidenced at some riverine sites

STAGE	PERIOD	CULTURE	TIME INTERVAL	PHASES		
				EASTERN AREA	CENTRAL AREA	WESTERN AREA
FORMATIVE	HISTORIC	VARIOUS CULTURES	A.D. 1800	←	VARIOUS TRIBES	→ LITTLE PECAN
	MISSISSIPPI	MISSISSIPPIAN / PLAQUEMINE	A.D. 1700	DELTA NATCHEZAN / MEDORA / BARATARIA (BAYOU PETRE)	PETITE ANSE / BURK HILL	BAYOU CHENE
			A.D. 1600			
			A.D. 1500			
			A.D. 1200			
	COLES CREEK	TRANSITIONAL COLES CREEK	A.D. 1000	ST. GABRIEL	THREE BAYOU	HOLLY BEACH
		COLES CREEK	A.D. 900	BAYOU RAMOS	MORGAN	JEFF DAVIS
			A.D. 850	BAYOU CUTLER	WHITE LAKE	WELSH
	BAYTOWN	TROYVILLE-LIKE	A.D. 700	WHITEHALL	?	ROANOKE
	MARKSVILLE	MARKSVILLE	A.D. 400	GUNBOAT LANDING / MAGNOLIA & MANDALAY	VEAZEY	LAKE ARTHUR
			A.D. 200	SMITHFIELD / LABRANCHE	JEFFERSON ISLAND	LACASSINE
	TCHULA	TCHEFUNCTE	A.D. 1	BEAU MIRE / PONTCHARTRAIN	LAFAYETTE	GRAND LAKE
			250 B.C.			
ARCHAIC	POVERTY POINT	POVERTY POINT	500 B.C.	GARCIA / BAYOU JASMINE	BEAU RIVAGE / RABBIT ISLAND	?
			1000 B.C.			
	LATE ARCHAIC	ARCHAIC	1500 B.C.	PEARL RIVER	COPELL	BAYOU BLUE
	MIDDLE ARCHAIC		3000 B.C.	MONTE SANO / AMITE RIVER	BANANA BAYOU	?
	EARLY ARCHAIC		5000 B.C.	ST. HELENA	?	?
LITHIC	LATE PALEO	PALEO-INDIAN	6000 B.C.	JONES CREEK	VATICAN	STROHE
	EARLY PALEO		8000 B.C.	?	AVERY ISLAND	?
	PRE-PROJECTILE POINT	?	10,000 B.C.	?	?	?
			?			

Figure 4-1. Cultural chronology of south Louisiana (Weinstein 1985a).

of this period represents a response to this change (Lewis and Lewis 1961:20). Stoltman (1978:714-715) has also suggested that plant collecting increased in importance during this time.

During this period sedentism and more complex social organization are reflected in increased site size, midden development, the use of storage pits, utilization of local raw materials, and an increase in the number of burials (Jeter et al. 1989:86; Weinstein and Rivet 1978). Additionally, evidence of Middle Archaic mound building has been found in South Louisiana (Gibson and Shenkel 1989; Homberg 1992; Manuel 1979, 1981; Neuman 1992; Russo 1994: Table 1; Saunders 1994).

In coastal Louisiana, very little evidence of the Middle Archaic period has been recognized. What there is comes generally from the Florida Parishes north of Lake Pontchartrain and in the Prairie Terrace region of southwestern Louisiana. Three regional phases have been identified, Monte Sano, Amite River, and Banana Bayou, but all are somewhat removed from the area under consideration. Perhaps components of the Banana Bayou phase, named for a small conical mound (16IB24) situated on the flanks of Avery Island that produced material and radiocarbon dates suggestive of a transitional Middle to Late Archaic age (Gagliano 1967; Brown and Lambert-Brown 1978), will eventually be found in the area. Artifacts recovered from the primary mound at Banana Bayou included Williams and Pontchartrain points, crude bifaces, lithic debitage, and a relatively large percentage of amorphous baked clay objects (Brown and Lambert-Brown 1978:Table 5).

Closer to the study area, and of immediate importance to the Teche-Mississippi course, is the location of site 16IB101 on the edge of the Prairie Terrace overlooking the Teche channel just south of New Iberia. This site reportedly has a Middle Archaic component (Coastal Environments, Inc. 1977:3:Pls. 4-5) and may represent an elevated habitation locale associated with the active Teche-Mississippi.

Late Archaic Period, 3000-1500 B.C.

Research elsewhere in eastern North America suggests that the Late Archaic period was a time of marked population increases and the beginning of extensive trade networks. The evidence for the former is seen in the appearance of large habitation sites such as Indian Knoll, Kentucky (Webb 1946), while the latter is reflected in the exotic raw materials that occur at some sites. Cultivation involving several native seed plants, including sumpweed, chenopod, and sunflower, as well as squash, which is now thought to have been independently domesticated in eastern North America, also began during this period (Smith 1989).

Mound building continued into the Late Archaic in the Southeast. Recent excavations and a reevaluation of past investigations now suggest that the building of conical mounds was an inherent part of Archaic period culture in the southeastern U.S. (Piatek 1994; Saunders 1994; Saunders et al. 1994). At least 11 mound sites in Louisiana and Florida have been securely radiocarbon dated to the Archaic period (Russo 1994:Table 1). Mound building, and initial plant cultivation, appears to reflect an increase in social and cultural complexity through the Late Archaic period.

In coastal Louisiana, three geographically separated phases have been identified, but only the Pearl River phase, based on material from the Cedarland site (22HA506) in Hancock County, Mississippi (Gagliano and Webb 1970), is relatively well known. The Copell Phase is based on excavations into an apparent preceramic cemetery on Pecan Island (Collins 1941), while the Bayou Blue Phase is named after a site (16AL1) in Allen Parish (Coastal Environments, Inc. 1977; Gagliano et al. 1982; Weinstein et al. 1977, 1979b). Typical diagnostic artifacts include Evans, Ensor, Gary, Maçon, Palmillas, and Pontchartrain point types (Gagliano and Webb 1970; Gibson 1976), along with ground- stone implements such as winged atlatl weights, and tubular pipes (Gagliano and Webb 1970:Table 3).

Gibson (1976) has noted several apparent Late Archaic assemblages from the Prairie Terrace surface around Lafayette, while Weinstein et al. (1979b) record similar sites near Opelousas. Of particular importance to the present study are several Late Archaic sites that apparently are directly associated with Teche-Mississippi natural levees (Gagliano et al. 1978). These are sites 16SL16 and 16SL19, reported by Neuman and Servello (1976:24) in the Holocene floodplain east of Opelousas. Their presence is almost certainly related to the Teche channel after the Mississippi had abandoned the course. The fact that such sites exist on the Teche-Mississippi natural levees to the north of the study area implies that similar sites could occur in the Terrebonne marsh region.

Poverty Point Period, 1500-500 B.C.

In much of eastern North America this time interval witnessed a transition from Archaic hunting and gathering cultures to Woodland cultures characterized by food production, pottery manufacture, and mound building (Stoltman 1978:715-717). Current interpretations suggest that these three features have different and possibly unrelated origins. As noted above, tropical domesticates had reached the East prior to 2000 B.C., and there is good evidence of cultivation of native seed plants in the Kentucky and Ohio area by 1000 B.C. (Struever and Vickery 1973). Ceramics probably appeared somewhat earlier than this in the third millennium B.C. along the Atlantic Coast (Stoltman 1978:715), and mound building may have developed independently in several areas by 1000 B.C.

In the Lower Mississippi Valley, this transition is marked by the development of the distinctive Poverty Point culture. Among the material characteristics of this culture are baked clay balls or Poverty Point objects, microlith and lapidary industries, and earthworks (Webb 1977). Pottery is not abundant, but fiber-tempered and sand-tempered wares have been found at several sites. Subsistence data are, in general, few, but they suggest a continuation of an Archaic pattern of intensive collecting of wild plants and animals. However, there is mounting evidence for the cultivation of a tropical domesticate, squash, at Poverty Point sites (Ford 1974; Jackson 1986; Shea 1978).

As with the previous culture periods, several Poverty Point period phases have been established for south Louisiana, but their recognized ranges are either too far east or west to include the present study area. Nevertheless, Poverty Point components have been recognized at a number of sites relatively near the study area, and it is likely that ties to either the Rabbit Island (Phillips 1970:875) or Beau Rivage (Gibson 1974a, 1974b, 1976) phases will be found. In fact, the Rabbit Island site itself (16SMY8) is located only about 30 km west of the mouth of the Atchafalaya River, at the distal end of the Bayou Sale distributary—a channel emanating from either the Maringouin- or Teche-Mississippi course (Smith et al. 1986:Pl. 38; Weinstein and Gagliano 1985:123). Other sites with Poverty Point components include Cargill Canal (16SMY102) located at the edge of the Belle Isle saltdome (Brown et al. 1979:36-40; Weinstein 1984:11-13; Veatch 1899:299), and site 16SMY32 (Coastal Environments, Inc. 1977:3:Pls. 4-5), a locale possibly associated with a Teche-Mississippi distributary (Smith et al. 1986:Pl. 39). Two Late Poverty Point sites located in the marshes of Terrebonne Parish by Weinstein and Kelly (1992) are 16TR211 and 16TR212. The former, a shell midden, and the latter, an earth midden, both produced Poverty Point objects. Their presence indicates that the abandoned channel along which the sites occur (Turtle Bayou) is a Teche-age channel.

Tchula Period, 500 B.C.-A.D. 1

This period in the Lower Mississippi Valley is characterized by the integration of food production, pottery manufacture, and mound building into a single cultural system. In the southern portion of the valley these developments take place in an archeological culture called Tchefuncte. Originally defined in southern Louisiana (Ford and Quimby 1945), Tchefuncte culture is now recognized to extend as far north as the vicinity of Clarksdale, Mississippi, and as far west as northeast Texas. The diagnostic artifacts of this and most of the succeeding prehistoric cultures of the Lower Mississippi Valley are distinctive ceramics. Tchefuncte pottery is characterized by a laminated paste that appears to lack tempering. Replication studies suggest that the laminated texture is simply the result of minimal preparation of the raw material (Gertjejansen 1982; Gertjejansen and Shenkel 1983), an expected feature of an incipient ceramic technology. Other diagnostic attributes of Tchefuncte ceramics include the use of podal supports and decorative techniques such as jab-and-drag incising.

The evidence for food production in Tchefuncte culture presently comes from one site, Morton Shell Mound (16IB3), where remains of two tropical cultigens–squash and bottle gourd, and one possible native cultigen, knotweed–were recovered (Byrd and Neuman 1978:11-13). Given the limited nature of these findings, the importance of cultivation in relation to the remainder of the subsistence base is still uncertain. Mound construction, now well documented for the preceding Late Archaic and Poverty Point periods, is surprisingly not clearly associated with Tchefuncte culture. Alan Toth (1988:27-28) has recently reviewed the evidence for Tchefuncte burial mounds and suggested that they are the result of diffusion of certain aspects of Marksville burial practices among a few late Tchefuncte groups. Further research is required to verify this hypothesis.

Again, no specific phase of Tchefuncte culture has been defined for the present study area, and, in

fact, no Tchefuncte sites were known from it prior to Weinstein and Kelley's 1992 Terrebonne Marsh study. Tchula components, most of them late, were identified at 16AS16, a single mound site; 16AS36, a possible mound site; the shell midden sites 16TR28, 16TR31, and16TR60; and the two Poverty Point sites mentioned above, 16TR211 and 16TR212. Given the proximity of the Lafayette phase and its association with the natural levees of the Teche-Mississippi meander belt (Gagliano 1967; Phillips 1970; Gibson 1974b, 1976; Weinstein 1986), it is highly likely that additional components of this phase are present. The fact that Tchefuncte sites of the Lafayette phase or a similar entity occur within the study area is particularly interesting since the Lafayette phase is the one relatively reliable case where conical burial mounds have been associated with the Tchefuncte culture (Gibson 1974b; Weinstein 1986). Gibson (1974a:85) suggests that the mounds served as communal burial locales for a dispersed population residing at small, seasonal base camps or semi-permanent villages.

Marksville Period, A.D. 1-400

In many parts of eastern North America this period is marked by evidence of extensive interregional contact through a phenomenon labeled the Hopewell Interaction Sphere (Caldwell and Hall 1964). The focal points of this interaction sphere were societies in the Ohio and Illinois River valleys which acquired large quantities of exotic raw materials, including obsidian, copper, mica, shark's teeth, and marine shells, in exchange for specialized finished goods such as copper panpipes and ear spools (Stoltman 1978:721). Various theories have been offered to explain the nature of this interaction, some emphasizing socioreligious systems and others pointing to economic networks, but the problem remains unresolved. Within the Lower Mississippi Valley, the culture that participated in this interaction sphere is termed Marksville.

Toth (1988:211-213) has argued that Marksville culture developed out of Tchefuncte as a result of intermittent contacts with cultures in the Illinois River valley area, but he only speculates on the nature of these contacts. He emphasizes that the evidence for Hopewellian interaction is largely limited to the Marksville mortuary system and aspects of ceramic decoration. Other cultural subsystems, such as subsistence and settlement pattern, may have changed very little. Economic data from Marksville sites are extremely limited, but information from contemporary occupations in the Midwest suggests a pattern of intensive collecting of wild plant foods and high density faunal resources, such as fish, supplemented by cultivation of native North American seed plants and a few tropical cultigens (Asch et al. 1979). Present evidence indicates that maize was either not present at this time or of only minor importance.

It is for the Marksville period that the first large-scale evidence of sites in the study area can be found (Altschul 1978; Gibson 1978b; McIntire 1958; Phillips 1970; Weinstein et al. 1978). Principal among these are the Gibson Mounds (16TR5) and Mandalay Plantation (16TR1). As noted earlier, Phillips (1970) designated Mandalay Plantation as the type site of the Mandalay phase. With the creation by Toth (1977, 1988) of the Jefferson Island phase as representative of the general area's early Marksville phase, Weinstein et al. (1978) reduced Mandalay to the late Marksville period. At present, only a portion of the assemblage from the Gibson Mounds (Weinstein et al. 1978) can be unequivocally assigned to the early Marksville period. Similarly, although there are many mounds in the area, it is not presently possible to assign them to any but the very latest Coles Creek and Mississippi periods.

A good percentage of late Marksville sites exist in the study area. Many of these were initially identified by McIntire (1958:Pl. 5) as Troyville in age, but have been reassigned to the late Marksville period on the basis of revised ceramic analysis (Weinstein and Gagliano 1985:141-142, Fig. 7). Most of these sites are associated with the du Large, Marmande, and Mauvais distributary channels, although four sites (16TR4, 16TR47, 16TR76, and 16TR77) are located on the possible relict beach ridge near Lake Penchant (Weinstein and Gagliano 1985:Fig. 7). Some of the best evidence for a late Marksville component in the study area comes from Gibson's (1978b:Table 16) test pit into the Oak Chenier site (16SMY49) near the junction of bayous Chene and Penchant. The lower levels of the pit (35-75 cm) yielded decorated ceramics only of the late Marksville period: Marksville Incised, *var. Yokena* and Marksville Stamped, *var. Manny*. These levels also produced a flexed, human burial (Gibson 1978b:129, Fig. 28).

Baytown Period, A.D. 400-700

The period following the Hopewellian florescence has been characterized as a time of cultural decline throughout much of eastern North America

(Griffin 1967:187). This is certainly implied in Phillip's (1970:901) statement that ceramic decoration was "at a remarkably low ebb" during this period in the Lower Mississippi Valley. Recently, however, a number of researchers have suggested that the apparent decline may not have been as pervasive as previously believed. In the Midwest, Braun (1977) and Styles (1981) have argued that this period, in contrast to earlier interpretations, was a time of population growth and increased regional social integration. Along the Florida Gulf coast an elaborate culture called Weeden Island developed during this time (Milanich and Fairbanks 1980:89-143). Even in the Lower Mississippi Valley, new data indicate that the Baytown period was marked by the appearance of two painted pottery complexes (Belmont and Williams 1981). The earlier complex, termed the Quafalorma horizon, developed during the Troyville subperiod and exhibited striking similarities to early Weeden Island ceramics. The later complex, called the Woodville horizon, characterized the Deasonville subperiod and was less elaborate. The remainder of the ceramic assemblage of the Baytown period consisted of a large quantity of Baytown Plain and smaller amounts of decorated types such as Mulberry Creek Cordmarked, Salomon Brushed, and Alligator Incised.

Changes were also occurring in the stone tool tradition during this period. Small arrow points began to replace dart points, reflecting a transition from the atlatl to the bow and arrow. Subsistence data from the Lower Mississippi Valley are limited for this period, but in the Midwest, Styles (1981) has identified a pattern of intensive, localized collecting of wild plant and animal resources supplemented by increased cultivation of both North America and tropical cultigens. Mound building continued in the Baytown period, and there are indications that a shift from a mortuary function to a building substructure began toward the end of this time (Rolingson 1982).

Much like the remainder of south Louisiana, the Troyville-like culture present within the study area during Baytown times is poorly understood. To date, most sites yielding examples of painted pottery on a Baytown Plain paste have been assigned to this time frame. As can be seen by Figure 4-1, however, this leaves little room for fine-scale cultural differentiation, and the Whitehall phase, named for the Whitehall site (16LV19) on the Amite River (Phillips 1970; Weinstein 1974), remained the sole phase representative for all of southeast and south-central Louisiana until recently.

Kidder et al. (1995) have suggested that Whitehall be limited to that area north of the Barataria Basin, and have established the Grand Bayou and Des Allemands phases for coastal Louisiana. The earlier phase, Grand Bayou, is represented by ceramics similar to the Troyville types seen at the Greenhouse site (16AV2) and in the Tensas Basin. These include Marksville Incised, *vars. Anglim* and *Vick*, Marksville Stamped, *var. Baton Rouge*, Larto Red and late varieties of Churupa Punctated. Grand Bayou phase components have been identified at 16SC42, 16SC43, 16SC45 and 16JE60.

The later Des Allemands phase is distinguished by the lack of Marksville Stamped and Incised, continued red filming, the appearance of Evansville Punctated, Hollyknowe Pinched and Mazique Incised, *var. Bruly;* the Weeden Island-like Woodville Zoned Red, and early varieties of French Fork Incised; and the "six mile" rim treatment. Single line varieties of Coles Creek Incised also begin to appear during this phase. 16JE60 is considered the type site for the Des Allemands phase. The Gibson Mounds (16TR5), where Weinstein et al. (1978:Tables 29-30, Fig. 63) reported a ceramic assemblage composed of Coles Creek Incised, *var. Stoner*, Larto Red, *vars. Larto* and *Silver Creek*, Mazique Incised, *var. Bruly*, Woodville Zoned Red, *var. Woodville*, French Fork lugs, and Evansville Punctated, *var. Amite* (Phillips' [1970] "six-mile treatment"), as well as numerous varieties of French Fork Incised, apparently dates to this phase.

At Richeu Field (16TR82), a low, pyramidal mound on the Teche-Mississippi natural levee about 1.5 mi (2.4 km) southwest of Gibson, Weinstein et al. (1978:Tables 38-39) recovered sherds of Larto Red, *var. Larto*, Evansville Punctated, *var. Amite*, and several rims of Baytown Plain, *var. Troyville.* This site, probably a small hamlet associated with the more prominent village at Gibson, could contain components from both Grand Bayou and Des Allemands phases.

Coles Creek Period, A.D. 700-1200

Elsewhere in eastern North America this time interval corresponds to the latter portion of the Late Woodland period and the beginning of the Mississippi period. Within the Lower Mississippi Valley, a cultural florescence that shows a marked resemblance to Weeden Island culture of northwest Florida occurs during this period. The precise nature of the

relationship of Coles Creek culture to Weeden Island is uncertain, but the similarities in ceramic decoration and community pattern are unmistakable. Both were characterized by the use of incised, stamped, and punctuated pottery types in which the decorative zone is largely restricted to a band around the rim of the vessel, and by the construction of small platform mounds around plazas. The latter are generally interpreted as an indication of the development of stratified social systems during this period. These societies were apparently based on economies that included the cultivation of maize. While direct evidence for this is lacking from sites in the Lower Mississippi Valley, the remains of corn have been recovered from Weeden Island sites (Milanich and Fairbanks 1980:127) and from contemporary Late Woodland sites in the Midwest (Styles 1981).

Coles Creek period sites are relatively common within the study area, 24 of which having been plotted by Weinstein and Gagliano (1985:Fig. 9), and can be related to one or more of three temporally sequential phases for the region: Bayou Cutler, Bayou Ramos, and St. Gabriel. While the Bayou Cutler phase (established by Phillips [1970], based on data from Kniffin [1936] and McIntire [1958]) and the St. Gabriel phase (set up by Brown [1985b] on data supplied by Woodiel [1980]) are situated primarily east of the study area, the Bayou Ramos phase is centered squarely within it. As noted, this phase was created by Weinstein et al. (1978) using data from two test pits at the Bayou Ramos I site (16SMY133) located at the junction of Bayou Ramos and Bayou Boeuf.

As with most other phase designations, it is the various ceramic types and varieties which serve to separate the Bayou Ramos phase from its earlier and later Coles Creek counterparts. Bayou Cutler components can be recognized by many of the classic Coles Creek ceramic types and varieties: Coles Creek Incised, *vars. Coles Creek* and *Athanasio*; Mazique Incised, *var. Mazique*; Pontchartrain Creek Stamped, *var. Pontchartrain*; and French Fork Incised. Bayou Ramos components can be identified by sherds of Coles Creek Incised, *var. Mott*; Mazique Incised, *var. Kings Point*; Beldeau Incised, *var. Beldeau*; Avoyelles Punctated, *var. Avoyelles*; and Pontchartrain Check Stamped, *var. Tiger Island.* The St. Gabriel phase can be recognized by sherds of Coles Creek Incised, *var. Hardy*, Mazique Incised, *var. Manchac*, Evansville Punctated, *var. Wilkinson*, Harrison Bayou Incised, *var. Harrison Bayou*, and minor quantities of Plaquemine Brushed, *var. Plaquemine* (Brown 1985b; Weinstein 1987b).

The latter phase is represented in the general study area by two excavated sites, Thibodaux (16AS35) and Goat Island (16SMY1). At Thibodaux, Weinstein et al. (1978:34-55) excavated a stratified shell midden along Bayou Boeuf in which one of the lower strata produced *Rangia* shell that was dated to 975 ± 60 B.P.:A.D. 975. It contained sherds of Plaquemine Brushed, *var. Plaquemine*; Mazique Incised, *var. Manchac*; and Addis Plain, *var. Addis.* At Goat Island, Goodwin et al. (1985a:108-110) received excellent St. Gabriel phase radiocarbon dates (840 ± 45 B.P.:A.D. 1110, 860 ± 130 B.P.:A.D. 1090, and 810 ± 80 B.P.:A.D. 1140) from a shell midden which produced only plain unidentified pottery.

Mississippi Period, A.D. 1200-1700

The last prehistoric period in eastern North America witnessed the development of chiefdom-level societies based on intensive cultivation of maize, beans, and squash. Perhaps the most dynamic of these societies appeared in the Middle Mississippi Valley between A.D. 900 and A.D. 1050. Referred to as Mississippian culture, it was characterized by a shell-tempered ceramic industry and a settlement pattern including large mound centers and nucleated habitation sites that were often fortified (Stoltman 1978:725). During the first centuries of the second millennium A.D., this culture spread rapidly along the major river valleys of this portion of the continent. The nature of this expansion, either by movement of people or diffusion of ideas, is still debated, but by A.D. 1200 Mississippian culture was found as far south as northern Mississippi and as far east as Georgia.

In the Lower Mississippi Valley, Mississippian culture encountered an indigenous non-Mississippian culture, and a hybridization of the two occurred. Phillips (1970) considered the resident culture to have been Plaquemine, an outgrowth of Coles Creek culture, which began about A.D. 1000. He viewed the interaction between Mississippian and Plaquemine culture as resulting in gradual changes in the Plaquemine ceramic tradition and settlement pattern. Later in the period, after A.D. 1400, an actual intrusion of Mississippian groups displaced the resident Plaquemine groups. Recently, Brain (1978) has offered a somewhat different interpretation of this sequence of events. He argues that the Lower Mississippi Valley culture that experienced the initial Mis-

sissippian contact about A.D. 1200 was Coles Creek, and that the resulting hybridization produced Plaquemine culture. The remainder of the period saw a gradual increase in Mississippian influence, at least in the Yazoo Basin, until about A.D. 1400 when a full Mississippian cultural pattern was achieved in the Lake George phase (Brain 1978:362; Williams and Brain 1983). Brain's reinterpretation of the cultural sequence has resulted in a shift in the established chronologies. Phases such as Crippen Point and Preston, which were formerly considered Plaquemine culture manifestations of the early Mississippi period, are now placed late in the Coles Creek period and assigned to a transitional Coles Creek culture. The latter now persists until A.D. 1200 and includes a number of changes in ceramic technology that had previously been considered indicators of Plaquemine culture. If Brain is correct, then Plaquemine culture throughout the Lower Mississippi Valley should postdate A.D. 1200 and presumably appear at progressively later times at increasing distance from the Yazoo Basin.

While disagreeing somewhat on the origin of Plaquemine culture, all authorities concur that it exhibited numerous continuities with the preceding Coles Creek culture. Several of the Plaquemine ceramic types appear to be direct outgrowths of Coles Creek types. There are some changes, however, including the addition of small amounts of finely ground shell and other organic matter to the pottery and the extension of the decorative field to include the body of the vessel. Mound construction continued on an even greater scale than in the previous period. The mounds became larger, there were more at each site, and there were more sites. Intensive agriculture is presumed to be the economic base on which this florescence was built, but there is presently little direct evidence of it in the Lower Mississippi Valley.

In the coastal zone of Louisiana, Gibson (16TR5) contains a well-pronounced Plaquemine ceramic assemblage (Weinstein et al. 1978), and it is highly likely that the impressive Berwick Mounds, described by Cathcart (Prichard et al. 1945), represented a major Plaquemine center. Coupled with these are smaller, isolated mounds, possibly representing minor villages in the Plaquemine political system. Sites such as Fairview Plantation Mound (16SMY148) (Collins 1927; Weinstein et al. 1978), Marmande Plantation (16TR19) (Altschul 1978; McIntire 1958) and 16TR96 (Altschul 1978:205-206), are representative of this group within the present study area. Similarly, numerous shell middens with Plaquemine components are known throughout the region (Altschul 1978; Gibson 1978b; McIntire 1958; Weinstein et al. 1978; Weinstein and Gagliano 1985; Weinstein and Kelley 1992) and probably served as seasonal collecting locales for the residents of the more permanent mound sites.

Three regional phases of early Plaquemine culture occur to the east, west, and north of the study area (see Figure 4-1). The first of these is the Medora phase, established by Gagliano (1967) on the data supplied by Quimby (1951) from the WPA-era Medora site (16WBR1) excavations in West Baton Rouge Parish. Medora is, in fact, the type site of the entire Plaquemine culture, and typical ceramics include: Plaquemine Brushed, Coles Creek Incised, *var. Hardy*; Mazique Incised, *var. Manchac*; L'eau Noire Incised; Medora Incised; Anna Incised, *vars. Australia* and *Evangeline*; and Pontchartrain Check Stamped.

The second Barataria phase, proffered by Holley and DeMarcay (1977) for sites within the Barataria Basin, principally along bayous des Familles and Barataria, is based on excavations by the Delta Chapter of the Louisiana Archaeological Society at the Fleming site (16JE36). This phase is present in the eastern coastal zone of Louisiana, while Medora is generally located in interior areas (Kidder et al. 1995). Barataria can be distinguished from Medora by the lack of Plaquemine Brushed and the presence of Southern Cult motifs. The strongest representation of cult designs appears on pottery in the Barataria Basin (Holley and DeMarcay 1977:16; Weinstein 1987b). Other Southern Cult items include fragments of carved stone discs from the Rosedale (16IV1) and Shellhill Plantation (16SJ2) sites (Weinstein 1987c).

The third phase is Burk Hill, identified by Brown (1982) on the basis of material from the Burk Hill site (16SMY100) on Cote Blanche Island. This site was first recorded by Lanier Simmons in 1966 and revisited in 1979 during Harvard's Lower Mississippi Valley Petite Anse Project (Brown et al. 1979:30-31). The ceramics recovered (primarily Coles Creek Incised, *var. Hardy* and Plaquemine Brushed, *var. Plaquemine*) indicated occupation during a transitional Coles Creek/Plaquemine phase.

Contact Period

By A.D. 1500, new influences began to be felt in the Louisiana coastal zone, as aboriginal groups began to take on the appearance, at least in material

culture, of the peoples encountered by the early French explorers. This late Plaquemine culture is recognized by one rather overextended phase, called Delta Natchezan. Created by Phillips (1970), this phase includes all south Louisiana sites with ceramics similar to those recorded for the protohistoric and historic Natchez. The type site for this phase is Bayou Goula (16IV11), the assumed location of the historic Bayogoula, excavated during WPA days and reported on by Quimby (1957).

Principal ceramic markers of the Delta Natchezan phase include Fatherland Incised, *vars. Fatherland* and *Bayou Goula*, and those versions of Addis Plain that contain small amounts of shell, *vars. Greenville* and/or *St. Catherine* (Quimby 1957:121-128; Brain 1969; Brown 1985a; Phillips 1970; Steponaitis 1974). Mazique Incised, *var. Manchac* and Plaquemine Brushed may be considered minor elements in the assemblage, as well. A small spattering of shell-tempered Mississippian sherds also was noted at Bayou Goula, principally the types Mississippi Plain and Pocahontas Punctated. The presence of minority amounts of shell-tempered pottery at other Delta Natchezan sites, such as Isle Bonne (16JE60) and Fleming in the Barataria region (Holley and DeMarcay 1977; Gagliano et al. 1979), argue for a great deal of interaction between the resident Plaquemine peoples and the advancing Mississippians to the north and east.

In the study area, the presence of small amounts of shell-tempered pottery has been recorded by many investigators (Altschul 1978; Gibson 1978b; McIntire 1958:Pl. 13; Weinstein et al. 1978), and these may reflect ties not only to the Mississippian peoples of the Bayou Petre phase to the east, but to what apparently was a small enclave of Lower Valley Mississippians (the Petite Anse phase) who resided on and adjacent to Avery Island (Brown et al. 1979). It has been suggested that this group presumably came to Avery Island to exploit the salt deposits found there and to either trade or carry the salt to the north (Brown et al. 1979).

Within the study area, one Delta Natchezan component has been excavated. At the Thibodaux site (16AS35) on Bayou Boeuf, the upper two midden levels of Test Pit 1 yielded sherds of Fatherland Incised, *vars. Fatherland* and *Bayou Goula*; Maddox Engraved, *var. Emerald*; Plaquemine Brushed; and Addis Plain, *vars. Addis* and *Greenville* (Weinstein et al. 1978:Table 2). Radiocarbon assays on these midden levels produced dates of 515 ± 60 B.P.:A.D. 1435 and 460 ± 60 B.P.:A.D. 1490, dates whose sigmas overlap the assumed beginning of the Delta Natchezan phase.

The principal aboriginal groups encountered by European explorers in the vicinity of the study area were the Chitimacha and the Washa or Ouacha. The first recorded contact with one of these groups occurred in March of 1699 when Iberville ascended the Mississippi River (McWilliams 1981:58). One and a half leagues beyond its junction with Bayou Lafourche, which his Indian guide called the Ouacha River, he came upon two canoes, one containing four Bayagoula and the other containing five Ouacha men and two women. The latter were returning to their village, two days travel from there. La Harpe, in *The Historical Journal of the Establishment of the French in Louisiana*, states that the village was located on Bayou Lafourche near those of the Chitimacha and Yagnechitou (de La Harpe 1971:11). He also records that Bienville attempted to visit the Ouacha village in September of 1699. In that entry the village's location is given more precisely as 12 leagues down Bayou Lafourche and one quarter of a league inland (de La Harpe 1971:15). Swanton (1911:298) places it in the area of present-day Labadieville.

The next reference to the Ouacha occurs in 1718 when Penicaut notes that they moved from their former village and settled on the west bank of the Mississippi 11 leagues above New Orleans (McWilliams 1953:219). They apparently occupied, or at least controlled, the area back from the river, as well, for in 1744 Claude Joseph Villars Dubreuil purchased a large tract of land located on the west side of Lake Salvador (also called Lake Washa) from the Ouacha and an allied group the Chaouacha (Hunter et al. 1988:31). Not long after that the Ouacha seem to have disappeared as a separate tribal group.

There is considerably more documentary information on the Chitimacha, who retain their tribal identity today. Their first contact with Europeans apparently occurred in 1702, for La Harpe notes that in August of that year Bienville learned of a raid on the Chitimacha by a group of Canadians and Indians led by St. Denis (de La Harpe 1971:41). This marked the beginning of a long period of hostilities between the Chitimacha and the French. In 1706 a group of Chitimacha, having failed in an attempt to attack the Bayagoula, killed the priest St. Cosme and three other Frenchmen somewhere on the Mississippi River (de La Harpe 1971:54). Bienville

immediately asked the other Indian groups of the region to join in a war on the Chitimacha, and in March of 1707 St. Denis led a party of French Canadians, Bayagoulas, Biloxis, Chaouachas, and Natchitoches against a Chitimacha village. According to Penicaut the village was located on a lake near Bayou Lafourche (McWilliams 1953:71). He further states that 15 Chitimacha were killed and 40 were taken as prisoners.

Raids between the Chitimacha and Indian groups allied with the French continued until 1718 when Bienville made peace with the tribe, apparently at the request of Dubuisson, the manager of the French concession located on the Mississippi River at the old Bayagoula village (McWilliams 1953:216-219). Under the terms of this agreement, the Chitimacha were to abandon their village on or near Bayou Lafourche and settle on the Mississippi one league below the concession. Penicaut states that they moved to the new location two weeks later, and, in fact, maps of the period show a Chitimacha village in that area (Giardino 1984:253).

Swanton (1911) questions whether this represented the entire tribe or simply one portion of it. In 1739, a French officer with the De Nouaille party reported that the Chitimacha settlement on the Mississippi was relatively small because most of the tribe lived with the Atakapas (Swanton 1911:343). After that there are few references to the Chitimacha until the late-eighteenth century. In the 1770s Thomas Hutchins, at that time a cartographer in the British army, noted that there was a Chitimacha village located on Bayou Lafourche six leagues from its junction with the Mississippi River (Hutchins 1968:40). He also mentioned two other villages that probably represent Chitimacha settlements located on Bayou Teche. One of these, known as Mingo Luoac or Fire Chief, was situated 10 leagues above the mouth of the bayou and the other, called the village of Soulier Rouge or Red Shoes, was located three and a half leagues farther up (Hutchins 1968:46). Goodwin et al. (1985b:207) place the first village on the east side of Irish Bend and the second in the vicinity of modern-day Charenton, the present location of the Chitimacha reservation.

By the early-nineteenth century the Charenton settlement seems to have become the principal village on Bayou Teche. The Cathcart and Landreth expedition of 1819 described it as a row of palmetto-covered cabins, each 50 to 100 yards apart extending for almost 3 mi along the bayou (Newton 1985:108). They also noted two smaller Indian settlements in this area: one a hunting and fishing camp located on Grand Lake near Charenton, and the other, known as Position's settlement, consisting of three huts located on Berwick Island on the shore of Six Mile Lake (Newton 1985:52-53; 126-127; Prichard et al. 1945:781-782, 837). The expedition recorded another Indian village, this one under the chief Jean Champlain, on Bayou Plaquemine in the eastern portion of the Atchafalaya Basin (Newton 1985:16; Prichard et al. 1945:760). Although Cathcart and Landreth do not identify it as a Chitimacha settlement, Gibson (1980:3-7), using land claims data, indicates that the occupants were Chitimacha. He also documents the presence of a second Chitimacha village of this period on nearby Bayou Jacob (Gibson 1980:7-10).

In the 1880s Gatschet conducted ethnographic research among the Chitimacha at Charenton and obtained a list of 15 historic villages (Gatschet 1883). Swanton later added to this list on the basis of his own research in 1907 and 1908 (Swanton 1911). Most of these settlements were located along Bayou Teche or on small streams in the Atchafalaya Basin, but three were situated on or near Bayou Plaquemine. Goodwin and Associates, Inc., conducted limited test excavations at an archaeological site (16SMY12) believed to represent one of the settlements recorded by Gatschet and Swanton, *Co'ktangi ha'ne hetci'nc* or "Pond-lily worship house" (Goodwin et al. 1985b:209-213). The small collection of aboriginal ceramics recovered in these excavations include a mixture of late Plaquemine and Mississippian types. Also present were six glass beads and a number of sherds of pearlware.

CHAPTER 5

HISTORIC BACKGROUND

Two studies by Gibson (1982) and Goodwin et al. (1985a) have provided excellent and detailed summaries of the history of the Atchafalaya Basin, while Beavers et al. (1984) and Brown et al. (1997, 2000) summarize the Lafourche-Terrebonne Parish region. This section, therefore, will provide only a brief overview of the present study area.

The history of European settlement of south Louisiana begins with La Salle's voyage to the mouth of the Mississippi River in 1682, and Iberville's ascent up the Mississippi River in March 1699. Although the Gulf coast area had previously been claimed for the King of Spain in the sixteenth century by Spanish explorers, their sole interest in the territory lay in its potential for providing treasure, and no attempts at colonization were made. After Iberville's initial establishment of Forts Maurepas, de la Boulaye, and St. Louis de la Mobile, France's strategy for colonization in the early eighteenth century was primarily to bestow private charters upon individuals who were allowed to develop their own lucrative schemes to draw settlers into the area. Plagued by financial troubles, internal strife, and Indian attacks, the speculative ventures of neither Antoine Crozat nor John Law were very successful in populating the colony, and Louisiana remained largely unsettled until the influx of the Acadians late in the eighteenth century.

Following the 1763 Treaty of Paris, ending the French and Indian War, France was forced to forfeit to England all of her possessions east of the Mississippi (except New Orleans). Within a year, however, both New Orleans and the lands west of the Mississippi were publicly transferred to Spain, although a secret treaty, dating back to 1762 had already provided for such an act.

In spite of the domestic furor caused by the land transfer, the change from French to Spanish control was accompanied by a productive change regarding governmental priorities for resource development. The Spanish interest in exploiting the colony's rich agricultural potential was manifest in her land grant policies, which required that the grantees build and maintain levees, bridges, roads and ditches, or else forfeit their holdings.

The earliest Europeans to visit the present-day Terrebonne Parish area were probably French trappers and, prior to 1765, few Europeans had settled there (Watkins 1939). Beginning in that year, large numbers of French-Canadian exiles arrived in Louisiana to escape British rule in Nova Scotia. Being well adapted to the environmental as well as the political climate afforded in French Louisiana, the Acadians settled the land flanking the many rivers and bayous of south-central and southwestern Louisiana. Most of them arrived in the project region

by coming down Bayou Lafourche and across to Bayou Terrebonne. This migration of Acadians continued until about 1795, under the encouragement of the Spanish who had acquired Louisiana from the French in 1763. These Acadian emigrants settled along the fertile natural levee lands along the many bayous in the area and, initially, established small farms. Soon, they spread to most of the habitable natural levee lands in the region and, in addition to farming, added stock raising, hunting, fishing and trapping. These early French settlers named the region Terrebonne, which means "the good earth," in recognition of the richness of the area. The earliest families in the project region were Marsh along Bayou Black, Bellanger on Bayou Terrebonne, Prevost on Grand Caillou, Shrivins on Petit Caillou, and Duplantis on the lower Terrebonne and Petit Caillou (Hebert 1978:xxxviii).

The Land

The first evidence of any inhabitants within the general study area come during the Spanish period and includes a coastal survey conducted by Don José Evía in 1785. Entrusted with the task of accurately mapping and recording the Gulf coast from the mouth of the Mississippi River westward to the Rio de Tampico, Evía left Southeast Pass on May 15, 1785, in two schooners, *Grande* and *Chica Besana* (Hackett 1931:352).

On the twelfth day of his survey, Evía rounded "La Ultima" (Last) Island of the Isles Dernieres and began to encounter extensive oyster beds (Hackett 1931:353-354). The following day, Evía noted:

> The thirteenth day dawned cloudy, with a moderate wind from the northeast, and at noon bearings were taken in 28° 47', from a point outside all the shoals. I set sail with a fresh wind from the north-northeast in 6 or 7 feet of water, in order to approach the coast. At half past six in the evening I anchored in six feet over the oyster beds, the point [of land] six miles away bearing to the north-northwest. On the 14th day I remained at anchor in order to locate all the shoals which extended to the Punta del Fierro [Hackett 1931:354].

Evía's "Punta del Fierro" is almost certainly today's Point au Fer. Later, Evía records particulars about the point and adjacent features:

> From the western point of Ultima Island, the oyster banks stretch 16 miles to the southwest, and 10 miles to the south. They can be coasted in two fathoms of water, and if the tide is out, they are visible. To the west- northwest of Ultima Island, at a distance of twelve leagues, is the Punta del Fierro, which forms the entrance to the Rio Chafalaya or Teche. It is known by a grove which is there, the only one in those parts. The coast of this point is separated from the peninsula by two small channels. The most easterly has six or seven feet of water, leading to the Gran Bayu, which has only four or five feet of water. The Punta del Fierro is surrounded by oyster banks for a distance of 10 miles. Coasting them at this distance, an eight-foot channel will be found in the direction of the north-northeast, leading to the Chafalaya, or Teche, the grove on the said point being at a distance, and visible from the mast-head. Sailing toward the east, there will be seen to the north another higher and more extensive one on the peninsula which they call La Bella Island, toward which the prow will be pointed. As soon as the water increases [in depth] one must steer closer to the wind in order to round the island of El Bastion, which is the western part of the said river. To the north of the Punta del Fierro oyster banks extend for five miles, under three and four feet of water, but after entering, there is five and six fathoms [Hackett 1931:358-359].

After examining the oyster shoals for a possible route into the Atchafalaya, Evía recorded:

> . . . I determined to enter the Chafalaya, or Teche. I had been informed that I should find there good *verchas*, people, and everything necessary to enable me to carry out my commission with more exactitude, and with less risk. For these reasons I set sail at 4 o'clock in the afternoon toward the north-northeast, with a fresh wind from the south-southeast. At half past seven I moored one league inside the mouth of the river. The sixteenth day dawned with a fresh wind from the southwest and many storm clouds. I set sail before it and continued to ascend the said river toward the north-northeast, to the first settlement, which is four leagues distant from the mouth of the river. I moored here at noon.
>
> . . . On the seventeenth day I took a pirogue and, with three mariners, ascended as far as Los Atacapas, to the house of the commandant, Don Alexandro de Declouet, which was 35 leagues from the said place. I arrived on the 19th, at

> 1 o'clock. . . On the third day of July, leaving the two schooners well anchored, I set sail at half past four in the morning with two pirogues and two *berchas* well armed and manned. . . . At half-past seven I was out of the river, and continued toward the west-southwest, 5° west, with a cool wind from the east, coasting La Bella Island in eight feet of water [Hackett 1931:355].

Evía eventually continued his survey west along the coast. Upon returning, however, he again entered the Atchafalaya, reclaimed his schooners, and then headed to New Orleans by way of the Atchafalaya, and apparently Bayou Plaquemine. His description of the various waterways and travels is included in the following:

> Through this river (the Chafalaya), the Mississippi empties when it is swollen, by way of a bayou which they call La Fouche, opposite Manchac. This causes it to have a strong current, fresh water being encountered four leagues out to sea. To this point . . . I made this voyage with two schooners, but it being impossible to carry out the inspection of the rest of the bay of San Bernardo with them, I entered the said Rio Chafalaya in order to get pirogues and more men, which I did, leaving the two schooners there.
>
> On my return I passed through the said bayous with them to the Rio Mississippi, by which I descended to New Orleans. The said Rio Chafalaya (it is called also Teche) is quite large and is settled for forty leagues, as far as the Atacapas and Opelusas, where there is a commandant appointed by the governor of New Orleans [Hackett 1931:359].

Although Evía mentions numerous settlements in the region, most appear to be along Bayou Teche west of the present study area. However, a map compiled by Don Juan De Langara in 1799, using the detailed charts and notes supplied by Evía, shows individual settlements along the west bank of the Atchafalaya (Figure 5-1). Two open circles are shown at locations that today would probably coincide with the town of Berwick and a point slightly to the north, possibly up the Teche. The lowermost circle is labeled "1ª Havitacion" or first habitation and probably represents the residence of Thomas Berwick, Sr., a native of Philadelphia who came to the Opelousas district in the 1760s as a surveyor (Trammell 1986:10-11). Berwick helped lay out the towns of Opelousas and New Iberia before moving to the Lower Atchafalaya River. Berwick Bay was named for him. Thomas Berwick died in 1789, and in 1797 his wife, Eleanor, and youngest son, Joseph, were granted a tract of land on the east side of the Atchafalaya. Eleanor and Joseph Berwick's land grant was located on Tiger Island.

It is somewhat more difficult to identify the northern habitation shown on the De Langara map. Perhaps it can be related to either Peter Henry Renthrop, who, in the early 1800s, owned and operated a ferry at the junction of the Atchafalaya River and Berwick Bay, or to John Muggah, a plantation owner and innkeeper located along the Lower Atchafalaya River near today's Patterson (Prichard et al. 1945:771, 795-796). There is evidence, however, which suggests that both of these men may have been relatively recent (early 1800s) arrivals in the area, and may not have been there in 1785 (Prichard et al. 1945:771, 795).

During the late 1700s, groups of Houma Indians began moving down Bayou Lafourche from their settlements on the Mississippi River near Burnside. This tribe had previously moved to Burnside from the Baton Rouge area (via Bayou St John at New Orleans) between 1709 and 1718 (Swanton 1911:289-291). Whether the Houma displaced some of the resident Chitimacha groups on Bayou Lafourche or simply occupied an area already abandoned by the Chitimacha is not clear. However, given the fact that major Chitimacha settlements are known to have existed along bayous Teche and Plaquemine in the late eighteenth and early nineteenth centuries, it seems likely that the lands of the study area had been abandoned earlier by the Chitimacha in favor of these two locations.

The Houma settled initially along Bayou Terrebonne, principally in and around the present city of Houma. Oral tradition suggests that one main village, called Chufahouma, was established at that time (Bowman and Curry-Roper 1982:22). It is apparent, however, that the Houma were actually scattered across the region surrounding Houma. This is evident by the fact that the tribe filed a land claim with the U.S. government for "a tract of land lying on bayou Boeuf, or Black bayou, containing twelve sections" (Bowman and Curry-Roper 1982:24). Today, the claimed land is situated along that stretch of bayous Black and Boeuf between Houma and Morgan City. The claim was rejected, however, in 1814, on the grounds that an Indian tribe could not claim land that had reportedly been given them as a donation (Bowman and Curry-Roper 1982:24).

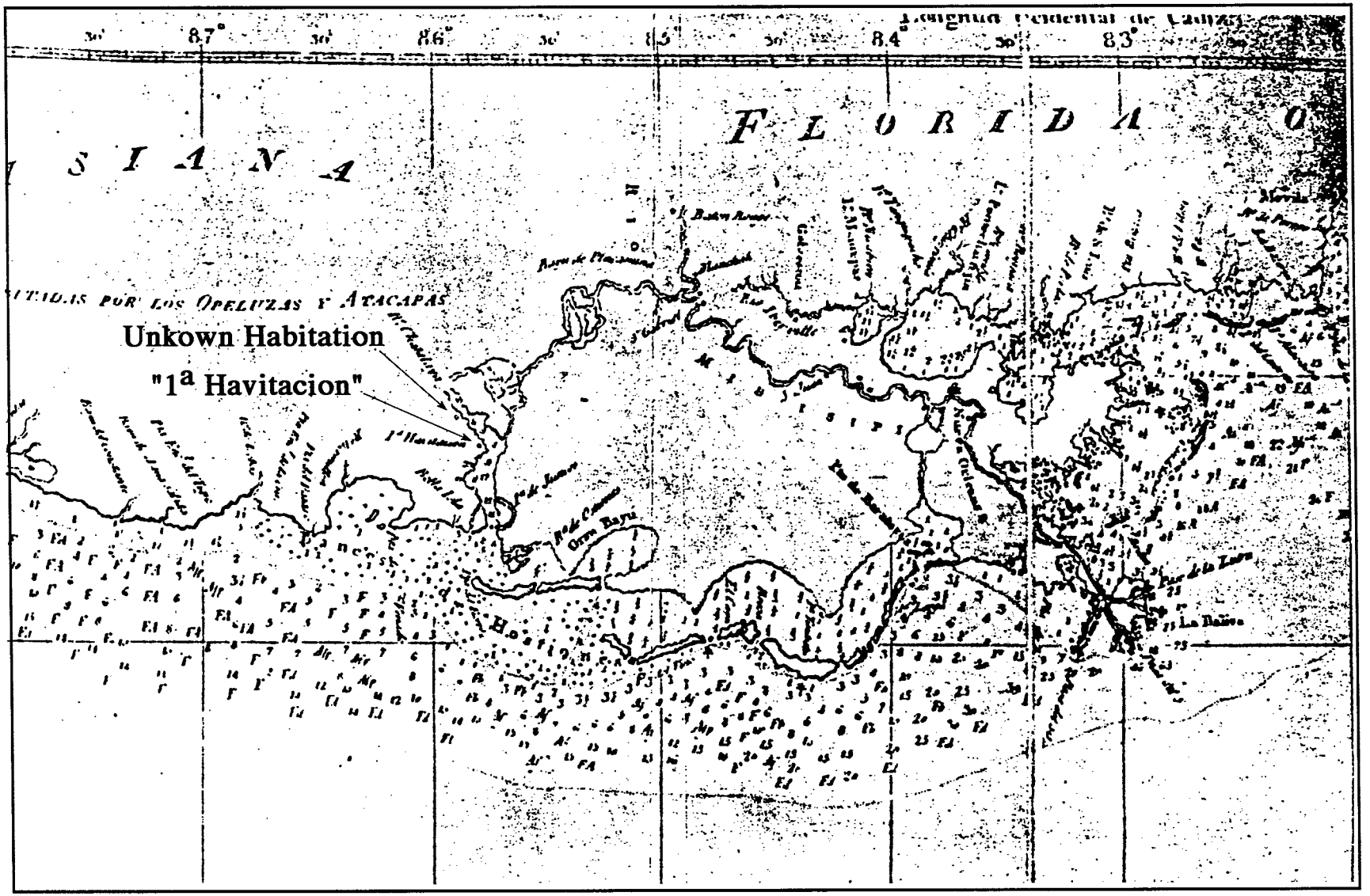


Figure 5-1. Portion of the De Langara map of 1799, based on the data recorded during Evia's survey of 1785. Note the habitations west of the Archafalaya River (after De Langara 1799, reproduced in Hackett 1931).

Additional evidence suggesting a dispersed settlement pattern comes from those land claims filed by individual Houma which were accepted by the U.S. government. Louis le Sauvage, Jean Billiot and his wife, Marie Nerisse, along with the latter's two sons, Jean, Jr., and Joseph, all were awarded land on lower Bayou Terrebonne which they had been occupying since 1787 or 1788 (Bowman and Curry-Roper 1982:24).

By the early half of the 1800s, individual Houma families or small groups of families had spread from the area around Bayou Terrebonne, east to Point Aux Chenes and west down Bayou du Large (Bowman and Curry-Roper 1982:26). The 1880 census recorded only two Indians in the fourth ward of Terrebonne Parish, but, in fact, almost four hundred "mulattoes" were actually of Native American ancestry (USPCTP 1880). In the Bayou Sale/Four Point community one hundred and twenty-nine mulattoes with the traditional Houma French names were present, notably Verdine, Billiot, Francis, Parfait, and Dion. As pointed out by Bowman and Curry-Roper (1982:27), one of the pilots hired from the Teche area by the Cathcart expedition in 1819 was named Page Bellew (Prichard et al. 1945:771), whose last name they interpret as "Billiot," a common Houma name. Similarly, Cathcart (Prichard et al. 1945:781) noted one Joe Bios (again, probably "Billiot") living at Position's settlement.

Many Houma lived below Bayou Grand Caillou along Bayou Sale and Four Points Bayou in 1880. Thomas Dion, a "mulatto" farmer resided there with his wife and three children (USPCTP 1880). Other heads of households were Alexander Fitch, Alexander Verdine, Jr., Jules Billiot, Alexander Verret, Placide Dion, Marcelline Saulco, Francois Fareot, Louis Billiot, Andrew Verdine, Etiene Gibson, Fredrik Parfait, Florentine Billiot, John Verdine, Auguste Billiot, Raymond Francis, and Louis Parfait. Each of these individuals had large households of five or more (Table 5-1). This community numbered over four hundred, with fifty percent white, forty percent "mulatto," and ten percent black. Another larger community lived at Dulac on lower Bayou Grand Caillou.

By the turn of the twentieth century, several Houma settlements were recorded. In 1907, Swanton (1911:291) noted six locations: Point au Barree, lower Point aux Chenes, Champs Charles (Champs Isle de Jean Charles), lower Bayou Lafourche, Bayou du Large, Bayou Sale, and Bayou Grand Caillou. One of the earliest Indian settlers at Champs Isle de Jean Charles was Carlo Naquin, a Frenchman who married a Houma woman (Roy 1959). The settlement on du Large consisted of 12 to 14 houses of 84 to 98 people (Swanton 1911:291), and was centered around the present community of Theriot (Bowman and Curry-Roper 1982:29-G). By 1941, the du Large settlement had increased to 21 families, and additional Houma were living along Bayou Boeuf near Morgan City (Bowman and Curry-Roper 1982:28). Apparently, there was also an early-twentieth-century settlement on Bayou Mauvais Bois and several "cluster camps" in extreme western Terrebonne Parish (Bowman and Curry-Roper 1982:28, 29-G). Difficulties counting Indians persisted, for in 1910 the census recorded only one hundred and twenty Houma. However, by 1930 the U. S. Census had increased the number of Indians to nine hundred and thirty-six (Sultzman 2000).

Throughout the late 1700s both the population and economy of the region continued to grow, principally in relation to the clearing of the land for agricultural purposes. In 1803, this region was transferred from Spain back to France as the political situation changed through the ascent of Napoleon. However, both France's economic and political situation forced her to abandon much of her New World holdings in an effort to continue her clashes with England. Thus, later in 1803, France sold her immense Louisiana colony to the United States for $15,000,000. Not long after this sale, Anglo-American settlers began to move into the Lower Lafourche area. Many of these individuals acquired large tracts of land and established cotton and, later, sugarcane plantations. As a result, many of the original Acadian settlers removed to more isolated and, often, marginal areas and were forced to engage in other economies, such as fishing and trapping.

Louisiana was admitted to the Union in 1812, withstood the planned British invasion in December 1814 and January 1815 during the closing moments of the War of 1812, and began to prosper as a rich agricultural state. Much of the high natural levees became the location for prosperous sugar plantations. In order to serve the expanding population, both prior to, and after, becoming a state, the region was divided into districts that, in turn, became parishes.

The study area was originally established as a part of the Lafourche District. In 1807, Assumption and Lafourche parishes were created out of the Lafourche District, and later, in 1822, Terrebonne

Table 5-1. 1880 U.S. Census Data from Bayou Sale and Four Points (After USPCTP 1880).

Name	Occupation	Relation	Sex	Status	Race	Age	Birthplace
Jules Billiot	Laborer	Self	M	M	MU	24	LA
Josephine	Keeping House	Wife	F	M	MU	17	LA
Joseph	At Home	Son	M	S	MU	3	LA
Mathile	At Home	Dau	F	S	MU	7M	LA
Florentine Billiot	Laborer	Self	M	M	MU	35	LA
Armilnes	Keeping House	Wife	F	M	MU	30	LA
Octave	Laborer	Son	M	S	MU	13	LA
Florentine	At Home	Dau	F	S	MU	10	LA
Margret	At Home	Dau	F	S	MU	8	LA
Mary Jane	At Home	Dau	F	S	MU	3	LA
Phillip	At Home	Son	M	S	MU	5M	LA
Auguste Billiot	Laborer	Self	M	M	MU	40	LA
Lizzie	Keeping House	Wife	F	M	MU	40	LA
Mary L.	At Home	Dau	F	S	MU	21	LA
Ernest	Laborer	Son	M	S	MU	23	LA
George	Laborer	Son	M	S	MU	17	LA
Elvira	At Home	Dau	F	S	MU	15	LA
Mary L.	At Home	Dau	F	S	MU	12	LA
Leon	At Home	Son	M	S	MU	8	LA
Lavise	At Home	Dau	F	S	MU	7	LA
Susan	At Home	Dau	F	S	MU	6	LA
Mathile	At Home	Dau	F	S	MU	5	LA
Henry	At Home	Son	M	S	MU	2	LA
Louis Billiot	Laborer	Self	M	M	MU	45	LA
Louisa	Keeping House	Wife	F	M	MU	31	LA
Felix	Laborer	Son	M	S	MU	18	LA
Marcell	Laborer	Son	M	S	MU	14	LA
Victor	Laborer	Son	M	S	MU	12	LA
Louisa	At Home	Dau	F	S	MU	7	LA
(Infant)	At Home	Dau	F	S	MU	6M	LA
John	At Home	Other	M	S	MU	8	LA
Abel	At Home	Other	M	S	MU	4	LA

Parish was created out of Lafourche Parish (Beavers et al. 1984; Goodwin et al. 1985a).

While the upper reaches of the parish received some settlers, most of lower Terrebonne remained a wilderness. Michel Theriot did not establish the first plantation on Bayou du Large until 1839. This sugar plantation would later become Theriot, the first town in Terrebonne Parish. As late as 1841, when the Robichauxs settled near Montegut on Bayou Terrebonne, the region was described as "a complete wilderness . . . and nearly all kinds of wild animals abound, deer, bear, etc." (Becnel 1989:12-13).

Two maps from the American period, one by William Darby in 1816 (Figure 5-2) and the other by Captain Poussin in 1817 (Figure 5-3) show sparse settlement in the region. Both maps record the location of "Renthrop's Ferry" at the junction of the Lower Atchafalaya River and Berwick Bay, and "Rice's" along the Atchafalaya at the junction of Bayou Boeuf (see Figure 3-2 for a more accurate location of Rice's Plantation in 1842). Poussin's map also records "Settlements" on "B. Darbone" (Bayou Terrebonne) near the junction of "B. Buffalo" (Bayou du Large). This can only refer to the initial occupation of the Houma vicinity. Although the H.S. Tanner map of 1827 does not show property owners, the bayous Caillou appear as "Lit. Flint River" and "Gr. Flint River" in an odd combination of English and French. "Caillou" means pebble in French.

In 1819, the Cathcart expedition passed through the study area, as discussed earlier in regard to Indian site locations. The journals of the expedition provide additional information on settlements in the region at that time. As noted, several houses, including what may have been the forerunner of Hard Times Plantation, were recorded along La Coup, that section of Bayou Boeuf running roughly north-south between Bayou Chene and Lake Palourde. After turning west on Bayou Boeuf proper, Cathcart noted settlement on "Cowpen Island," today's Avoca Island:

> Cowpen Island . . . lies South, at the entrance from La Coup to B'ou Boeuf where there is a branch . . . which runs SSE into Bayou Derbon . . . & from that to the sea, the SW branch on which we are runs into Berwick bay– Courses SW 1/4, SW 1/2, W 1/4 of a mile, to a plantation own'd by Alex'r Grassier . . . a Frenchman, & his Father in law John Henry . . . a Dutchman . . . [Prichard et al. 1945:791].

Landreth recorded the same segment of the journey as follows:

> . . . we next steer South by West about half a mile in twelve feet Water which brings us to Bayou Buff. the coup or cut through which we have passed is generally eighty yards wide and is a very handsome creek or Bayou . . . now in Bayou Buff we steer South West about half a mile in twenty seven feet water the Land very low on each side some marsh on the right hand side and branch willow no appearance of Live Oak on either side near the end of this reach on the left hand side there is a small Settlement of white people John Henry a Dutchman and Alexander Grosure a Frenchman Lives here the Bayou now bears North west by North and runs about a mile and three quarters in this direction in Eighteen feet Water . . . [Newton 1985:64].

According to Prichard et al. (1945:791, footnotes 235 and 236) the name Grassier does not appear in the *American State Papers*, but John Henry seems to have filed several land claims for property along Bayou Teche which he reportedly received under a Spanish order dated to 1786. Regardless, the location given by both Cathcart and Landreth would place the Grassier-Henry property along the south bank of Bayou Boeuf in Section 47, Township 16S, Range 13E.

After leaving Grassier and Henry, the Cathcart party followed Bayou Boeuf west to Bayou Shaffer. Cathcart noted that the western portion, at least, of "Cowpen" (Avoca) Island was claimed by Rice who lived across Bayou Shaffer on today's Bateman Island (Prichard et al. 1945:792). No mention is made of any other inhabitants on Avoca Island, although a good bit of detail is provided on Bryant's Plantation at present-day Morgan City, on Berwick's Plantation at today's Berwick, and on Renthrop's Ferry (Prichard et al. 1945:792-796). Although technically outside the study area, it is instructive to review Cathcart's description of Renthrop's place, since it was probably quite typical of the small homesteads in the region. Additionally, it provides data on a small, family-run ferry, probably much like others throughout south Louisiana:

> *Sunday* [January] *24th* [1819] Remain'd here to refresh; Mr Renthrop & his Son are Taylors

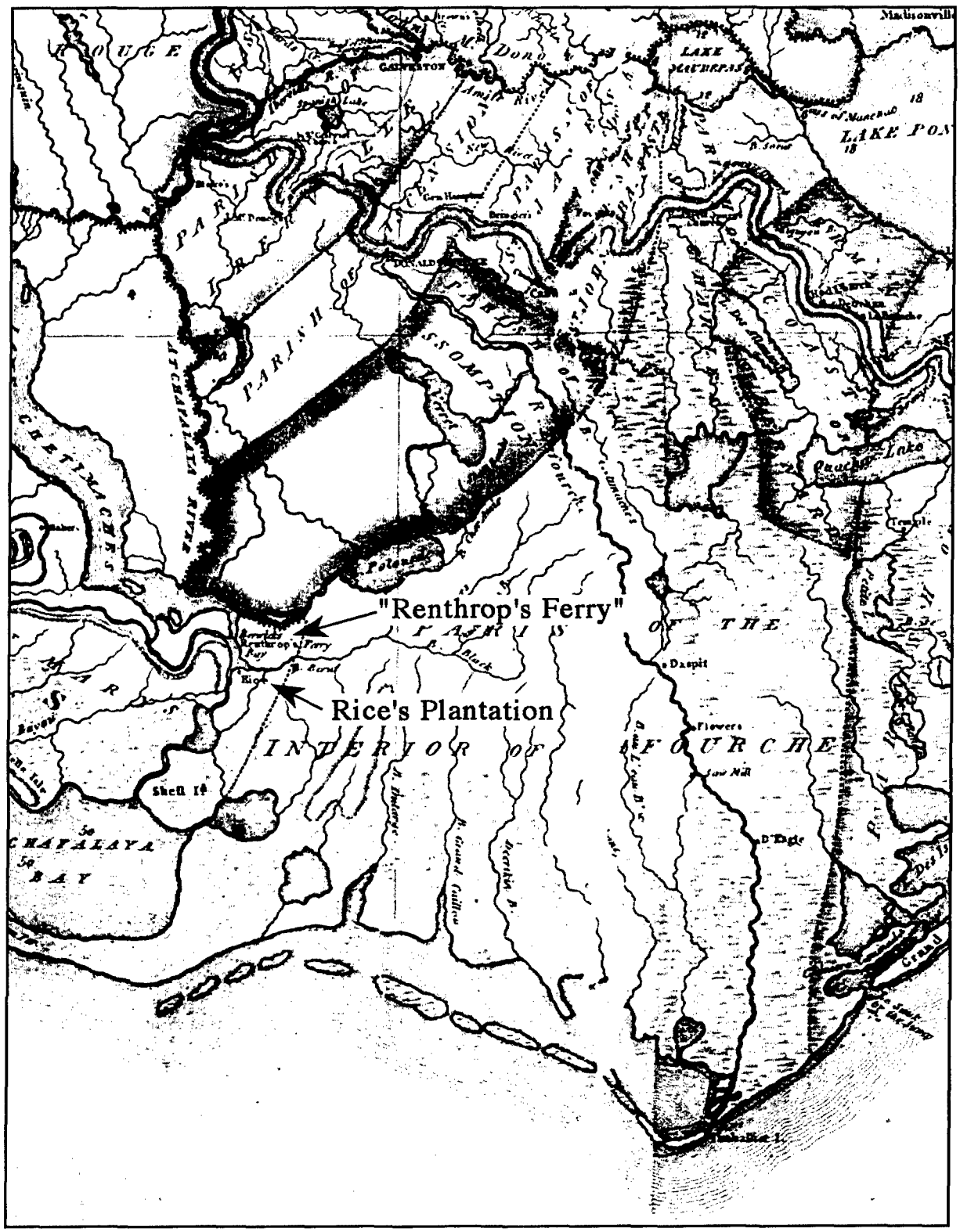


Figure 5-2. Portion of Darby's 1816 map showing "Renthrop's Ferry" and Rice's Plantation (after Darby 1816). Note the lack of settlement along Bayous Black, du Large, and Grand Caillou.

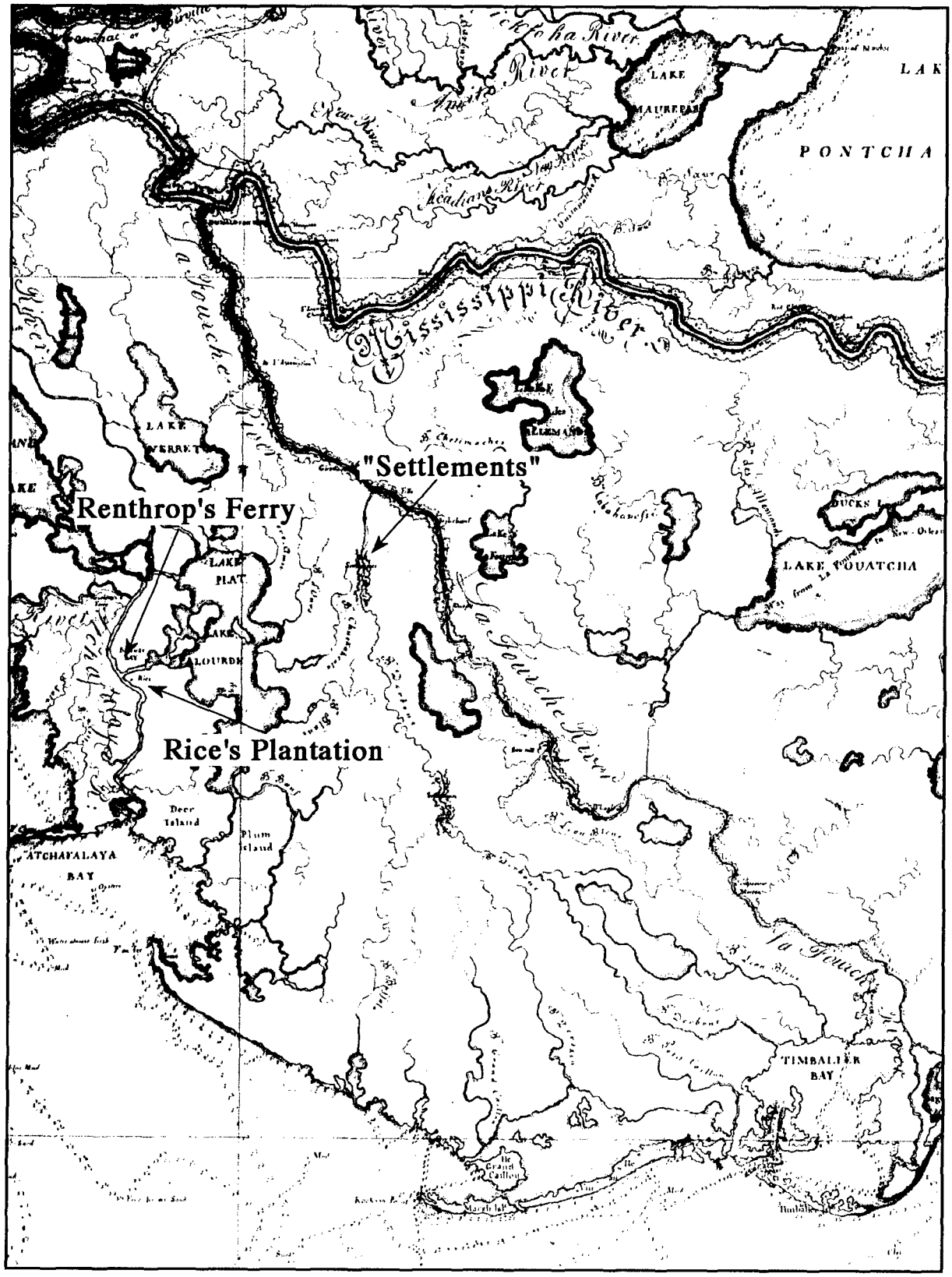


Figure 5-3. Detail of Poussin's map of 1817, showing "Settlements" around the present location of Houma, and Renthrop's Ferry and Rice's Plantation along the lower Atchafalaya River (after Poussin 1817).

> natives of Westphalia, came to Philadelphia some years ago, & have traveld through many places in the United States since, & about . . . nine years ago settled upon this spot, they keep a tolerable good table for this part of the world, their beds are clean, provisions wholesome, liquors Whiskey, taffia & bad claret, they are obliging but wholy Illiterate. Their farm is not very extensive, but their garden is productive, they raise poultry & hogs in abundance, & some fine cattle, & this is the first place we have had milk with our coffee since we left New Orleans; fresh butter . . . is entirely out of the question, & salt . . . cannot be procured except in the City; hogs lard is made its substitute in all culinary purposes, the land everywhere is rich alluvion, capable of producing every necessary of life, & many of the luxuries; but owing to the prevalence of slavery, the whites are lazy, & in general dissipated, & confine themselves to the culture of cotton & sugar . . . alone, because more productive with less labour; The flats (so call'd) used at this Ferry, are form'd of two large canoes, on which is a platform for horses . . . the price of carriage for a man & horse is 12 dollars, & for black cattle 1.50 cs per head . . . they cross the Lake to the canal which runs into Lake Verrett from Lafourche . . . a distance of 30 miles, & from thence passengers proceed to Donaldsonville, & take passage in Steam boats, that pass either up or down the Mississippi, at the rate of 12 1/2 cts per mile . . . . The flats or double canoes, row with two or more oars, & sail when the wind is fair, the rudder is on one canoe only, the pilot sits on the platform, & steers with a yoke & lines, as he would a gig or wherry [Prichard et al. 1945:795-796].

Landreth also added interesting information on Renthrop and his ferry:

> Sunday morning January 24th 1819 at Rentropes. Rentrope is a German and has been several years in this country he keeps a tolerable good House for a new country where regular markets is not established and where supplies cannot at all times be had. here we had milk for our coffee the first we had seen for some time. here they have a great many domestic Fowls Turkeys and chickens &c here I saw what I have not seen in this country before three fine Hogs in a Sty very fat each of which would weigh two hundered and fifty pound but here [illegible] people pretends to make Bacon they generally eat their Hog meat in what they call corn pork. Beef here being their principal dependance which they have very fine in general; Rentrope has a very excellent Kitchen Garden and even the cultivation of a few flowers is not neglected.here the[y] have cabbage full grown and in a growing State still. here they have kale and Spinnage in perfection and the finest Parsley Bed I ever Saw. the Land here is very fine the grass quite green. white clover abounds here and is at this moment fine sheep pasture; Rentrope keeps a Ferry here on the Teche. the Ferry Boats are two connoes fixed about three or four feet apart connected by a platform raised upon them upon which . . . . Platform they carry Horses or cattle as I am told they either Sail or row very well and Some of them carry ten or twelve Horses at atime and they are considered safe Boats. these Boats runs from Rentropes on the Teche across the Lakes to the Laforch canal about thirty miles the price of Ferriage for a single man four Dollars for a man and Horse twelve dollars Rentrope has a son lives at the Laforch Canal who keeps a Tavern and Boats so that there is seldom any detention upon either side the time of passing depends upon the wind and the current &c and takes from Seven or Eight hours to twelve or fifteen. here at Rentropes we rest on Sunday-here is all kinds of business going on Carpenters at work carts driving about the same as any other Day no respect paid to the Sabath here Rentrope keeps a very good table but his charges like all the rest in this country are very high. you cannot live in any tolerable Tavern in this country for less than two Dollars per Day and seldom for that [Newton 1985:70-71].

After leaving Renthrop's, the party headed down the Atchafalaya, passing Rice's Plantation on the way. Landreth provides a brief description of the location:

> . . . in the Atchafalaya we steer down through what is called Berwicks Bay South South East half East and soon get in Eight and nine feet water and from that to five fathoms we steer this course two miles which Brings us to Rices corner at the mouth of Bayou Buff from whence we take a new departure. here Mr Rice owns a very fine and handsome Island which I am told he has a good Title too on which he has built himself a snug little dwelling House on Bayou Buff and open to Berwicks Bay . . . ornamented with two rows of Orange Trees running nearly down to

> Berwicks Bay and paralel with Bayou Buff Mr Rice has shewn more taste than common here in the arrangment of his Houses and Trees . . . [Newton 1985:70].

It is interesting to note that several of the people mentioned by Cathcart and Landreth filed land claims with the U.S. government following acquisition of the territory in 1803. These are recorded in the *American State Papers* volumes for public lands. By comparing these claims with the original township plat maps of the area, it is possible to identify quite precisely the boundaries of those claims that were upheld. Through a review of the *American State Papers* it also is possible to identify individuals who filed claims which subsequently were rejected. Although in these latter cases, the lack of corresponding locations on plat maps makes it difficult at times to identify the specific piece of property being claimed, information regarding adjacent property owners and nearby topographic features recorded in the claims can sometimes be used to pinpoint the true location. This, then, gives a more accurate picture of the total population of an area. It includes not only those residents for whom claims were validated, but also those people who may have been squatters or who did not have legitimate claims, yet were living on the land.

In the western portion of the study region, the two main stretches of land for which claims were filed include the north shore of Avoca Island, then known as "Cowpen" or "Coupen" Island, and the banks of Bayou Boeuf along La Coup. As noted earlier, Cathcart reported that Rice, whose plantation was situated at the junction of Bayou Boeuf and the Atchafalaya River, had claimed part of Avoca Island. This is confirmed by claims for Sections 30 and 40, Township 16S, Range 12E, and Sections 39, 40, and 41, Township 16S, Range 13E, filed by Samuel Rice, Sr., and Samuel Russel Rice in January 1812:

> No. 346. SAMUEL RUSSEL RICE claims a tract of land, situate in the county of La Fourche, on the bayou Boeuf, containing six hundred and fifty-three and thirty-six hundredths superficial acres, and adjoining on one side land of Samuel Rice.
>
> It appearing that the land now claimed was settled, with the permission of the proper Spanish officer, prior to the 20th day of December, 1803, and that the same was inhabited and cultivated on that day by those under whom the present claimant holds, the Board confirm the claim to the quantity of six hundred and forty acres, and reject the balance.
>
> No. 347. SAMUEL RUSSEL RICE claims a tract of land, situate on the bayou Boeuf, in the county of La Fourche, containing six hundred and fifty- five and eighty hundredths supreficial acres.
>
> It appearing that the land now claimed was settled, by the permission of the proper Spanish officer, prior to the 20th December, 1803, and that the same was actually inhabited and cultivated on that day by those under whom the present claimant holds, the Board confirm the claim to the quantity of six hundred and forty acres, and reject the balance.
>
> No 348. SAMUEL RICE, Sen. claims a tract of land situate in the county of La Fourche, on the bayou Boeuf, at the place usually called Coupen Island, containing six hundred and ninety-four hundredths superficial acres.
>
> It appearing that this land was actually settled, by the permission of the proper Spanish officer, prior to the 20th of December, 1803, and that the same was inhabited and cultivated on that day by those under whom the Claimant holds. Confirmed [Lowrie 1834:363-364].

Eastward, along the north side of Avoca Island, a claim was filed, also in 1812, by John Henry who is almost certainly the same John Henry, the "Dutchman," noted by Cathcart and Landreth several years later:

> No. 272. JOHN HENRY claims a tract of land, situate in the county of La Fourche, on the bayou Boeuf, containing six hundred and fifty-six and forty-five hundredths superficial acres.
>
> The claimant states that he went on this land, with the permission of the proper Spanish officer, some time in the month of July, 1803; but we have satisfactory evidence that the land was never settled until after the 20th of December, 1803, and do therefore reject the claim [Lowrie 1834:365].

Several years later one Robert Martin filed claims for land on both Avoca and Tiger islands. One of

his claims appears to correspond to that of John Henry, whose claim, as just seen, was rejected. Martin, in particular, claimed Sections 43, 45, and 47 on the north shore of Avoca Island, and Sections 42, 44, and 46 on the south shore of Tiger Island, all within Township 16S, Range 13E:

> No. 33. Robert Martin claims a tract of land, situate on the bayou Boeuf, in the county of Lafourche, having a front of forty arpents on said bayou, with a depth of forty arpents, bounded above by land of Pilboro, and below by vacant land.
>
> This land is claimed by purchase under François Flores, in whose favor an order of survey was made by Governor Galvez on the 7th of August, 1777. I am of opinion this claim ought to be confirmed. . .
>
> No. 35. Robert Martin claims a tract of land, situate on the bayou Boeuf, in the county of Lafourche, having a front of forty arpents on both sides of said bayou, with a depth of forty arpents, bounded above by lands of Montaran; and below by lands of Dumain.
>
> This land is claimed by right of purchase under Antoine Pilboro, in whose favor an order of survey was made by Governor Galvez on the 2d day of July 1776. I am of opinion this claim ought to be confirmed.
>
> No. 36. Robert Martin claims a tract of land, situate in the interior of Lafourche, on the bayou Boeuf, having a front of thirty arpents on both sides of said bayou, with the ordinary depth of forty arpents, bounded above and below by public lands.
>
> This land is claimed by right of purchase under Jacques Montaran, in whose favor an order of survey was made by Governor Galvez on the 5th of May, 1775. I am of opinion this claim ought to be confirmed [Lowrie and Franklin 1834:581].

Interestingly, questions apparently were raised shortly thereafter concerning the authenticity of Martin's claims. A letter from Samuel H. Harper, of the New Orleans Register's office, to William H. Crawford, Secretary of the U.S. Treasury, dated March 9, 1821, notes the following:

> SIR: In my report on land claims, dated 6th of January last, which I had the honor of transmitting to you, I reported favorably on the following claims, which I have since discovered to be forgeries, viz: Nos. 24, 33, 34, 35, 36, 37, 65, 66, and 67. These claims purport to be founded on orders of survey granted by Governors Miro, Guyoso, Galves, and Carondelet. At the time I received these claims I was much pressed with the business of other claimants; and, besides, they were presented by persons of so respectable characters, to whom they had been transmitted for the purpose, that I did not suspect any fraud was intended; and thus, without minute investigation, I reported in their favor. But since arranging and recording the various land titles presented, I have discovered that the whole of the claims above mentioned are feigned and fraudulant. From a comparison of signatures, and other circumstances connected with the papers, I had no doubt myself of their being forged; but, lest I might be mistaken, I have submitted them to the inspection of several persons, and particularly to former clerks of those governors, who have all concurred in their condemnation. I had always been extremely scrupulous with regard to receiving land titles, and, from the length of time I have been in office, I cannot well be deceived in signatures, several of which I detected on presentation; but, for the reasons above mentioned, I did not bestow the proper attention upon those. I hope, however, that, even if those reports of mine have been adopted by Congress, those spurious claims may be still corrected. So far from wishing them sanctioned, I am determined to prosecute the persons concerned in this nefarious transaction, if, in the opinion of the Attorney General, prosecution can be maintained. Since discovering the frauds practiced on me, I have examined minutely with the translator (who, by-the-by, was not present when these papers were received) every other claim reported on, none of which I have any reason to suspect.
>
> I have the honor to be your obedient servant,
>
> SAM. H. HARPER
> [Dickens and Forney 1860:436].

Harper's reluctance to accept Martin's claims may be supported to some extent by the Cathcart

and Landreth journals, neither of which mention Robert Martin, a name which surely would have been noted had Martin owned or occupied all of the land in question. Apparently, as seen above, Harper's letter did not reach the Secretary of the Treasury in time to prevent Congress' approval, and the claims were, thus, duly included in Lowrie and Franklin's (1834) volume of the *American State Papers.*

Nevertheless, questions regarding the authenticity of the claims remained throughout the early 1800s. This is particularly evident on the original plat map for Township 16S, Range 13E (Newcomb 1842). The plat includes both American survey sections (solid lines) and earlier Spanish (arpent) sections representing Martin's claims (dashed lines). A note on the map states the following:

> The claims of Robert Martin are represented on this map by dotted lines in conformity with commissioners Letter of . . . Mch . . . . See Letter of S. H. Harper, Register dated 9th Mch 18 . . . to the Secretary of the Treasury, asserting the claims to be forgeries [Newcomb 1842].

Either Martin or his heirs must have continued to press for confirmation of the claims, however, and eventually gained their approval, for by 1850 the claims were resurveyed and made an official part of the township. The section lines on today's quadrangle maps match those of Martin's original claims.

Along La Coup, two land claims were confirmed, one by Gregoire Aucoin for Section 37, and one for Jean Baptiste Henry for Section 38, both in Township 16S, Range 13E (Newcomb 1842). The claims are on the east bank of Bayou Boeuf and almost certainly reflect at least two of the inhabitants of that stretch of La Coup noted by Cathcart and Landreth. The names of additional residents along La Coup can be gleaned by further examination of the Aucoin and Henry claims submitted in January 1812:

> No. 279. Gregoire Aucoin claims a tract of land, situate on the bayou Boeuf, in the country of La Fourche, containing four hundred and forty-six and sixty-two hundredths superficial acres, and adjoining on one side to land of François Aucoin.
>
> It appears that the land was actually settled, by permission of the proper Spanish officer, prior to the 20th of December, 1803, and that the same was inhabited and cultivated on that day. Confirmed.
>
> No. 280. Jean Baptiste Henry claims a tract of land, situate in the county of La Fourche, on the bayou Boeuf, containing one hundred and eighty-six and sixty-eight hundredths superficial acres, and adjoining on one side to land of Jean Baptiste Jaunier.
>
> It appearing that the land now claimed was actually settled, with the permission of the proper Spanish officer, prior to the 20th December, 1803, and that the same was inhabited and cultivated on that day. Confirmed [Lowrie 1834:363-364].

Thus, François Aucoin and Jean Baptiste Jaunier occupied land adjacent to Aucoin and Henry. A search of the *American State Papers* shows that François Aucoin's claim (No. 273) was rejected, and a claim (No. 491) filed for land along Bayou Boeuf by Jean Baptiste Janne, who may be the Jean Baptiste Jaunier noted in the Henry claim, also was rejected (Lowrie 1834:365, 367). Other claimants filing for land along Bayou Boeuf had their claims rejected. These include Benoit Goutreau (Claim No. 282), who claimed land adjacent to Jean Baptiste Henry, Michel Deval (Claim No. 294), Jacob Henry (Claim No. 337), William Knight (Claim No. 462), Alexandre Daniel (Claim No. 488), Jean Lagrange (Claim No. 489), who claimed land adjacent to "Bte. Jaunier" (Jean Baptiste Jaunier?), Jean Olivier (Claim No. 490), Etienne Peniçon (Claim No. 493), who claimed land adjacent to Jean Baptiste Henry, and Felix Boudreau (Claim No. 494) (Lowrie 1834:364-367). A joint claim filed by Gregoire Aucoin and Benoit Goutreau (Claim No. 483) was rejected, although, as noted above, Aucoin had a claim approved for another tract of land on Bayou Boeuf (Lowrie 1834:366-367).

The only claim to be approved along Bayou Black in the northern portion of the study area was filed by Robert Martin for a tract located near Houma that includes Section 95 in Township 17S, Range 16E and Sections 103 and 104 in Township 17S, Range 17E (Figure 5-4):

> No. 34. Robert Martin claims a tract of land, situated on the bayou Blake, in the county of Lafourche, having a front of fifty arpents on both sides of said bayou, with a depth of forty arpents.
>
> This land is claimed by purchase under Miguel Saturnino, in whose favor an order of survey was made by Governor Gayoso on the 2d of November, 1798. I am of opinion this claim ought to be confirmed [Lowrie and Franklin 1834:581].

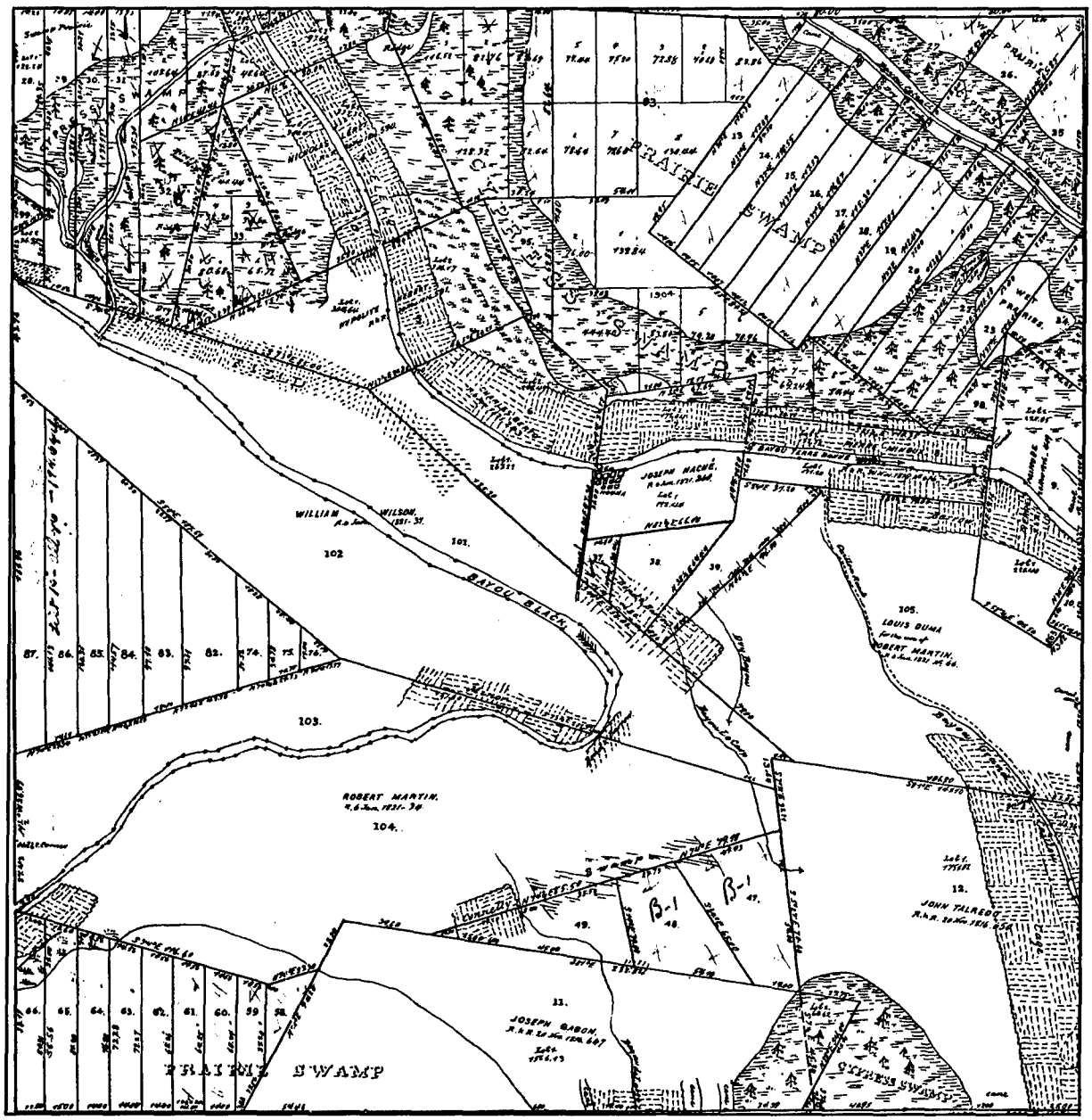


Figure 5-4. Plat map of Township 17 South Range 17 East showing Robert Martin's claim on Bayou Black (McCulloh 1855).

This is the same Robert Martin who submitted the apparently forged claims along Bayou Boeuf. His claim No. 34, for the land along Bayou Black and the upper end of Bayou du Large, was considered fraudulent as well (see Harper's letter of March 9, 1821). As with his other claims, however, Martin or his successors eventually were able to receive confirmation. Political clout may have played some part in these confirmations as Martin served as a State representative for Terrebonne Parish in1846, 1848, and 1852 through 1853 (Watkins 1939:51-52). Martin eventually transferred this tract to William C. C. Martin, who sold it to James Bowie on May 21, 1827 for four thousand dollars (Terrebonne Parish Conveyance Records D154 and D155).

Interestingly, the Houma tribal claim mentioned previously was one of the few other claims filed along this portion of Bayou Black. Although it was disallowed by the U.S. Land Commission, the absence

of other claims for this land lends some support to the argument that the Houma were residing there at that time.

In the eastern part of the study area, only two land grants, all along the upper reaches of Bayou du Large, were approved. These are extremely interesting, however, as they almost certainly represent a modified form of the Spanish sitio, measuring approximately one league on each side (Mires 1986:7). One of the sitios is located entirely within Townships 18S, Range 17E, comprises Sections 18 and 31, and was claimed in 1817 by Joseph Felice (Figure 5-5):

> No. 648. Joseph Felice claims a tract of land, situate in the county of Lafourche, on bayou Boeuf, having a front of one league on each side of said bayou, and a depth of forty arpents on each side of the bayou. The claimant, on the 29th of December, 1794, obtained from the Baron de Carondelet an order of survey for this land, but there is no evidence of location. Our opinion with respect to this claim is the same with that expressed in the proceeding, at No. 647 [Lowrie and Franklin 1834:267].

The location of the claim on Bayou Boeuf, rather than du Large, must simply be a "best guess," stemming from the fact that the order of survey did not specify the claim's exact location. The 1832 plat map of the township (Fritz 1832) shows Felice's claim (No. 648) properly on Bayou du Large.

The other sitio is noted in claim No. 647 and represents Sections 17 and 32 in Township 18S, Range 17E, and Section 11 in Township 17S, Range 17E. It was filed by Joseph Gabon in 1817 (see Figure 5-5):

> No. 647. Joseph Gabon claims a tract of land lying and being on bayou Boeuf, county of Lafourche, containing eighty arpents front on each side of said bayou, by forty arpents in depth on each side of the same. The claimant obtained fromthe Baron de Carondelet, on the 5th of November, 1794, a regular order of survey for the above quantity of land, but we have no evidence of its ever having been located, although we think it probable. If this claim has not been located, and the place designated in the order of survey be still vacant, we are of opinion that the claimant ought, in justice, to have the land claimed [Lowrie and Franklin 1834:267].

Again the description of the claim on Bayou Boeuf is questionable, but, as noted, the poor locational information in the order of survey probably explains the discrepancy. As with Felice's claim, the proper location on Bayou du Large is shown on the two relevant township plats (Fritz 1832; McCulloh 1855).

Other early claimants along bayous du Large and Grand Caillou prior to 1840 were:

Joseph Talbo	T18S, R17E Section 2, 11, 79
Joseph Felice	T18S, R17E Section 18, 31
Edmund Fongg	T18S, R17E Section 44, 3, 10, 12
George Toups	T18S, R17E Section 45, 4, 9, 14
Charles Jumoville Devilliers	T18S, R17E Section 6 and 7; T19S, R17E Section 1
Guillaume Terrebonne	T19S,R17E Section 2
Pedro Gonzales	T19S,R17E Section 19
Jacques Lambez	T19S,R17E Section 85
John Charles Terrio	T19S,R17E Section 86
Louis Cossier	T19SR17E Section 87; T20S,R17E Section 37

Joseph Talbo settled the land along Bayou Grand Caillou as early as 1794 when he received a grant from Governor Hector Carondelet of one league in length along the bayou with depths on each side of forty arpents (see Figure 5-5). This was essentially a league square. Talbo was growing sugarcane along both sides of the bayou by 1816 (McCulloh 1855), as eventually would most of his neighbors between Black and Four Points bayous (Terrebonne's 150th 1972). John Charles Terrio's tract, just south of the modern Falgout Canal, would become the heart of Dulac (Figure 5-6). The southernmost claim in the project area was that of Louis Cossier on Bayous Grand Caillou and du Large (see Figures 5-6 and 5-7).

The sugar boom at the end of the 1820s brought an influx of Americans into the region. The Lafourche Gazette reported in 1827 that "Upwards of fifty thousand dollars worth of wood lands on the Bayous Caillou, Black, etc., in the vicinity of the La Fourche, have been purchased during the past week by planters in the neighborhood of Natchez, for the purpose of being employed in the cultivation of sugar cane." (Tregle 1942:54). The population of Terrebonne Parish more than doubled from approximately 2,000 people in 1822 to 4,410 by 1840. The number of inhabitants had tripled to 12,091 by 1860, 56 percent of whom were slaves (Watkins 1939:53-54).

During the 1830s and 1840s sugar cane cultivation came to dominate the region. Terrebonne

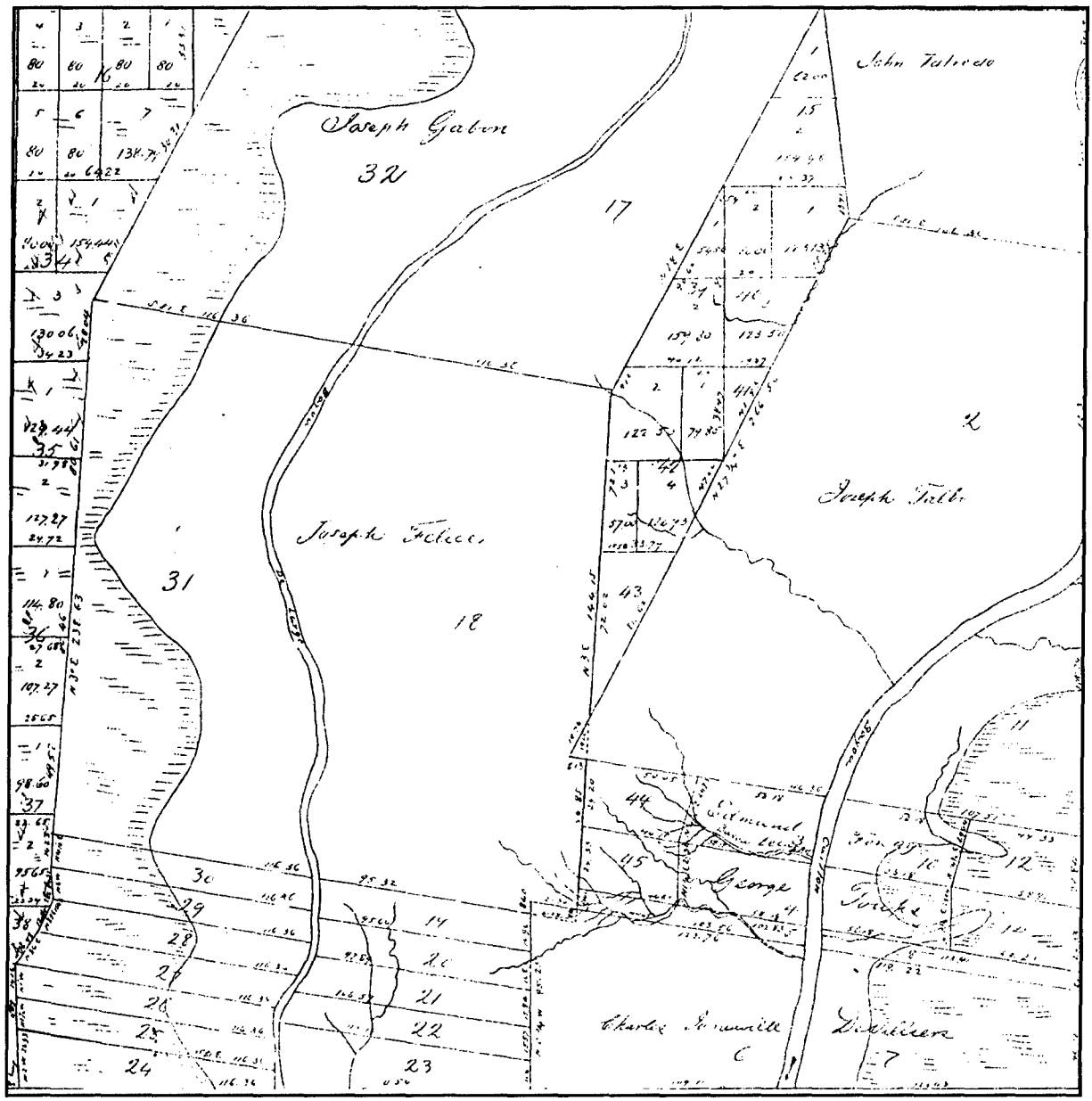


Figure 5-5. Plat map of Township 18 South Range 17 East showing the claims of Joseph Gabon, Joseph Felice, Joseph Talbo, and Charles Jumonville Devilliers (partial) on Bayous du Large and Grand Caillou (Righton 1831).

ranked seventh among the parishes in sugar production in 1844 and boasted 33 steam- and 10 horse-powered mills. Just a year later Terrebonne ranked sixth in the state and the number of mills in operation had almost doubled. The parish dropped to eighth place in 1849 even though the amount of sugar produced had actually increased, and the number of mills grown to 92 (Watkins 1939:89-90).

In the midst of such enormous economic growth, it is not surprising that by the 1840s almost all of the original land grants in the project region had changed ownership. An 1846 map by John La Tourette, showing many of the landowners in the state of Louisiana, includes only S. R. Rice as the owner of the principal Rice property on Bateman Island west of Bayou Shaffer (Figure 5-8). This may confirm Samuel Harper's earlier fears, brought out partly in a letter dated May 24, 1827, to George Graham, Commissioner of the General Land Office, that many of the initial land claimants, including Robert Martin, were simply attempting to acquire land for speculation:

Figure 5-6. Plat map of Township 19 South Range 17 East showing the claims of Charles Jumonville Devilliers (partial), Guilliame Terrebonne, Pedro Gonzales, Jaques Lambez, Charles Terrrio, and Louis Cossier (partial) on Bayou Grand Caillou (McCulloh 1856a).

> I have been lately informed that some of the persons concerned in those claims (with a view, no doubt, to induce people to buy them) have said that positive orders had been given by "the department" to the surveyor general to survey those lands, and that the surveys had been returned to my office. The first of these statements I do not believe, and the latter I know to be false. Not knowing what extraordinary measures may be taken to procure patents, I think proper to apprise you that I have not, nor will not, issue patent certificates for those lands without your express order, or unless I shall be compelled so to do by judicial authority [Dickens and Forney 1860:437].

With final confirmation of such claims, the land was quickly sold to new individuals.

Of particular interest are those lands along the north edge of Avoca Island, the east bank of La Coup, and Bayou du Large. On Avoca Island, Section 30,

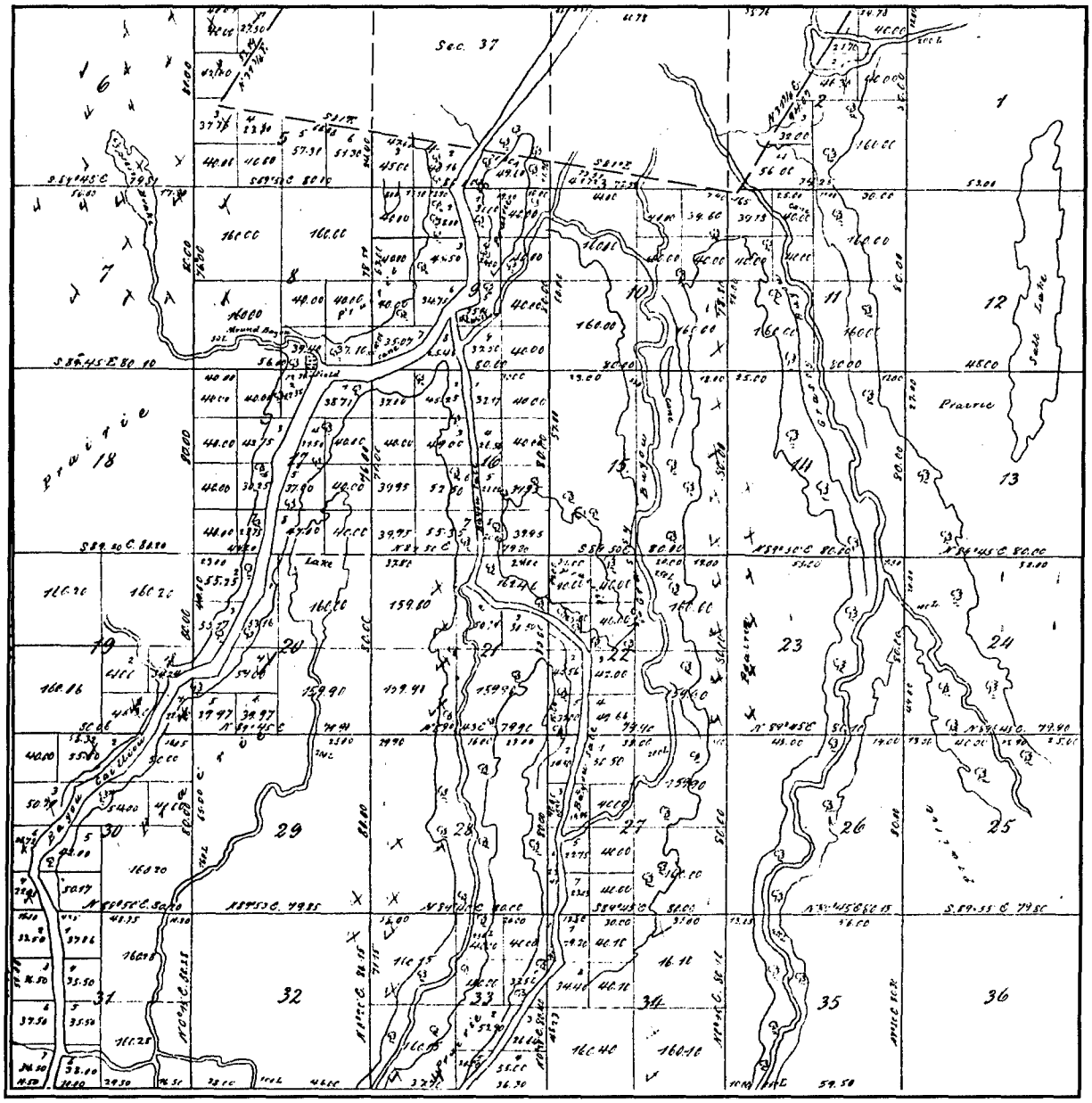


Figure 5-7. Plat map of Township 20 South Range 17 East showing the claim of Louis Cossier (partial) on Bayou Grand Caillou (McCulloh 1856b).

Township 16S, Range 12E, is owned by J. N. Wofford, while Sections 39, 40, and 41 in Township 16S, Range 13E are owned by William Rochelle. These were original land grants awarded to Samuel Russel Rice and Samuel Rice, Sr. William Washington Wofford acquired the land from the elder Rice in 1825. By 1843, it had passed into the hands of James Nixon Wofford who retained it until 1868. The Woffords established a small sugar plantation on the property and built a sugar mill along Bayou Shaffer about 0.25 mi south of the bayou's junction with Bayou Boeuf (Kelley 1988:39-44). The earliest sugar records available, dating to 1828 and 1829 (Degelos 1892), do not list either Wofford or Rochelle. There is a gap of 14 years, however, before the next set of sugar records, from 1844, are recorded. These list J. N. Wofford as having produced 142 hogsheads (Hhds) of sugar that year, and William Rochelle as having produced 122 Hhds (Champomier 1845).

On the east bank of La Coup, La Tourette (1846) recorded the landholdings of Pennison, Bourg, Daniel

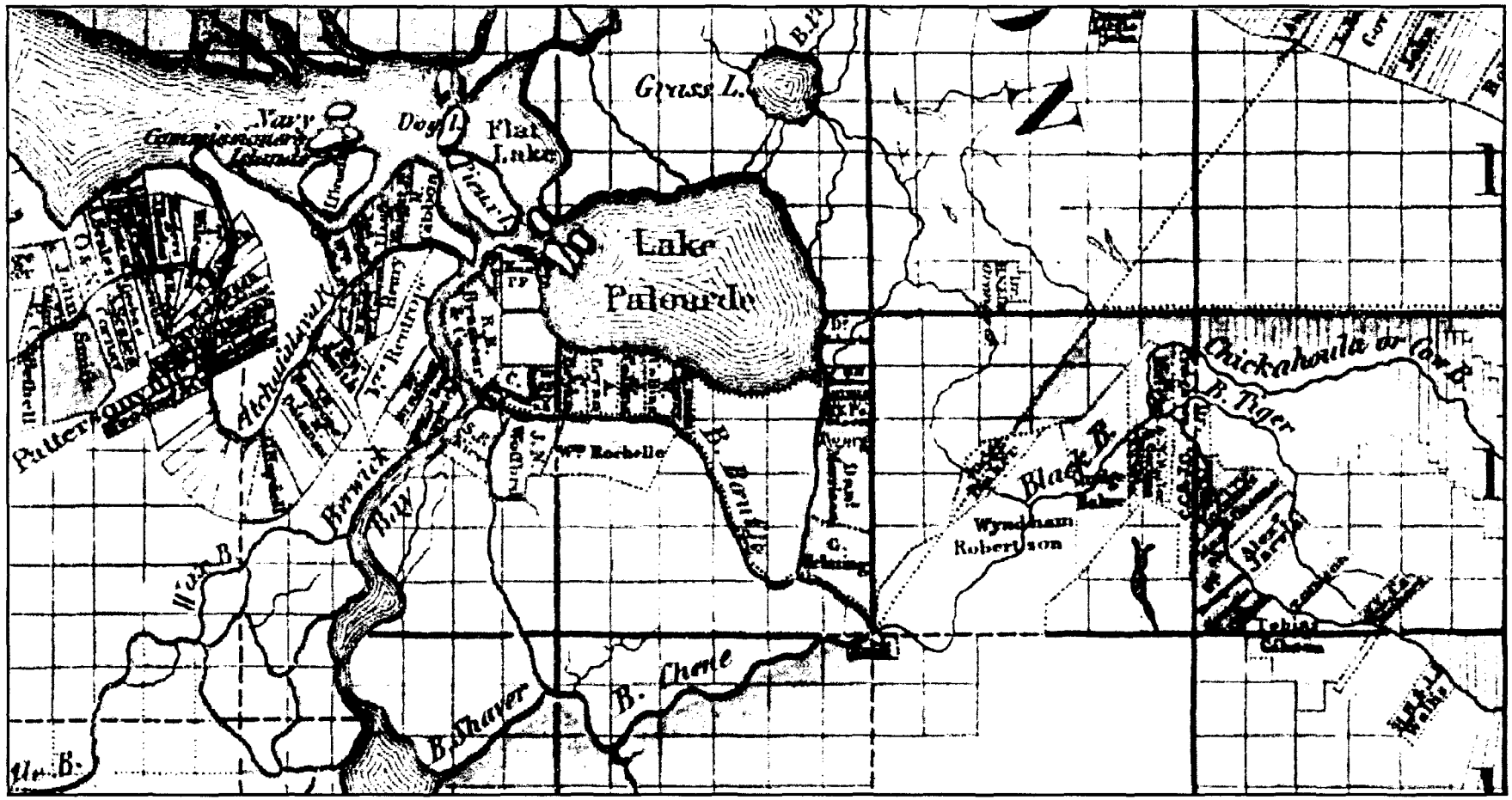


Figure 5-8. Detail of the La Tourette map of 1846, showing principal landowners west of Bayou Black (La Tourette 1846).

Morrison, and Schwing. Pennison probably refers to B. E. Pennison, apparently the son of Etienne "Peniçon" who had placed a land claim in 1812 which was subsequently rejected (see above). Apparently, following the township survey in 1842, all unclaimed, non-swamp land became available for purchase, and a parcel was acquired by Pennison. "Schwing" is undoubtedly George Schwing who, in 1832, had built the Hard Times Plantation house (16AS34) reported upon earlier.

Both B. E. Pennison and Morrison and Schwing had acquired their properties by 1844 when the sugar records indicate that Pennison produced a moderate amount of sugar, at 78 Hhds, while Morrison and Schwing accounted for 214 and 149 Hhds, respectively (Champomier 1845). Schwing's sugar production actually is referred to as that of "Schwing & Co." (Champomier 1845), so it is likely several partners were involved in operation of the plantation. It also is interesting to note that the 1844 sugar records record the production of "Gautreau & Aucoin" on Bayou Boeuf. It seems likely that these are the same Gregoire Aucoin and Benoit Goutreau (or their children) whose claim for land along Bayou Boeuf had earlier been rejected. Their names do not appear, however, on the La Tourette map.

At the junction of bayous Chene and Black, along the south bank of Chene, portions of Sections 1 and 6 of Township 17S, Ranges 13 and 14E, respectively, are shown as property of J. Earl. This name does not appear in any of the sugar records for 1844, '45, or '46 (Champomier 1845, 1846, 1849), so Earl may have been a hunter, trapper, or fisherman, a possibility substantiated by the relatively low land he has acquired.

La Tourette (1846) records the presence of a number of small landholdings and a few larger tracts along Bayou Black at the northern boundary of the study area (Figure 5-9). Most of these properties were located on the western portion of the bayou in Ranges 14 and 15 East. The large tracts, which belonged to Windham Robertson, Judge Joshua Baker, and Tobias Gibson, all supported productive sugar plantations by the late 1840s, and many of the smaller properties were producing sugar as well (Champomier 1846). Farther east along Bayou Black most of the land apparently remained undeveloped.

On the 1846 map by John La Tourette, John Martin's questionable claim to Sections 103 and 104 (T17S, R17E), near the junction of bayous du Large and Black, have been divided into the properties of Bond & Barrow, John Boykin, John McCrea, Bernard, and Dr. E.E. Kitteridge & G.F. Connolly (see Figures 5-4 and 5-9). The latter pair had also acquired the northern portion of Joseph Gabon's large sitio claim (Section 11, T17S, R17E), as well as the previously vacant Sections 47, 48, and 49 (T17S, R17E) (see Figures 5-4, 5-5, and 5-9). Barrow and Kitteridge and Connolly had acquired their tracts by 1844 and Boykins by 1847, according to the sugar records. No McCrea or Bernard appear in the records at all. The cane fields belonging to Bond & Barrow and Mr. Connolly are depicted on the 1855 plat map (T17S, R17E) (see Figure 5-4).

Robert Ruffin Barrow of J.B. Bond & Barrow was an Anglo-American planter who moved to Terrebonne Parish in the late 1820s from West Feliciana Parish where his family owned a number of large plantations (Floyd 1963:24). He quickly began acquiring land in Terrebonne Parish, some of it by rather unscrupulous means. Barrow filed several fraudulent claims for lands inhabited by Houma Indians (Bowman and Curry-Roper 1982:27), and purchased land from Robert Martin who had apparently acquired it illegally. Barrow's conflicts with the Houma reportedly led to his killing of several members of the tribe (Floyd 1963:24). He lived at Residence Plantation east of Houma on Bayou Terrebonne, but by the mid-1840s he owned or was a partner in five other plantations in Terrebonne Parish and one in Lafourche Parish, producing a total of over 1,500 Hhds of sugar per year (Champomier 1846). Barrow was by far the largest sugar producer in Terrebonne Parish, and by 1860 he had become one of the wealthiest planters in the state with property valued at over $1,062,000 (Floyd 1963:24).

Bond and Barrow's tract on Black Bayou was eventually called Crescent Plantation (see Figure 5-9). It produced 445 Hhds of sugar in 1844, and 400 in both 1845-6 and 1849-50. By 1850-51 he used a steam-powered mill to yield 440 Hhds. Between 1852 and 1856 this tract produced between 420 to 720 Hhds of sugar a season. 1856-57 and 1857-58 were both bad years with just 140 Hhds of sugar, and 270 (90 burnt), respectively. Too much rain and killing frosts were to blame in 1856-57 (Watkins 1939:91) and fire in 1857-58. However by the 1858-59 season, production was back up to 400 Hhds, with an increase to 507 Hhds in 1861-62 (Champomier 1845-1846, 1850-1859; L. Bouchereau 1869).

John Boykin's plantation on the old Martin claim, Nameoka, raised 168 Hhds of sugar in 1849-50 (see

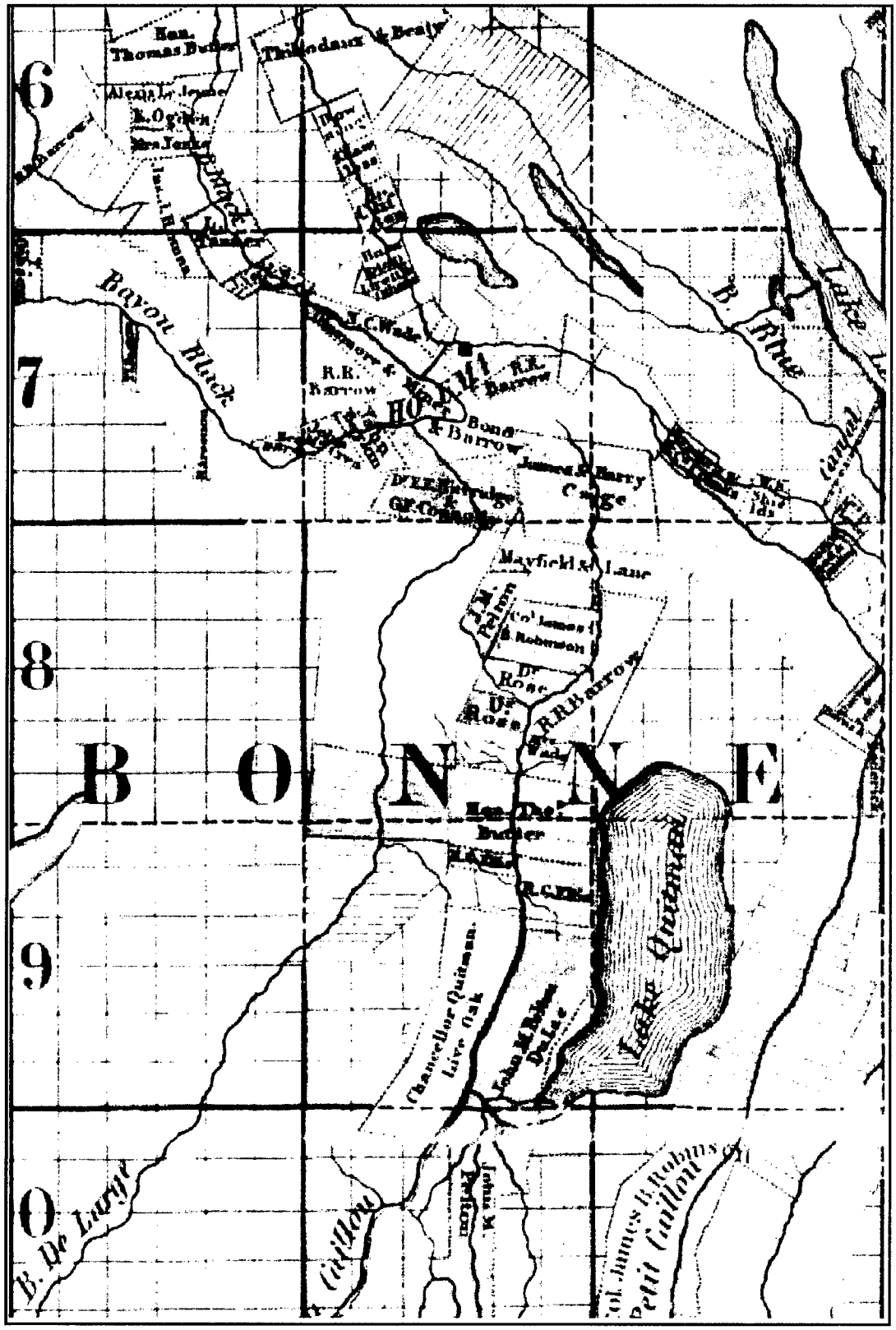


Figure 5-9. Detail of the La Tourette map of 1846, showing principal landowners on Bayous du Large and Grand Caillou and the eastern end of Bayou Black (La Tourette 1846).

Figures 5-4 and 5-9). The following season he and a partner, Lang, used a steam-powered mill to turn out 250 Hhds. Boyd & Lang went on to produce 270 Hhds in both 1851-52 and 1852-53. Production then ranged from 215 to 425 Hhds between 1854 and 1862, excluding the bad season of 1856-57 when just 57 Hhds were raised. The Boykin in the partnership changed to E.M. Boykin in 1851 (Champomier 1850-1859; L. Bouchereau 1869).

E.E. Kitteridge, along with Robert Martin, represented his parish in state government in 1853. He served again the next year with J.B. Key (Watkins 1939-51-52). Kitteridge and J.R. Connolly raised 268 Hhds of sugar in 1844, 429 in 1845-46, and 240 in 1849-50 when they called their property Bayou Large (see Figure 5-4 and 5-9). This partnership then disappears from the sugar records (Champomier 1845-1846, 1850).

The lower portion of Gabon's original claim (Section 11, T17S, R17E) is shown as unoccupied in 1853, as are Sections 18 and 31 (T18S, R17E), Joseph Felice's former property (see Figures 5-5 and 5-9). Mayfield & Lane, Col. James, E. Robinson, Dr. Rose, and R.R. Barrow were the new owners of Joseph Talbo's Section 2 (T18S, R17E). J. M. Pelton had acquired most of Section 39, all of 40 and 41, and part of 42 (T18S, R17E), all previously unclaimed (see Figures 5-5 and 5-9). Mr. Pelton's property is labeled as "Turner & Pelton's Plantation" on G.W. Hughes' 1842 "Map of a Military Reconnaissance and Survey of the approaches to New Orleans from the Gulf of Mexico" (Figure 5-10).

Mayfield & J.A. Lane were producing sugar on their tract, called Ashland Plantation, by the 1849-50 season, which yielded 190 Hhds. The next year's yield using a steam-powered mill was 165 Hhds. The average crop between 1851 and 1858 was 258 Hhds, excluding the bad season 1856-57 when just 50 Hhds of sugar were produced. Mayfield was the sole owner of the plantation by 1856. Duncan S. Cage had acquired Ashland by the 1858-59 season and raised 417 Hhds of sugar. His yield had increased to 515 Hhds in 1861-62 (Champomier 1850-1859; L. Bouchereau 1869).

Col. James E. Robinson does not appear in the sugar records until 1858-59 with a yield of 250 Hhds on his Cedar Grove Plantation. His name on the 1846 La Tourette map suggests that he may have owned the property for several years prior to growing any sugar (see Figure 5-9). In 1861-62 340 Hhds

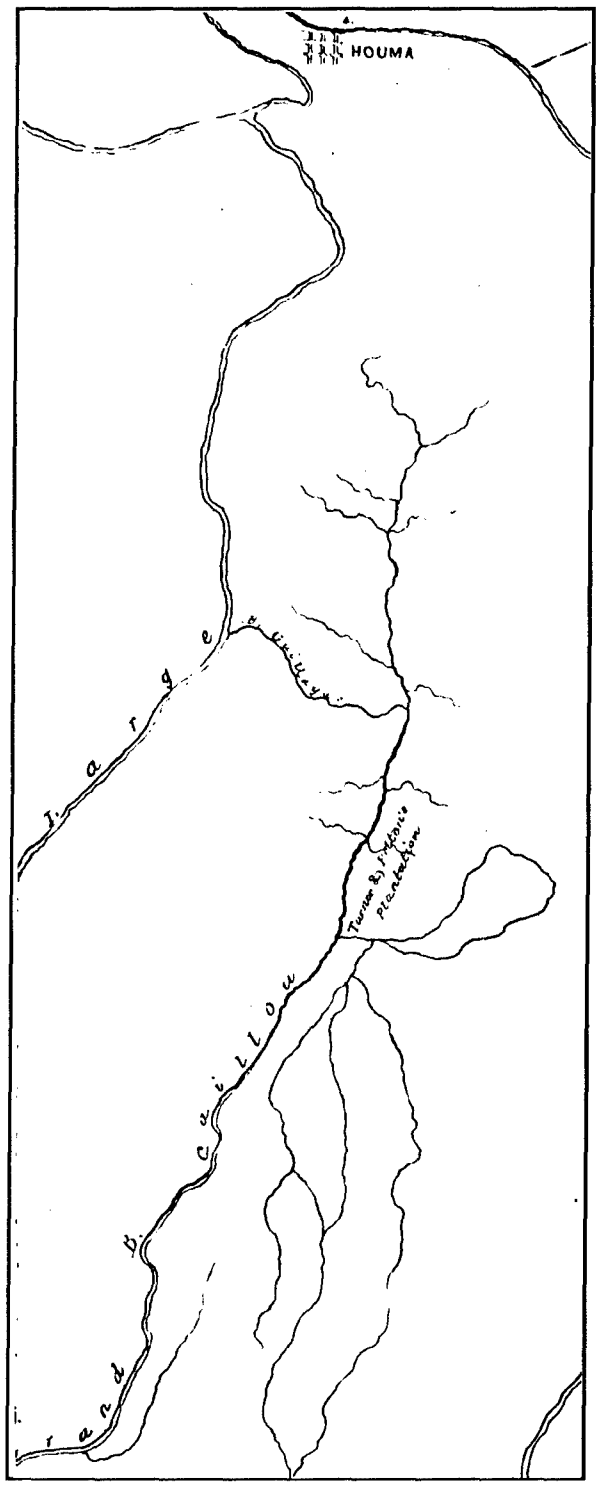


Figure 5-10. Detail of the Hughes map of 1842, showing "Turner & Pelton's Plantation" on Bayou Grand Caillou (Hughes 1842).

of sugar were raised on Cedar Grove (Champomier 1859; L. Bouchereau 1869). No Dr. Rose appears in the sugar records at all.

R.R. Barrow, discussed above, had acquired his part of the Talbo claim by 1844, perhaps from the William R. Butler listed in the sugar records for this location in 1831 (see Figures 5-5 and 5-9). William's output for that year was 53 Hhds of sugar. Thirteen years later, R.R. Barrow, in partnership with one Baker, produced 193 Hhds of sugar that season. Known as Caillou Grove, this property grew 134 Hhds of sugar in 1845-6, and belonged solely to R.R. Barrow. For the 1849-50 season production was 230 Hhds in a mill powered by steam. Production dropped from 202 in 1850-51 to 90 Hhds for the next two seasons. Yet Caillou Grove rebounded to raise 230 to 560 Hhds annually between 1854 and 1861, excluding a bad year in 1856-57 when output was just 83 Hhds of sugar (Champomier 1831, 1845-1846, 1849-1859; L. Bouchereau 1869).

John M. Pelton either did not raise sugar on his previously unclaimed sections (Section 39, all of 40 and 41, and part of 42, T18S, R17E) adjacent to the Talbo claim (see Figures 5-5 and 5-9), or his production was lumped in with that of his much larger plantation to the south discussed below.

According to the La Tourette map, Section 10 (T18S, R17E) of Edmund Fongg's claim had passed to a Mrs. Wade by 1853 (see Figures 5-5 and 5-9). Yet her name does not appear in the sugar records. She might have been a relative of N.C. Wade who owned property outside the project area by 1846 (Champomier 1849). Fongg's remaining Sections 44, 3, and 12 (T18S, R17E) are shown as unoccupied (see Figures 5-5 and 5-9). George Toups' sections to the south, 45, 4, and 9 (T18S, R17E), also appear vacant. At some time between 1830 and 1846 part of Charles Jumonville Devilliere's Section 1 (T19S, R17E) had been transferred to the widow and heirs of Albert Beausergent (McCulloh 1856). By 1846 the property belonged to Thomas Butler (see Figures 5-6 and 5-9). R. G. Ellis had obtained at least part of Section 2 (T19S, R17E) from the heirs of Guilliame Terrebonne and some part of Section 19 (T19S, R17E) from Pedro Gonzales by 1853 (see Figures 5-6 and 5-9).

Thomas Butler had acquired the Devilliere tract by 1844 probably from his relative "Judge Butler" who appears as the owner in the sugar records of 1831 with an output of 37 Hhds. Thomas increased the yield by 1844 to 408. Brothers Thomas and Richard Butler worked the property the next year and raised 330 Hhds. By the 1849-50 season, Thomas Butler had died and his estate produced 436 Hhds of sugar. This property had a steam-powered mill by 1850-51 that yielded 308 Hhds. In the good seasons between 1852 and 1859 the crop ranged from 176 to 550 Hhds annually. However, in 1856-57 just 81 Hhds were produced (Champomier 1831, 1845-1846, 1849-1859; L. Bouchereau 1869).

Richard G. Ellis reportedly owned 1893 arpents of land primarily on the left bank of Bayou Grand Caillou that he had acquired from John Hutchins (Watkins 1939:69). While his name is shown on the 1846 La Tourette map on the old Terrebonne and Gonzalez claims, R.G. Ellis does not appear on Grand Caillou in the sugar records until 1855 when he had no crop. Nor was sugar raised on his land, known as Ellislie, the next season. He managed to eke out 13 Hhds in 1857-58, built up to 78 Hhds by 1858-59, and peaked at 128 Hhds in 1861 (Champomier 1856-1859; L. Bouchereau 1869).

A new joint ownership, Blanchard & Ranson, appears in the sugar records in 1851 that also must have been located on parts of the Terrebonne and Gonzales land grants, perhaps those portions shown as vacant on the 1846 La Tourette map (see Figures 5-6 and 5-9). They used a horse-powered mill to produce 55 Hhds of sugar in 1851-52 and 1852-53 and called their property Blanchard Plantation. Output tripled to 150 Hhds in the 1853-54 season, probably due to a conversion to steam power. Yields ranged from 150 to 315 Hhds between 1855 and 1862, again excepting the 1856-57 season when just 70 Hhds were made (Champomier 1852-1859; L. Bouchereau 1869).

The former grants of Jacques Lambez (Section 85, T19S,R17E), John Charles Terrio (Section 86, T19S,R17E), and Louis Cossier (Section 87, T19SR17E; Section 37, T20S,R17E) had been transformed into two large sugar plantations by the time La Tourette made his map (see Figures 5-6, 5-7, and 5-9). The west bank lands belonged to Chancellor Quitman and were known as Live Oak Plantation, while the larger Dulac (sometimes Bayou Dulac) Plantation on the east bank belonged to John M. Pelton, mentioned previously in reference to the Felice and Talbo claims. Dulac Plantation also included all or parts of Sections 10, 11, 22, 15, 16, 21, and 22 (T19S, R17E)—lands previously unclaimed (see Figures 5-6, 5-7, and 5-9). All tracts south of Sec-

tion 22 in the project right-of-way are shown as vacant on the La Tourette map (see Figures 5-7 and 5-9).

Chancellor Quitman, called Capt. Quitman in the sugar records, owned his plantation by at least 1844 when he raised 295 Hhds of sugar. Production at Live Oak ranged from 205 to 434 between 1845 and 1859, excluding the bad season of 1856-57 when just 93 Hhds were raised. Governor John A. Quitman is listed as the property owner by the 1850-51 season and is operating a steam-powered mill by this time. He entered a partnership with his son F. Henry Quitman in 1855 that persisted to at least 1859 (Champomier 1845-1846, 1849-59).

John Anthony Quitman was a native of New York State, but moved to Natchez, Mississippi where he studied and practiced law. He served as governor of Mississippi from 1835 to 1836 and 1850 to 1851. He also served in the Mississippi State house and senate, as a state court judge, and as a U.S. representative. While holding the latter office, Quitman was apparently deliberately poisoned during the inauguration banquet of President James Buchanan in Washington. D.C. He subsequently died on July 17, 1858 in Adams County, Mississippi near Natchez (Kestenbaum 2003).

John Quitman bought property in Terrebonne Parish in 1829, 1833, 1834, 1837, and 1838, although he never appears to have resided there. In 1838 he purchased the eastern half of the Lambez grant from James Bowie who had acquired it from Jacques Lambez. In 1855 John passed one-third of Live Oak plantation to his son F. Henry Quitman who lived there in a colonial residence known as Quitman Place (Figure 5-11). Upon John's death in Adams County Mississippi on July 17, 1858 his remaining undivided two-thirds of the plantation were described as 114 arpents front on the right bank of Bayou Grand Caillou valued at $77,525 (Watkins 1939:70-72).

Dulac Plantation, opposite Live Oak on Bayou Grand Caillou, belonged to John M. Pelton by at least 1844 when he raised 750 Hhds of sugar. Large yields of between 410 and 825 Hhds were the norm on Dulac from 1845 to 1861, again excepting 1853-54 when just 317 Hhds were produced (Champomier 1845-1846, 1849-59; L. Bouchereau 1869).

On the Banks map of 1863 (Figure 5-12), the names of some of the original claimants persist. However, some obviously contemporary owners and their homes are shown as well. Mr. Connolly and Bond & Barrow's cane fields appear in Section 103, although former claimant "Rob Martin" is listed there as well. A structure appears on the Bond & Barrow tract. Sugarcane fields are clearly shown along bayous Grand Caillou, du Large, Grassy (Four Points), and Petit Terrebonne (Black), as well as several short man-made canals.

By 1861, previously unclaimed Section 9 (T19S, R17E) between Dulac Plantation and Bayou Grand Caillou had apparently been settled by a Wilton whose home stood near the confluence of bayous Grand Caillou and Sale. As no Wilton appears in the sugar records, he may have been a small farmer that raised other crops. The only Wilton documented in Lafourche or Terrebonne parishes at this time is William Wilton from Long Island, New York. He married Terrebonne native Marcelline Guitreax on 26 May 1836 and had at least two children: Louise, born 13 October 1837, and Mary, born 30 November 1838. Both these births were recorded in the Catholic Church in Lockport (Hebert 1978:541). A son, William L. Wilton may have been born after 1840 (Chauvin n.d.:215). The Wilton home does not appear on the USGS quadrangle map of 1892 and may have been removed or abandoned by this time (USGS 1892a). The archaeological remains of this house, if they survive, would be located in the vicinity of prehistoric site16TR151, at the intersection of bayous Plat and Grand Caillou, immediately east of the HNC.

From the 1840s until the outbreak of the Civil War in 1861, the lands within the study area continued to develop into sugar-producing plantations and small farmsteads. Over 100 large sugar plantations with 80 sugarhouses were in production in Terrebonne Parish by 1851. The greatest impact on the region was to come in the form of the New Orleans, Opelousas, and Great Western Railroad, designed to link New Orleans with western Louisiana. By the early 1850s, the railroad had acquired rights of way for much of its proposed route across Tiger Island (Goodwin et al. 1985a:53). Land on the western end of the island had been acquired during the 1830s and 1840s by Dr. Walter Brashear (Goodwin et al. 1985a:43). Brashear donated his lands to his children, Robert B., Thomas T., and Francis E. Brashear in 1842 (Goodwin et al. 1985a:46), and in 1853, they had a plan drawn up to divide their holdings into lots within the "Town of Brashear" (Goodwin et al. 1985a:58, Fig. 7). In March 1860 the inhabitants of the town petitioned the Louisiana legis-

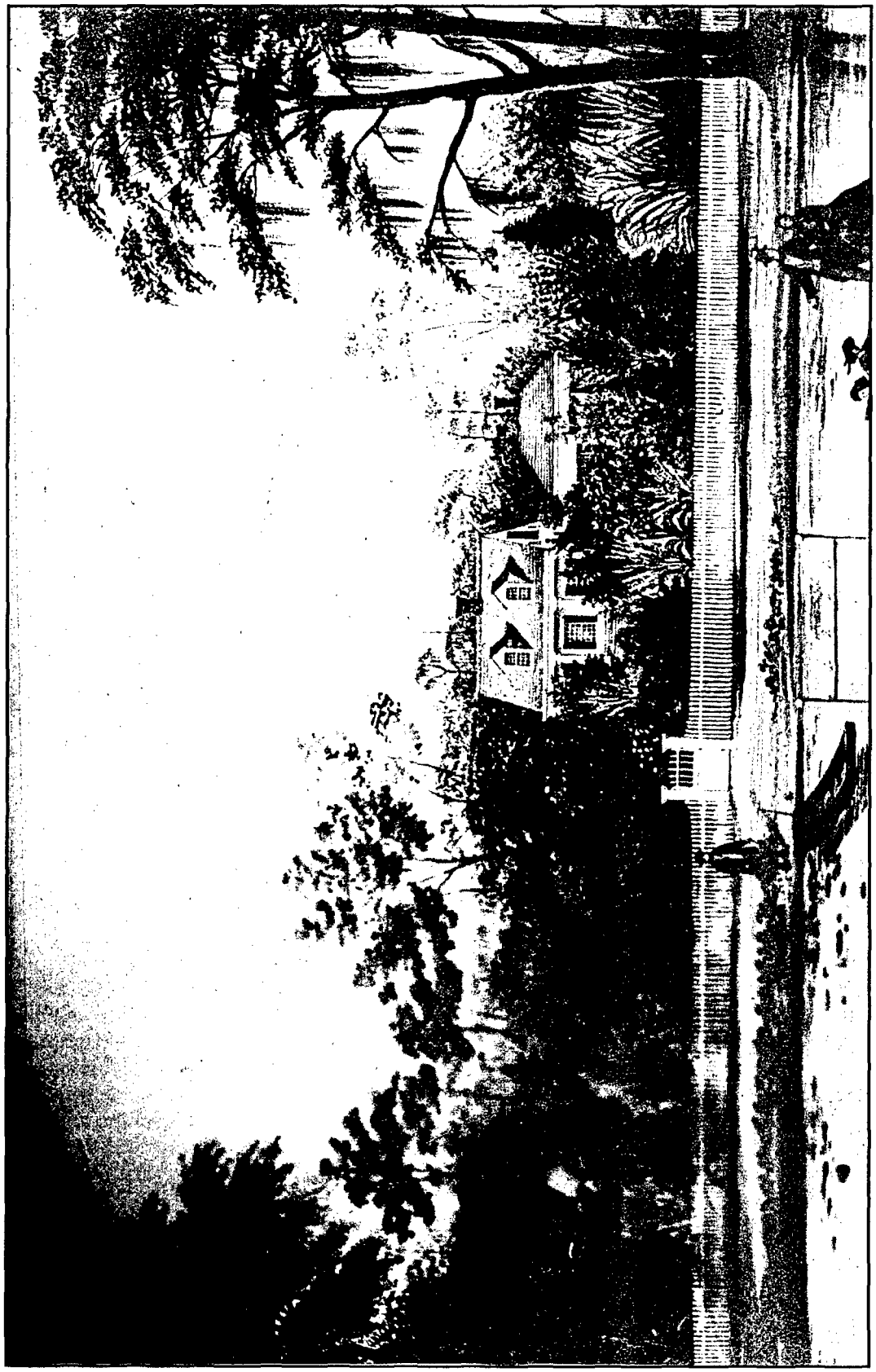


Figure 5-11. Quitman Place on Live Oak Plantation (Watkins 1939).

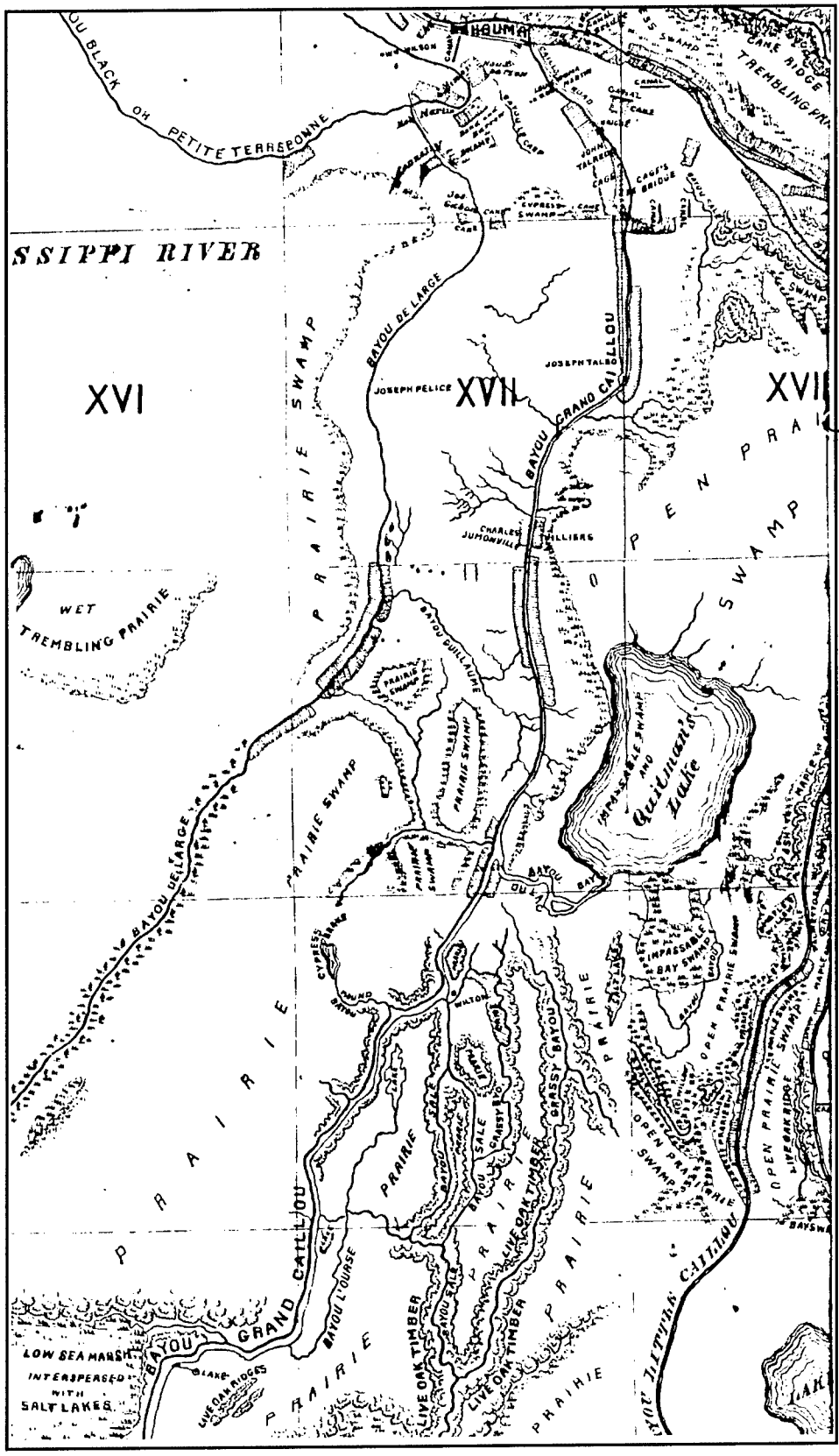


Figure 5-12. Banks map of 1863, showing landowners, structures, cane fields, and canals in the project area (Banks 1863).

lature for incorporation status. This was granted, and Brashear City became a reality (Goodwin et al. 1985a:60).

In the eastern part of the study area, the town of Houma began to grow as more and more settlers moved into the area. Originally established around what is believed to have been one of the Houma Indians' principal villages, the actual town developed on land claimed by Joseph Hache in Section 7, Township 17S, Range 17E (see Figure 5-4). In 1832, Houma became Terrebonne's parish seat (Work Projects Administration [WPA] 1941:390), although the first actual buildings in town were not erected until 1834. Prior to this date, Williamsburg (now Bayou Cane) about four mi west of Houma had served as the parish seat.

By 1841, Houma still consisted of just "three or four little houses" (Becnel 1989:12-13) that were confined to the south bank of Bayou Terrebonne. While incorporated as a city in 1848, Houma's corporate limits were not expanded to include the north bank of the bayou until 1899 (Castille 1983:2). The 1855 plat map of the township shows only 11 city blocks within Hache's claim fronting on Bayou Terrebonne (McCulloh 1855) (see Figure 5-4). However, a note on the map states that the entire township originally was surveyed in 1830 and '31, so the tiny town shown may actually date to the 1830s. G. N. Pierce (reprinted in Walkins 1939:106-107) described the town in 1851 as a:

> ...considerable village,...consist[ing] of five stores, ten or twelve dwelling-houses, a church (Methodist), a blacksmith shop, a schoolhouse, a hotel, a grog-shop and billiard room, together with the paraphernalia of justice—such as the courthouse, Clerk's, Sheriff's and Recorder's offices, (all in one building) and a jail. Offices here, though elective, are hereditary, and descend from father to son, or in default, to collateral relations; and here appears to be antagonism between the American and Creole part of the population.
>
> There are also in this place sundry lawyers' and doctors' offices.

In 1861, Louisiana seceded from the Union and joined the Confederate States of America. Early in the war, New Orleans and Baton Rouge were occupied by Union troops and became staging areas for expeditions into more remote portions of the state. In 1863, both Confederate and Union forces vied for the strategic location of Berwick Bay and Brashear City.

Goodwin et al. (1985a:60-64) provide a good review of the Brashear City area during the war. Principally, the location was highlighted by the initial construction of two Confederate forts: Berwick and Chene. Fort Berwick consisted of:

> An earthen fort, quadrilateral in shape with parapets five feet high on three sides, the rear being protected by palisades about seven feet high, loopholed for musketry, the whole was surrounded by a moat six feet wide in front and three feet in rear. On the front face two 24-pdr pivot guns were mounted which commanded the outlet of Wax Bayou [Casey 1983:24].

The fort was built in July, 1861, and was designed to prevent access, through Wax Bayou, to the marshes to the west and the southern edge of the Teche ridge. The fort was located in the northeast corner of Section 16, Township 16S, Range 12E, along what is today the north bank of Little Wax Bayou at its junction with the Lower Atchafalaya River (see Figure 3-3). Casey (1983:24-25) reports that the fort was abandoned in April, 1862, after the fall of New Orleans.

Fort Chene was another small earthwork located at the junction of bayous Chene and Shaffer, along the southeast edge of Avoca Island (Gibson 1978b:171; Casey 1983:44; see Figure 3-3). It was built in August, 1861, and contained a small, central barracks area protected by an outer ditch around the earthworks (Casey 1983:44). The entrance to Bayou Chene apparently was closed off by a stockade. Armament consisted, at various times, of two 24-pd pivot guns, one rifled 32 pounder, and four 24 pounders (Casey 1983:44). As with Fort Berwick, Fort Chene was abandoned in April, 1862, after the guns were spiked (Casey 1983:44).

Union forces moved into the region in October, 1862, under the command of Brigadier General Godfrey Weitzel. Included in the force were four gunboats, *Estella*, *Calhoun*, *Kinsman*, and *Diana* (Goodwin et al. 1985a:62). With the gunboats patrolling the Atchafalaya River and Bayou Teche, the Union troops occupied Brashear City and built additional fortifications. Figure 5-13 shows a map of Union earthworks and minor forts as drawn in 1865 by Captain P. Harris of the U.S. Corps of Topographical Engineers. Included in these were Fort Brashear

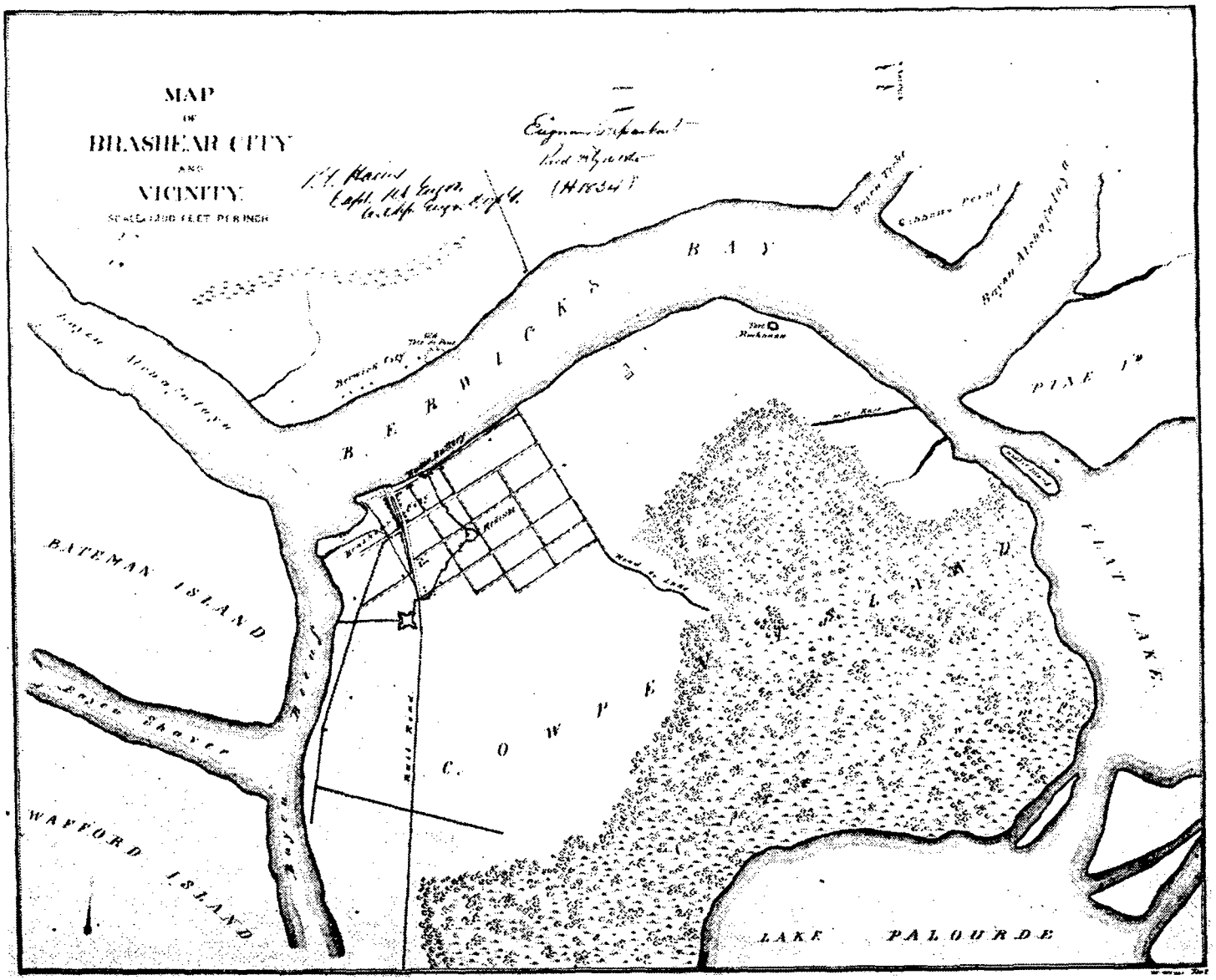


Figure 5-13. Portion of the Union map of Brashear City and Vicinity during the Civil War, showing military installations and associated earthworks (Harris 1865, reproduced in Casey 1983:Pl. 47).

(later to become Fort Star), shown at the eastern edge of the city, Fort Buchanan, opposite the mouth of Bayou Teche; a water battery on Berwick Bay, and a redoubt located north of the railroad near the center of town (Casey 1983:32-33). Embankments, including two redans, were built to connect the principal earthworks within the city (Casey 1983:33).

Another minor fort was apparently constructed at Boeuf Station, on the east bank of La Coup just south of the crossing of the railroad. Called Fort Weitzel on several maps of the era, little is known of the post (Casey 1983:243). It may simply have been a small earthwork garrisoned by a few troops. In the project area another small fort apparently existed at the intersection of Mound Bayou and Bayou Grand Caillou, the site of Indian mound site 16TR22. "Old Fort (Butler)" appears on the site on a 1931 U.S. Engineer Office map of canals on Bayous Grand and Petit Caillou, Pelton, and La Carpe (Odom 1931) (Figure 5-14). However, no historic component was noted at this site when visited by McIntire in 1951 or Saunders in 1994. Three battles are known to have occurred along Bayou Grand Caillou; the first on 8 May 1862, the second on 19-27 November 1864, and the last on 19-25 April 1865 (Booth 1921: 514; Odom 1943:1022).

In June of 1863 the Confederates launched a waterborne assault on the north bank of Tiger Island and captured Brashear City by approaching from the east (Goodwin et al. 1985a:64). At the same time, Confederate forces marched westward from Thibodaux along the railroad line and captured the fort at Boeuf Station (Bergeron 1985:203).

Confederate control of the region was short lived, however. On July 9, 1863, the Confederate forces at Port Hudson surrendered, freeing the large Union siege force for action in south Louisiana. Fearful that Confederate forces would be trapped east of the Atchafalaya River, Major General Richard Taylor, commander of Confederate troops in south Louisiana, ordered all his forces west of Berwick Bay to Bayou Teche. This retreat left the region open to Union forces, which moved in shortly thereafter (Bergeron 1985:204).

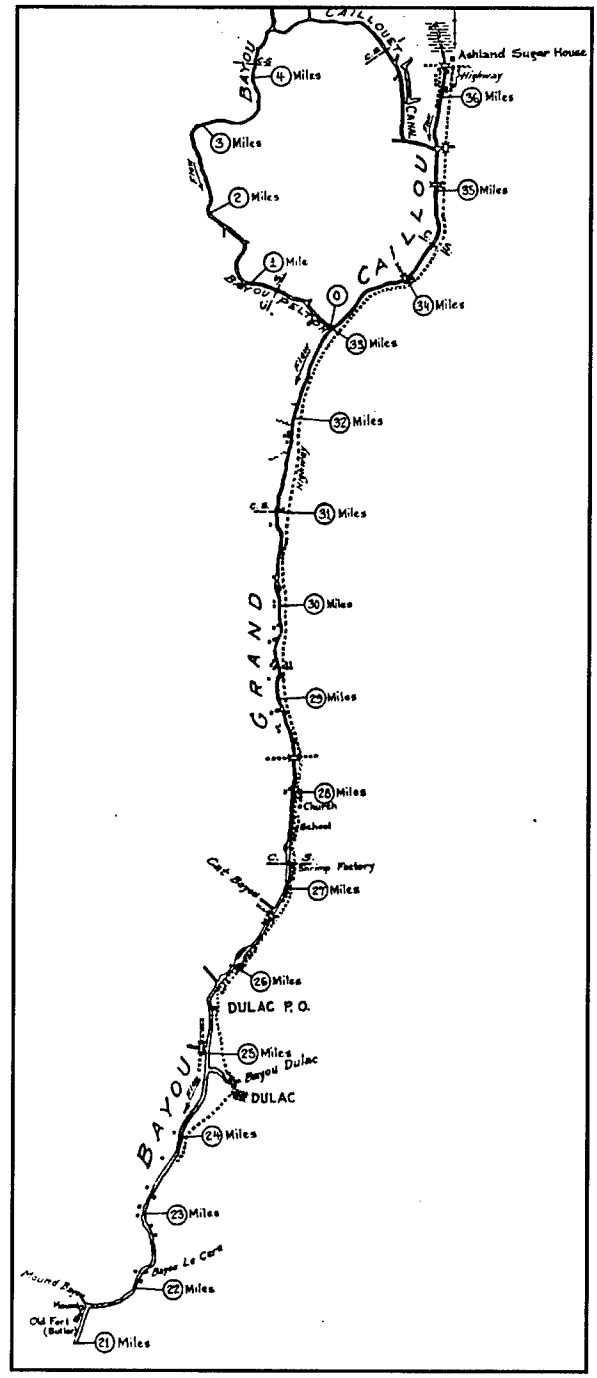


Figure 5-14. Civil War Fort shown on 1931 U.S. Engineer Office map of canals on Bayous Grand and Petit Caillou, Pelton, and La Carpe (Odom 1931).

Of interest from this time period, is the Confederate map of St. Mary Parish, completed in 1864, after the Confederate withdrawal across Berwick Bay (see Figure 3-3). It not only shows fortification occupied by both sides, but includes the locations of plantation buildings (main houses, sugar mills, quarters areas) along the north bank of Avoca Island. Sections 40, 41, 43, and 47 each contain one plantation complex, while Section 45 appears to contain two complexes. These almost certainly represent the holdings of Wofford, Rochelle, and Edwin

Stansbury, the latter a large landowner on Tiger Island who also acquired land on Avoca Island (Goodwin et al. 1985a:49). No captured Confederate maps exist for Terrebonne Parish.

Following the Civil War, a period of economic stagnation developed that lasted throughout much of the Reconstruction era. In the project area, only John M. Pelton of Dulac Plantation and C.S. Cage of Ashland were able to retain their properties through the war. Pelton also seems to have acquired adjacent Live Oak Plantation from the Quitmans. Yet both Pelton's large plantations only produced about one-sixth of his pre-war sugar yields in the 1868-69 season. That same year, Cage's sugar production dropped by almost 50 percent to 280 Hhds, and he had also raised 20 Bhls of rice. All but one of the plantations in the project area were using steam power and open kettles at this time. All the sugar houses but Pelton's were made of wood, while his was brick and had a shingled roof (L. Bouchereau 1869).

Bond and Barrow's Crescent Plantation on Black Bayou belonged to Dr. A. Helmick in 1868 and produced 255 Hhds of sugar. Boykin's Nameoka had passed to J.C. Jackson, had no sugar apparatus at all, and grew 10 Bhls of rice. LMT McClung & Company owned Robinson's Cedar Grove by this time where 39 Hhds of sugar and 15 Bhls of rice were grown. Both Caillou Grove and Ellislie plantations had been acquired by Ewing Chapman by 1868. That year he grew 54 Hhds of sugar on Ellislie and 77 Hhds of sugar plus 15 Bhls of rice on Caillou Grove. Finally the Blanchard and Rancon farm belonged to J. Lapene & Company and produced 169 Hhds of sugar (L. Bouchereau 1869).

Over the next two years R.G. Ellis briefly regained Ellislie, Likewise, R.R. Barrow was able to buy back Caillou Grove and E. M. Boykin his Nameoka, both in partnership with J. Lapene. Pelton sold Live Oak and Dulac plantations in 1872 to G.D. Cragin. The Barrows returned to Crescent Plantation on Black Bayou in 1875 in conjunction with Peter Berger. Meanwhile Ellislie and Live Oak had been absorbed by J. Lapene. By 1876, the only pre-war owners in the project area were Duncan S. Cage at Ashland and Boykin at Nameoka. Boykin finally sold out in 1880 while the Cage family held out until 1887. The project area properties then moved through several hands as tracts were subdivided and some renamed (A. Bouchereau 1880, 1887; L. Bouchereau 1869-1876).

Reconstruction in Terrebonne Parish was followed by a period of economic growth and renewal in the last few decades of the nineteenth century. This upswing was due to innovations in agricultural practices, such as artificial rice irrigation, to the application of new scientific techniques to cane and cotton farming, to the discovery of oil and sulphur in the southwestern parishes of the state, and to the growth of the lumber industry, which was spurred by the completion of several railroad systems.

The clusters of buildings considered typical of sugar plantations appear along Bayous Black and Grand Caillou on the 1892 USGS quadrangle maps (USGS 1892a, 1892b). In 1891 the great Terrebonne Sugar Mill opened at Montegut (Wurzlow 1985:VII:58), and by 1900 three sugar mills were in operation along Bayou Grand Caillou. The one on Dulac Plantation, then owned by the Widow F. Lottinger, was destroyed by a hurricane in 1909. Likewise, the hurricane of 1926 demolished the mill at Live Oak Plantation (Figure 5-15). The Ashland sugar mill shut down in 1930.

Two saw mills also operated briefly along the bayou, one on Dulac Plantation at Goatfield, the old name for the point of land the Coast Guard Station now occupies, and the other on Live Oak Plantation. The former mill had a capacity of 15,000 board feet per day, while the latter mill had closed by 1897 (Terrebonne Parish Directory 1897). Logs were dragged by pullboats to the nearest canals and then floated to the sawmill. Pullboat scars radiating out from Forty Acre Bayou (a logging canal) are still visible on a 1956 aerial photograph in the southwest portion of the Talbo grant, then known as Cedar Grove Plantation. Similar scars appear along the western edge of the old Lambez claim on Live Oak Plantation (Amman International Corporation 1956:245A). Grand Caillou timber was floated westward to Morgan City.

Cedar Grove Plantation on part of the old Talbo grant (Section 2, T18S, R17E) belonged to Blum & Cantrelle in 1891. Manager and overseer T. A. Prevost and his assistance Albert Cantrelle had 250 acres in cane and 130 in corn that year. Ashland, also on part of the Talbo grant, belonged to Caillouet & Maginnis. W. R. Darden served as overseer, assisted by E. J. Richard. Coopers Oscar and Fred Robichaux were also employed there (Terrebonne Parish Directory 1897).

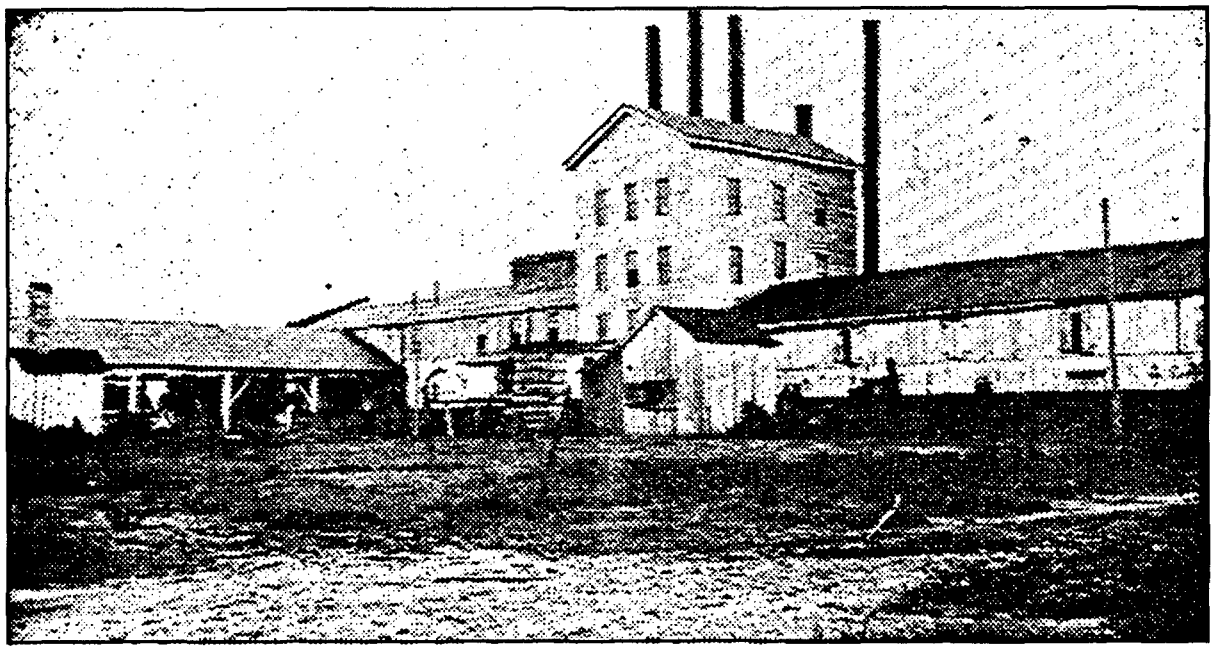


Figure 5-15. Sugar Mill on Live Oak Plantation circa 1900 (Wurzlow 1985:59, vol. 7).

On the old Fongg, Toups and Devilliere grants (Sections 44, 3, 10, and 12; 45, 4, 9, and 14; 6 and 7 in T18S, R17E. Section 1 in T19S, R17E) in 1891 were J. B. Leblanc's small plantation with 25 acres in cane; Cane Brake Plantation owned by Louis Waguespack; the home of Luke Lecompte, a carpenter; Grand Caillou Plantation; and the farm of Luke Boudreaux. The Cambon Brothers operated Grand Caillou Plantation and store, while Luke Boudreaux also ran a store with his clerk W. T. Raby. Boudreaux had 200 acres in cane and a 100 in corn in 1891. Joseph W. Martin owned Live Oak plantation by this time, and employed Anatole Boudreaux as engineer and blacksmith. Manager E. J. Engman had 170 acres in cane and 60 in corn that year. In 1896 the Live Oak sugar mill, on the banks of Bayou Grand Caillou, produced 245,000 pounds of sugar. Dulac plantation and store belonged to Mrs. Frederic Lottinger by 1891 and covered three thousand acres, 550 in cane and corn. Her clerk was Ellis Lottinger and her carpenter J. Domangue.

An excellent review of the Reconstruction era in the Morgan City area is provided by Goodwin et al. (1985a:64-82). Suffice it here to say that in 1869 Charles Morgan purchased the bankrupt New Orleans, Opelousas, and Great Western Railroad, and renamed it Morgan's Louisiana and Texas Railroad. In conjunction with his fleet of steamships operating out of Brashear City, Morgan's railroad was able to streamline transportation, commerce, and communication with the west. In 1871, Morgan had a ship channel dredged through the Lower Atchafalaya River in order to facilitate his steamship line. By 1873, Morgan's impact on Brashear City had been tremendous, and had helped bring the region out of the economic depths of Reconstruction. As Goodwin et al. (1985a:78) note, that year the Louisiana legislature changed the name of Brashear City to Morgan City, in honor of the various Morgan accomplishments.

By the end of the century continued economic growth in the region had led to significant population increases, resulting in a shortage of land suitable for cultivation. One solution to the problem that was attempted in several areas of Louisiana during this period was land reclamation. The largest project undertaken in the study region was carried out by John N. Pharr and his sons on Avoca Island. Along with other plantation owners on the island, Pharr organized the Avoca Island Drainage District.

The reclamation work began in the 1890s with the dredging of canals and the construction of levees and a pumping station on the Pharr's Aleda Plantation located on the eastern end of the island. During the succeeding decade the work, by then under the direction of one of Pharr's sons, Eugene, was expanded to include the entire island. By 1914 three major pumping stations, 42 mi of canals, and a levee

system that surrounded the entire island had been built. (The pumping stations constitute archaeological sites 16SMY52, 16SMY60, and 16SMY183.) Apparently, the land-reclamation project was also viewed as a speculative scheme, with a great deal of effort going towards a publicity campaign designed to extoll the virtues of Avoca Island real estate (Gibson and Stout n.d.:5-6). In fact, Pharr was so influential, that he was able to have the new New Orleans-Morgan City highway cross Bayou Chene at the eastern end of Avoca Island, follow the north shore of the island westward to Bayou Shaffer, and then cross Bayou Boeuf to Tiger Island (Gibson and Stout n.d.:5). All of this came to an abrupt end, however, with the flood of 1927. The levees were broken in several places, inundating much of the island's interior. Sale of real estate was then out of the question, and by 1928 the entire venture went bankrupt. Shortly thereafter Avoca Island was acquired by the Whitney Bank of New Orleans at a sheriff's sale (Gibson and Stout n.d.:7).

While not the first town established in Terrebonne, Houma soon became the largest and has remained the principal urban center in the parish to this day. The Houma oyster first made its mark on the national market in 1895. Fifteen years earlier in 1880 the Baltimore oyster dominated the trade while the industry supported 24,000 workers. Oysters were a principal protein component in the diet of many people in the eastern seaboard cities. Baltimore production reached an all-time high in 1884 of 15,000,000 bushels (Maryland Dept. of Natural Resources 2003). However, beginning in 1895 the Houma oyster business grew exponentially, shipping a million bushels by 1901 while the Baltimore oyster yield declined to 6,000,000 bushels.

In 1901 when Houma businessmen first gathered to push for a deep water route to the Gulf, they noted that 600 luggers were engaged in the oyster trade, but had great difficulty getting their produce to Houma, the nearest rail junction. The oysters were unloaded from luggers by air suction and sent to the steamer by conveyer to be brined and cooked in the shell. They were then mechanically shucked (Wurzlow 1985:VIII:97). With a six-foot channel the Houma businessmen argued, the city's oyster business could export 250,000,000 oysters a year. With ten feet of water the town was predicted to become a second Baltimore (Glass 1901:19). By 1905, Houma had indeed become one of the largest oyster shipping ports in the world, exporting both fresh and canned oysters. At least 12 oyster shipping and packing companies were in operation in Terrebonne by 1910 (Lockport Rotary Club 1994:11). The first shrimp-canning factory opened in Houma in 1924 (Castille 1983:2). Shrimping using the gas-powered trawler quickly became an important business and remains so today.

Houma's population grew steadily throughout the historic period; but in the 1920s and 1930s, the city experienced rapid growth due to the discovery of oil and gas in Terrebonne Parish (Castille 1983:3). Terrebonne became the gateway to the heaviest concentration of offshore oil service companies in the state. By 1960, the combination of rich oil production backed by Houma's productive waters, fertile soil and natural mineral resources, enabled Houma to become one of the fastest growing cities in America (Barton et al. 2003). By the late 1970s, Houma's main focus was the oil industry. When the bottom fell out of the industry in the early 1980s due to cheaper foreign product and dwindling local resources, Houma also declined. For nearly two years the Houma-Terrebonne area experienced an unemployment rate near 25 percent. While oil remains the bulk of the parish economy today, Terrebonne also produces over 20 percent of Louisiana's seafood (Barton et al. 2003).

Oil and gas exploration, both in the marshes and swamps of the region and offshore in the Gulf of Mexico, has led to the alteration of much of the area's landscape. Extensive oil-rig fabricating yards have developed along Bayou Boeuf and Bayou Black, reworking and destroying much of the earlier cultural evidence, both prehistoric and historic, for those areas. Hundreds of miles of canals have been dredged for both well sites and pipeline routes, and saltwater has begun to move up these canals destroying large expanses of freshwater marsh. With the loss of the marsh grass, the terrain has broken up and vast areas of open water have developed. Between 1955 and 1978 Terrebonne Parish lost over 116,000 ac of land area due to a combination of subsidence, shoreline erosion, and the breakup of marsh (Wicker et al. 1980).

A circa 1930 map of Township and Sections in Terrebonne Parish prepared by the Parish Assessor's Office, and a similar but perhaps slightly earlier map reflect the growing population and increasingly industrial bent of the parish at this time (Figures 5-16 through 5-18). Coverage begins with the lower portion of the Gabon grant in Sections 32 and 17 (T18S, R17E) (see Figures 5-5 and 5-16). Most of the tract

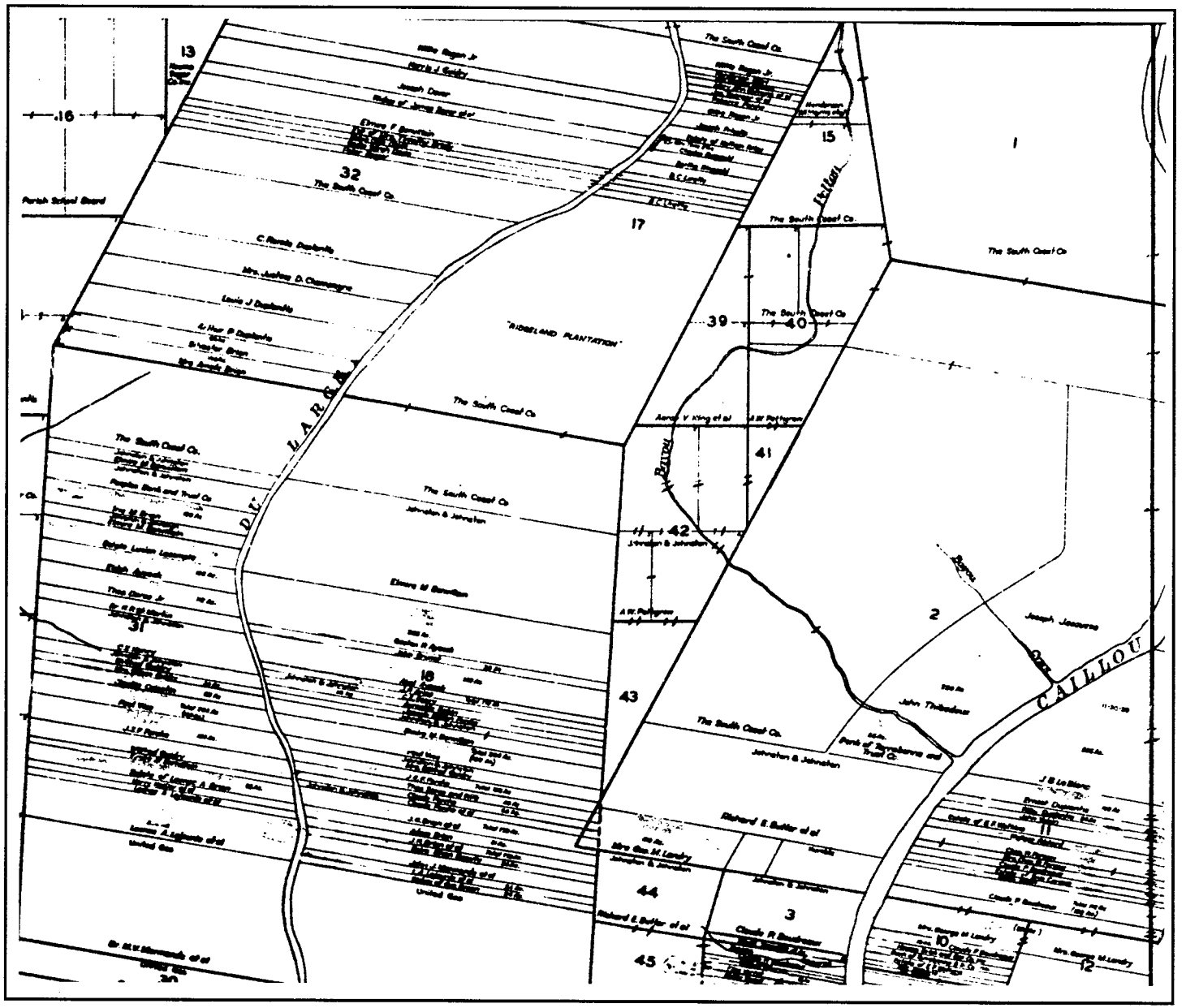


Figure 5-16. A portion of a circa 1930 plat map showing property ownership along the upper end of Bayou Grand Caillou (Terrebonne Parish Assessor's Office ca. 1930).

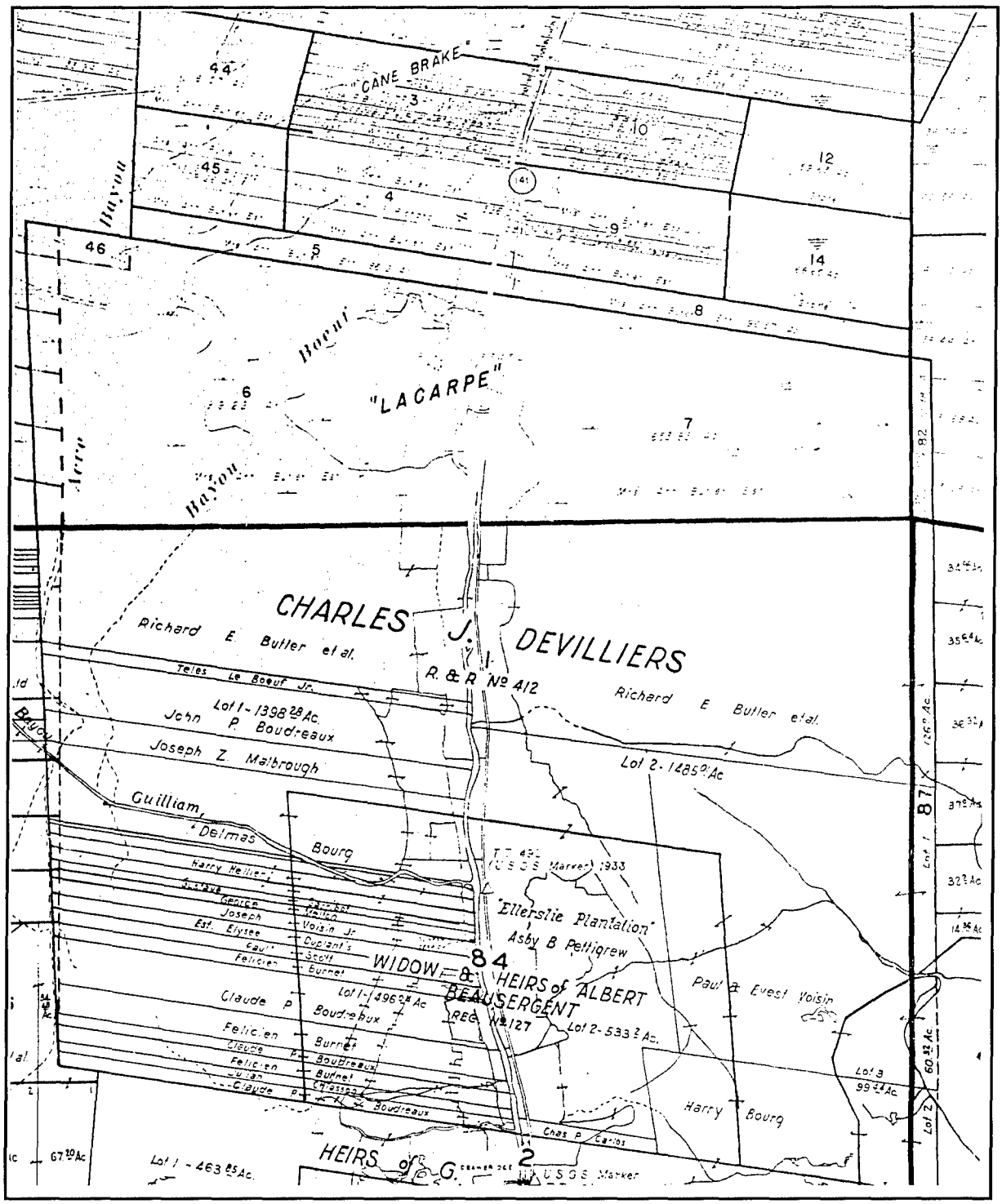


Figure 5-17. A portion of a circa 1930 plat map showing property ownership along the middle section of Bayou Grand Caillou (Terrebonne Parish Assessor's Office ca. 1930).

had been subdivided into some 30 parcels, only a few of which spannned Bayou du Large. The largest tract belonged to the South Coast Co. and was known as Ridgeland Plantation. This company also owned most of the Talbo grant (Sections 2 and 79, T18S, R17E) on Bayou Grand Caillou (see Figures 5-5 and 5-16). This and the adjoining Talredo grant to the north retained the name of Ashland Planta-

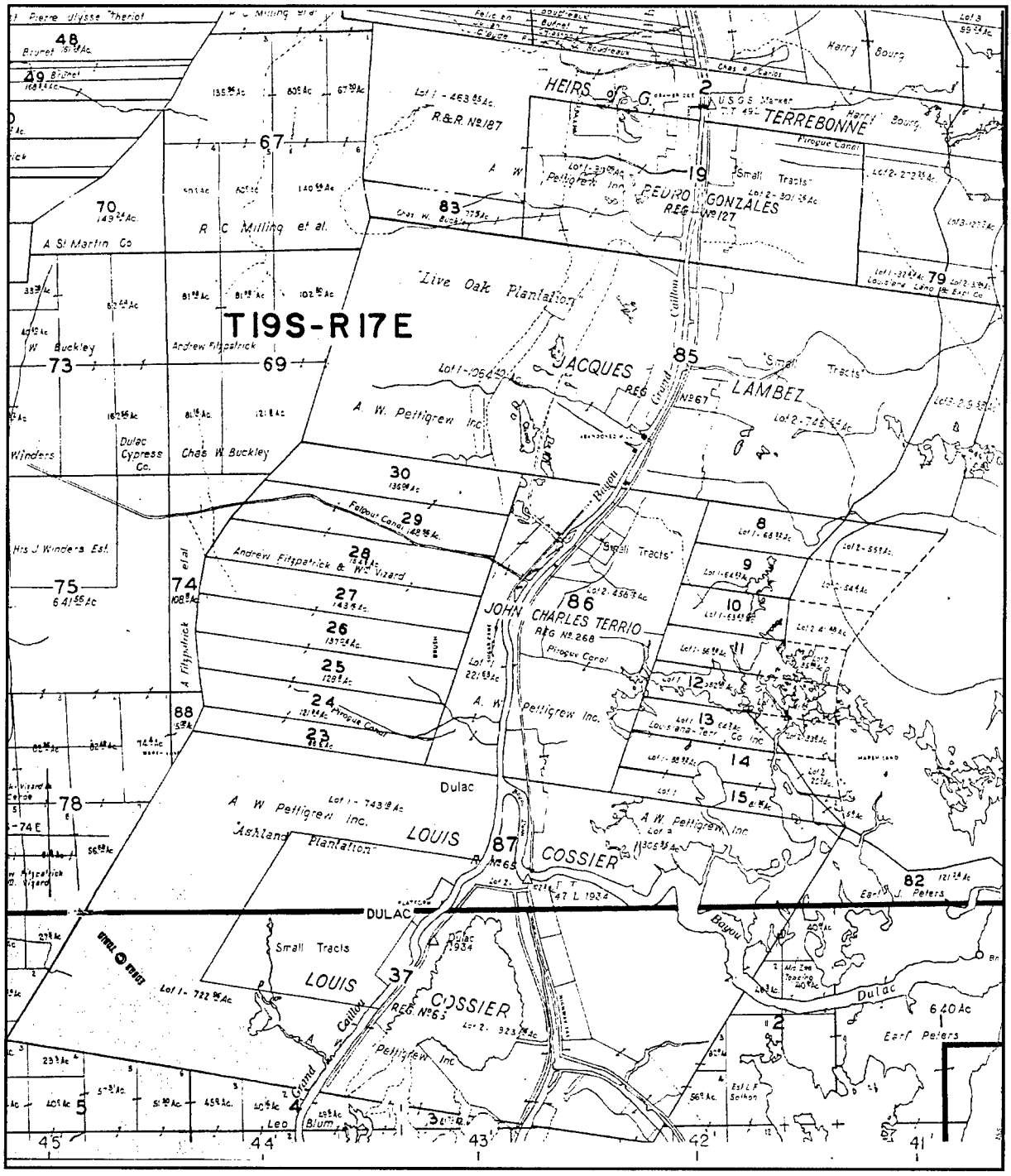


Figure 5-18. A portion of a circa 1930 plat map showing property ownership along the lower end of Bayou Grand Caillou (Terrebonne Parish Assessor's Office ca. 1930).

tion (USGS 1962). The Ashland sugar house and associated buildings appear on the 1931 U.S. Engineer Office map of canals on Bayous Grand and Petit Caillou, Pelton, and La Carpe (Odom 1931) (see Figure 5-14). The Ashland Canal was known as the Caillouet Canal at that time.

Over 40 tracts had been created from the old Felice grant (Sections 18 and 31, T18S, R17E) (see Figures 5-5 and 5-16). Just the southwest quarter of the Devilliers grant (Sections 6 and 7, T18S, R17E; Section 1, T19S, R17E) had been minutely subdivided, while the entire northern half belonged to

Richard E. Butler, et al (see Figures 5-5, 5-6, and 5-17). Paul & Evest Voison and Harry Bourg were the larger landholders on the east side of Bayou Grand Caillou by 1830, in addition to Asby B. Pettigrew who called his land Ellerslie Plantation. Ellerslie apparently once included the Vosion and Bourg tracts as well. Bourg also owned part of the old Terrebonne claim (Section 2, T195, R17E) by 1930.

Another Pettigrew, A. W., held the entire Lambez (Section 85, T19S, R17E), Terrio (Section 86, T19S, R17E), Crossier (Section 87, T19S, R17E; Section 37, T20S, R17E), and Gonzalez (Section 19, T195, R17E) claims by 1930 (see Figures 5-6, 5-7 and 5-18). That land east of the bayou was still known as Dulac Plantation and the property west of Grand Caillou as Live Oak Plantation. (Live Oak is mistakenly labeled "Ashland" on the 1930 Township map). Adjoining Sections 23 through 30, west of the Terrio grant, belonged to Andrew Fitzpatrick & William Visard by 1930, while the Louisiana Terre Company owned adjoining Sections 8 through 15, east of the Terrio grant.

The status of the native Houma population in Terrebonne Parish was documented by Edison Roy, an MA. student at Louisiana State University, in 1959. The Board of Missions of the Women's Division of Christian Service of the Methodist Church had requested LSU's assistance in evaluating their Indian Missions program in the Dulac community. They estimated two hundred Indian families lived in the Dulac community at that time. Other semi-isolated Indian communities existed at "Lower" du Large, L'Isle de Jean Charles, Point aux Chenes, and "Lower" Montegut (Roy 1959). Seventeen years earlier in 1942, a Houma village of palmetto huts and houseboats persisted on Bayou Terrebonne (Hebert 1978:xxvii).

Roy found that 45 percent of Dulac area residents were white ("Cajuns"), and the remainder primarily of Indian and French ancestry. About ten percent were tri-racial. Homes were located along both sides of the roads running parallel to Bayou Grand Caillou, and the population was evenly distributed on each side of the bayou. While all the whites owned their own homes, only 40 percent of the Indians did. About 25 Indians families (19 percent of the Indian population) lived in houseboats dry-docked on the banks of Bayou Grand Caillou and paid rent to a landowner. In 1959 all the Dulac Indians spoke French, and only six percent were bilingual. (Roy 1959).

The Indians often temporarily migrated for employment. As the shrimp factories owned most of the boats, the Indians had to go where ever the packers ordered. There were proportionately fewer females in the Indian population, as they often married whites and left, while the males remained to shell fish. Schools were strictly segregated with white children at the school north of Grand Caillou and the Indian children at "Dulac Indian." A separate school was provided for black children. In the surrounding parishes, however, Indian children were sent to the white schools. Churches were slightly less rigidly segregated in Dulac, with two Catholic churches, one primarily white and the other primarily Indian. The Methodist, Baptist, and Church of God congregations were majority Indian. In 1959 Dulac had 20 grocery and dry goods stores, seven shrimp packing plants, one theater, several beer parlors, two white dance halls, and two Indian dance halls. The first paved road from Houma to Dulac opened in 1958. Max Stanton, another MA student from L.S.U., identified 1,226 Indians living in Dulac in 1960. While whites lived primarily in Grand Caillou and blacks in Bobtown at the upper end of the project area, all the towns along Bayou Grand Caillou were multiracial at this time (Stanton 1971). The Dulac schools were integrated in 1965.

Most of the Dulac Indians today continue to work in the seafood industry, principally at the seafood processors. However, this work is seasonal, resulting in long periods of unemployment (Alice Rothrock, personal communication 2003). The Houma Navigation Canal and the lack of levees on Bayou Grand Caillou have resulted in serious flooding in the Dulac area in recent years (Magnus Voisin, personal communication 2003). In 1992 Hurricane Andrew left five feet of water in the Methodist Community Center parking lot, while Lili in 2003 deposited 2.5 ft. Funding from the Federal Emergency Management Agency has allowed most homes in Dulac to be raised or rebuilt. The Indian community remains deeply concerned about the eventual loss of their homes and livelihood due to the perpetual cycle of storms and subsequent erosion (Alice Rothrock, personal communication 2003).

The Water

Travel by boat was a way of life for many years for those who lived along the bayous in Terrebonne Parish. Natural waterways were numerous and roads were few and those that existed were muddy and impassable most of the time. It was normally only

by boat that one could travel reasonably within the region and reach outlying communities and fishing spots, oyster beds and shrimping grounds. Boats were the backbone for commercial transportation in the region, but they also played a vital role in the areas' religion, sports, education and recreation (Wurzlow 1985:V:32).

The importance of water transportation led to early attempts to improve navigation in the region. By 1823, Terrebonne landowners were required by law to keep clear a 10-foot-wide channel along bayous bordering their lands (Watkins 1937:114). In upper Lafourche Parish a man-made connection had been cut from Bayou Lafourche to Bayou Terrebonne in 1825. This canal greatly improved regional shipments of goods, although it was limited to shallow-draft vessels. This canal was later filled, but in its day it contributed to the movement of produce, such as, molasses, moss and sugar through the wharves at Thibodaux (Rogers 1976). Between 1840 and 1945, numerous water courses intended primarily for transportation were built and improved. In the Lafourche area was the Barataria Canal, which later became the Company Canal. This canal provided a convenient route from Morgan City to New Orleans through a system of natural and man-made water courses. Settlements along the middle reaches of Bayou Lafourche had an easy and safe route into the markets to the east and west. The canal provided a continuous east-west navigable waterway from Bayou Terrebonne to New Orleans. By 1908, traffic along the route had declined. Small fish and vegetable luggers were the principal users. Lumber, sugar, moss and molasses were also part of the canal's commerce (Davis 1973).

A variety of small vessels were involved in travel and commerce along these bayous and canals. These included the local craft such as pirogues, chalands, esquifs and bateau (Knipmeyer 1956), as well as flatboats, luggers, steamboats and, perhaps, keelboats. These vessels were used to move people and to carry the commodities of the region to market, which normally meant travel to New Orleans or to an intermediate location such as Houma, Thibodaux or Donaldsonville where goods were transshipped. Goods moving out of the region included cotton, corn, indigo, molasses, rice, sugar, tafia and lumber (Gould 1951). Sugar, for example, was brought to New Orleans in "pirogues, skiffs, or boats made from solid logs. Each planter has his boat and, . . . could send his crop to market in it—a few hogshead or bales at a time" (Gould 1951:211). Poor records related to this trade provide little insight into the receipts of Louisiana sugar, molasses and rice delivered in this manner. Sailing sloops, schooners and luggers were also involved in this type of trade. While much of the trade was along inland waterways, some vessels traveled along the coast in the Gulf of Mexico. These vessels would have had to utilize the numerous passes leading to gulf waters, including Cat Island Pass, now part of the Houma Navigation Canal.

Prior to the introduction of the steamboat in the area, flatboats or flats were the major type of commercial craft in use on the inland waterways. One particular type of flatboat was the "cordelle" boat which was simply a flatboat pulled with a rope by men, horses or mules using towpaths worn into the natural levee (Butler 1985). Sailboats were cordelled up the bayou, as well, and were also pushed with a pole (Wurzlow 1985:I:154). Even after the introduction of steamboats, flatboats continued in use and, in fact, increased in number after the Civil War. The flatboat was well suited to the narrow and shallow waters of the bayous. In addition, they were cheap and offered an inexpensive means of carrying bulky freight to market. As can be seen, life and transportation revolved around the water. Even in death, funeral corteges often traveled via the pirogue. One such event was recorded, in a cortege from L'Isle de Jean Charles to a church at Point aux Chenes when the deceased traveled in the first pirogue followed by mourners in their pirogues. In fact, the only way to reach L'Isle de Jean Charles was by boat until after World War II (Wurzlow 1985:V:32).

During the Civil War, the coastal area was used by blockade runners, although the effectiveness of the Union blockade limited the numbers of these vessels. Most of these blockade runners were small sailing vessels and little is known about them, but a few larger steamers also attempted to sneak in or out of the area's myriad of waterways. For example, in February 1862 the sidewheel steamer *Victoria* was driven ashore near Fort Livingston by Union ships as she attempted to enter Barataria Bay (Pearson 1993:474). In September 1861, the small Louisiana state "War Schooner" *Antonia* was ordered to the "Timbalier Islands" to assist two schooners "loaded with arms for the State or for the Confederacy" (Pearson 1993:472). It is not known where, or if, the *Antonia* found these vessels. Later, in November 1861, the *Antonia* was sent to Brush Island to remove or destroy any cattle that might be there to prevent Union forces from obtaining them. Brush Island, now almost gone, was located in

Terrebonne Bay not far from Cat Island Pass. The *Antonia* spent some amount of time patrolling the coast attempting to aid blockade runners and searching for local citizens who might be communicating with the enemy blockade ships. In 1864, Union officer Captain Moore was sent to Bayou Grand Caillou to detect Confederate smugglers. Raids were planned and carried out capturing considerable amounts of food and equipment and a few small boats were destroyed. One boat was mentioned that was not captured, a small schooner used as a blockade runner (Official Records of the War of Rebellion [hereafter cited ORE] 1883:927-929).

The great importance of watercraft in the region inevitably meant that boat building would become important. There were some commercial builders in the area, but many built boats primarily for personal use, family or friends. One of the commercial builders along Bayou Terrebonne was John A. Boyne and his sons John Madison, Andrew and Bill. They had two boatways and one boat they built, the *Helen Snow*, was named for a daughter of one of the boat owners who was born in 1895 during the "deep freeze" when the bayou froze and Houma was covered with 18 inches of snow. The Boynes, as did others, built their boats out of cypress, which grew in abundance in the Terrebonne swamp (Wurzlow 1985:V:33).

A description of the old Boyne Boat Ways is given in the following reminiscence by Ovide Bazet:

> This is my conception of the old Boyne boat Works on lower Bayou Terrebonne at Madison's Canal in about the year 1910, at which time I was 10 years old. The boat tied to the wharf is the type they specialized in at that time. It was a wide semi-round bottomed boat with graceful curves... It resembled a large wide scoop with a box on top. There was barely enough space in the cabin for the gasoline engine. The boat was steered on the outside from the rear. There was a large, compartment in the front under the foredeck where the catch of shrimp, fish or oysters was stored in ice until it arrived in Houma. This compartment which was opened by a trap door on the deck was called the "hole". This boat was called a "lugger". In spite of the excellence of workmanship and its gracefulness in the water, the boat was built for hard work. It was designed to navigate the shallow lakes, bayous and bays of which the coast of Terrebonne Parish is noted. Using only hand tools, carpenters at that time took much pride in their work and regardless of the time involved to build a boat, excellence of workmanship took priority. Every boat could be called a work of art [Wurzlow 1985:V:35].

The Rhodes were another boat-building family in the area. Ernest Rhodes was the founder of one of the first and largest boatways along Bayou Terrebonne at the turn of the century. It was located about a mile below Bush Canal. Ernest was the oldest of four brothers, the others were Frank, Gustave and George. They were the sons of Thomas Rhodes, who was a sea captain. Ernest had seven sons and two of them, Elie and Lawrence, became boat builders. Elie worked for the Houma Boat Company, a branch of the Higgins Boat Company of New Orleans, during World War II building P-T boats, landing boats and Navy boats. Elie Rhodes built many boats after World War II himself, all out of cypress. He considered cypress to be the best boat wood noting that:

> Nothing beats cypress for boats. No other wood will take the water like cypress. Another thing, good cypress does not have as many knots in it as other woods. Wherever a limb grows out, you will find a knot in the wood. When cypress trees grow close together in the swamp, they grow up tall before the limbs come out [Wurzlow 1985:V:37].

By the 1950s, when Elie could not find good cypress anymore, he went into the fishing industry catching fish, shrimp and oysters.

Beginning in the third decade of the nineteenth century, steamboats began to travel the waters of the Terrebonne region. Bazet (1934:37) reports that the *S.F. Archer* was one of the first steamers to operate exclusively in Terrebonne Parish. Built along the Ohio River at New Albany, Indiana, in 1854, the sidewheeler *Archer* was owned by J.J. Schaffer & Company and traveled along Bayou Black, making connections with the railroad at Tigerville (Gibson) (Way 1994:407). Other steamers operating in the region were the *Harry, Laura, Sadie Downman* and the *N. H. Breaux* to name just a few. The *Harry, Laura* and the *Sadie Downman* belonged to the Daigle Barge Line, whose founder was Emile A. Daigle. The *Harry* and the *Laura* were the first big steamers on the Terrebonne in 1881, and also plied bayous Petit and Grand Caillou (Lockport Rotary Club 1994:26). They carried only freight in the early days, and would haul barges loaded with lumber, sugar,

and produce to Houma to be shipped to New Orleans. They would then carry groceries, dry goods and other supplies on the return trip. In the early steamboat days Daigle would dredge the Terrebonne in Houma at his own expense to keep his boats running. He also had a wharf in town where he built barges and had a crew of painters and carpenters to maintain his boats. Emile Daigle had a large interest in the drayage business and owned several landings and wharfs along the Terrebonne by 1910. He was a charter member of the Houma Fish and Oyster Company and had an interest in an oyster shop at Sea Breeze. The *Harry* and the *Laura* also towed long strings of barges loaded with "Beaumont" oil.

> Sometimes you could see as many as eight or 10 barges trailing behind one of the big boats. The last barge had a long chain dragging an anchor to keep the tow from swinging. You could always tell where the anchor was by the stream of bubbles [Houma Daily Courier, Sept. 26, 1971].

The *N. H. Breaux* succeeded the *Laura* and was the last steamer on the Terrebonne in 1930 (*Houma Daily Courier*, Sept. 26, 1971).

Some information on commercial traffic on the waterways of the lower Terrebonne region can be obtained from records published by the Corps of Engineers in the Annual Reports of the Chief of Engineers. However, these records are generally available only for the time period after about 1880. One of the area's waterways for which commercial traffic and navigation information are available is Bayou Petit (or Little) Caillou, one of the waterways leading into western Terrebonne Bay. Measuring about 28 miles long, Little Caillou is considered part of the Lafourche system. The upper channel was reportedly filled and was no longer considered navigable by 1882. At that time, the water depth at the channel mouth was from 2 to 11 feet. During the late nineteenth century, several man-made canals, generally about 4 feet deep, connected Bayou Little Caillou with other waterways (ARCE 1882:1413-1414). No information is provided on commerce for Little Bayou Caillou until the 1930s, apparently suggestive of the minimal amount of commercial traffic traveling along the bayou. Data for the year 1935 are shown in Tables 5-2 and 5-3. As can be seen, the vessels used were "motor" vessels and barges and much of the commerce reflected the oystering and shipping activities of the area.

Bayou Grand Caillou is about 28 miles long and empties into Caillou Bay. In 1882, this channel was entirely filled at the upper end and was open with 5 to 8 feet of water throughout most of its lower segment. Vessels traveling on Grand Caillou did not draw more than 7 feet of water (ARCE 1882:1411-1412). No commercial statistics were obtained for this water body for the period prior to 1936.

Bayou Terrebonne represents a major navigable segment of the Bayou Lafourche system. During the early nineteenth century, Houma served as the head of navigation on Bayou Terrebonne. By 1880 the channel above Houma was nothing more than a drainage ditch and was useless for navigation. Below Houma the channel was a shallow tidal bayou. Ultimately, Houma, because of its advantageous location became the major port town in the region. Numerous businesses and facilities for handling boat-borne merchandise developed in the town. As noted earlier, sugar and lumber were major commodities handled at Houma, but many other goods also passed through the town's docks. Castille and Holmes (1983:26) note the importance of the oyster packing industry in the town by the 1920s and report that commodities such as animal furs, cattle and alligator hides and frog legs were packed in barrels with layers of salt and shipped, primarily to New Orleans. In 1880, two steamers traveled the lower end of Bayou Terrebonne "bringing freights from plantations on Terrebonne and other connecting bayous to Houma for shipment by rail" (ARCE 1880:1179-1180).

The greatest part of the freight up the Terrebonne was sugar and molasses from the many sugar plantations in the region. Navigation of the upper end of Terrebonne near Houma was done at high tide, which, depending on the winds in the bays, often gave an additional 2 feet of water. Prior to 1880, commerce on the upper Terrebonne was handled "by flatboats which were cordelled and poled from plantations up to Houma" (ARCE 1880:1179-1180). There was a connection by rail at Houma with Morgan's Louisiana and Texas Railroad where freight was then shipped to market. Schooners and sloops also carried a considerable amount of freight through the bays and connecting bayous to New Orleans (ARCE 1880:1179-1180). Some of these vessels, at times, would have sailed out into the Gulf of Mexico, using one of the several available passes, including Cat Island Pass.

Information on the commercial statistics for Bayou Terrebonne for the year 1915 for registered

Table 5-2. Trips and Drafts of Vessels on Bayou Petit Caillou for 1935 (after ARCE 1936:631).

	Up-bound				Down-bound			
Draft (feet)	Steamers	Motor Vessels	Barges	Total	Steamers	Motor Vessels	Barges	Total
6		14	1,203	1,217		14	1,193	1,207
5	200	714	123	1,037	200	714	113	1,027
4	52	353	352	757	52	364	342	758
3		1,429	242	1,671		1,429	232	1,661
2		166	264	430		133	313	446
Total	252	2,676	2,184	5,112	252	2,654	2,193	5,099
Total net registered tonnage	3,012	19,577	219,785	242,374	3,012	19,253	223,840	246,105

Section included: 36 miles. Controlling depth: 6 1/2 feet. Project depth: Navigation season: Entire year.

(after ARCE 1936:631).

Table 5-3. Commerce on Bayou Petit Caillou for 1935 (after ARCE 1936:627).

Domestic

In-Bound	Tons	Out-Bound	Tons
Animals and animal products:		Animals and animal products:	
Oysters, unshucked	355	Oysters, canned	80
Shells	2,950	Shrimp, canned	200
Shrimp, dried	26	Shrimp, dried	50
Shrimp, fresh	295	Shrimp, bran	100
Shrimp, bran	70	Wood and paper:	
Nonmetallic minerals:		Cordwood	25
Gasoline	225	Logs, barged	457
Oil, fuel, and gas	1,200	Nonmetallic minerals: Gasoline	50
Oil, lubricating	15	Unclassified: Ice	1,100
Total	**5,136**	**Total**	**2,062**
Value, $54,0095		Value, $80,377	
		Total, all traffic	**7,198**
		Value, $134,472	

(after ARCE 1936:627)

Table 5-4. Commerce on Bayou Terrebonne for 1935 (after ARCE 1936:630-631).

Domestic

In-Bound	Tons	Out-Bound	Tons
Animals and amimal products:		Animals and animal products:	
Fish	1	Dairy products	15
Lard	125	Lard	5
Milk, canned	188	Meat	33
Oysters, unshucked	2,553	Vegetable food products:	
Seafoods, canned	300	Flour and meal	10
Shells	2,600	Fruits and vegetables, canned	56
Shrimp, dried	117	Fruits and vegetables, fresh	50
Shrimp, fresh	2,397	Rice, cleaned	7
Shrimp, bran	147	Sirup and molasses	4
Vegetable food products:		Sugar, raw	8,352
Beans and peas, dried	1,100	Sugar, refined	16
Beverages	115	Sugarcane	5,322
Coffee	200	All other	25
Flour and meal	32	Textiles: Rope	4
Fruits and vegetables, canned	43	Wood and paper:	
Hay and feed	126	Cordwood	30
Oats	25	Lumber	2,000
Potatoes	75	Piling and poles	300
Rice, cleaned	125	Nonmetallic minerals:	
Sugar refined	120	Baroid	1,600
Sugarcane	15,677	Bunker oil	720
Textiles	17	Cement	800
Wood and paper:		Coal, anthracite	100
Logs, barged	457	Drilling mud	20,000
Paper and manufactures	19	Gasoline	459
Nonmetallic minerals:		Grease, lubricating	10
Bunker oil	7,060	Oil, crude	5
Oil, fuel and gas	2,056	Oil, fuel and gas	1,230
Oil, lubricating	160	Oil, lubricating	159
Sand and gravel	6	Salt	15

(continued)

vessels shows a total of 7 steamers and 12 gas boats operating on the bayou at that time. The steamers carried a total of 1,500 passengers. For unregistered vessels there were 375 gas boats and 150 unrigged barges. The freight that was carried during the year consisted of a variety of articles. The item that had the greatest value was sugar, valued at $1,132,000. A large quantity of logs was shipped in that year; 15,604,300 feet or an equivalent of 62,417 short tons, reflecting the importance of the timbering industry

Table 5-4. Concluded.

Domestic

In-Bound

	Tons
Ores, Metals and manufactures of:	
Iron and steel, manufactured	120
Iron and steel, rolled	800
Machinery and vehicles: Machinery and parts	1,201
Chemicals:	
Ammunition	32
Soap	150
Unclassified:	
Matches	22
Roofing	185
All other	393
Total	**38,744**

Value, $1,244,216

Out-Bound

	Tons
Ores, metals and manufactures of:	
Iron and steel, manufactured	450
Iron and steel, rolled	3,200
Machinery and vehicles: Machinery and parts	4,250
Chemicals:	
Explosives	20
Soap	3
Unclassified:	
Ice	2,671
Water, boiler	25,000
All other	1
Total	**76,922**

Value, $407,748

Up-Bound

Vegetable food products:	
Sugar, raw	6,000
Sugarcane	3,944
Total	**9,944**

Down-Bound

Vegetable food products: Sugarcane	3,661
Value, $16,474	
Total, all traffic	**129,271**
Value, $4,004,271	

(after ARCE 1936:630-631)

in the early years of this century. Other commodities shipped in large amounts were ground and grain feed, fertilizer, molasses, fuel oil, oysters, potatoes and miscellaneous merchandise. Smaller quantities of brick, cement, coal, cooperage, lime, lumber, machinery, naval stores, pilings and cypress ties were shipped, as well as, agricultural products such as, corn, eggs, furs, fish, hides, moss, oats, rice, salt, and shrimp (ARCE 1916:2449-2450). Between 1888 and 1935 freight tonnage on the Terrebonne increased from 5,416 to 115,666 tons (Table 5-4). During roughly the same period steamship traffic increased from 15 to 252 trips and barges made from 9 to 2184 trips (Table 5-5). As on other waterways, barges represent the deepest draft vessels by 1935.

These published commercial statistics provide information on the types of vessels and cargoes traveling along the area's waterways, but they do not convey information on the innumerable small craft that were

Table 5-5. Trips and Drafts of Vessels on Bayou Terrebonne for 1935 (after ARCE 1936:631).

Draft (feet)	Up-bound				Down-bound			
	Motor Vessels	Barges	All Other	Total	Motor Vessels	Barges	All Other	Total
6	3	157		160	3	157		160
5	172	138		310	172	138		310
4	224	121	3	348	224	121	3	348
3	656	48	1	695	656	38	1	695
2	129	11		140	129	11		140
Total	**1,184**	**465**	**4**	**1,653**	**1,184**	**465**	**4**	**1,653**
Total net registered tonnage	**5,706**	**33,077**	**265**	**39,048**	**5,706**	**33,077**	**265**	**39,048**

Section included: Terrebonne Bay to Terrebonne Bayou, 32.8 miles. Controlling depth: 5 feet. Project depth: 5 feet. Navigation season: Entire year.

(after ARCE 1936:627-628)

in use. Large numbers of small vessels, many if not most locally made, were in use in the area from the very earliest periods until today. These included such local vessels as pirogues, bateaus, flats, sailing luggers and the like.

Dredging was considered a standard means to improve navigation in the bayous and streams in the area, but other measures were also explored. An interesting observation noted in Bayou Teche was that steamer traffic had a direct effect on the movement of sediments in the channel, especially on the smaller or narrow streams. It was observed that:

> Side-wheel steamboats, such as are below New Iberia, and not above, are so constructed that there is a strong current from their wheels washing the bottom from some distance away from the mid-channel out to the banks, but no current at all in the middle, consequently the heavier portion of the material washed up is deposited in mid-channel behind the boat, and the swell of the boat, which is greater than that from a stern-wheel boat, washes the banks, and causes the widening of the surface. The stern-wheel boat spends the force of its engines on the one wheel at its stern, and the current from it washes up the bottom in the center of the bayou only, and the tendency of the heaviest part of the material washed would be to the more quiet water of the sides. So it would have a tendency gradually to improve the navigation, while the side-wheel boat far more rapidly destroyed it [ARCE 1880:1169].

Bayou Terrebonne was once an outlet of the Mississippi River via Bayou Lafourche, but due to a closure at Bayou Lafourche in the years prior to 1880, the upper bayou silted in and navigation above Houma became impossible. Below Houma, Bayou Terrebonne was tidally influenced and became a very important navigable waterway for the large plantations and smaller farms downstream. In a Corps of Engineers survey report in 1880, Bayou Terrebonne was examined in some detail in preparation of dredging the following years. The report notes that the roads along the bayou were useless for moving freight. The best avenue depended on the navigation of Bayou Terrebonne, which also connected with other bayous to get produce to market.

Dredging of the Bayou Terrebonne channel was initiated in 1881. Before completion of the first dredging, the bayou at Houma was reportedly 40 feet wide and 4 feet deep, and at low water it was only 10 feet wide and 6 inches deep (ARCE 1889:1508). All navigation at the upper end of Bayou Terrebonne was done at high tide. Above the entrance of Bayou Cane the channel was practically dry. The towboat *Harry*, stationed at Houma, sometimes ascended to the mouth of Bayou Cane during high water (ARCE 1887:1397). This towboat was about 18 feet wide and had a draft of only 18 inches (ARCE 1891:1844). The 1881 dredging project created a 6-foot-deep channel below Houma. Local drainage ditch discharges created shoals that again reduced water depths. In 1885 only one or two small steamboats traveled the lower channel (ARCE 1885:1407). Dredging of a 4-foot channel from the mouth to the railroad depot at Houma was begun in 1880 and completed in 1887 (ARCE 1888:1250). By 1886, channel improvements were sufficient to allow one or two small steamboats to periodically run to Houma (ARCE 1886:1265).

A hurricane of September 1909 devastated the riverine system below Houma, clogging all the channels, many with silt as well as trees and debris. Using a prior emergency appropriation authority, the U.S. Army Corps of Engineers dredged 4,500 feet of the Bayou Terrebonne and 4,400 feet in Little Bayou Caillou. The rivers and harbors act of June 25, 1910 created a new project to dredge Bayou Terrebonne, apparently ignoring the other waterways. The purpose of the new program was to dredge a six-foot channel down Bayou Terrebonne from Houma to deep water (ARCE 1912). During the later part of 1915, the dredge *Delatour*, dug a channel from the St. Louis Cypress Company bridge in Houma to Bush Canal, the end of channel improvement. The channel was dug to a depth of 6 feet and a bottom width of 50 feet (ARCE 1916:2449). The Intracoastal Waterway (IWW) was constructed through Houma in 1923 and later extended to Bayou Lafourche in Lafourche Parish (Barton et al. 2003).

In 1930 business leaders convened another meeting to pressure the U.S. Army Corps of Engineers to provide a deep-water channel from Houma to the Gulf (U. S. Congress 1931:5). Major R. F. Fowler prepared a survey and plan for dredging a channel down Bayou La Carpe to Bayou Pelton, and then to Bayou Grand Caillou as far as Dulac. Congress approved a dredging project in the River and Harbor Act approved August 30, 1935. The project was for a five-foot channel from the intersection of Bayou La Carpe with the Intracoastal Waterway at Houma southward within the bayou, utilizing Bayou La

Carpe, Bayou Pelton, and Bayou Grand Caillou to Bayou Dulac. The distance of this project was 16.3 miles. The Corps noted several private wharves along these waterbodies and a number of stiff-leg derricks for handling cane (ARCE 1936: 712-3).

In 1935 a group of Houma businessmen again got together to push for the ship channel south to the Gulf. They published a booklet entitled "Houma Ship Canal" by the Houma-Terrebonne Chamber of Commerce, Julius Dupont, President. John H. Bernhard, 816 Howard Avenue, New Orleans, prepared the study that was to be the basis of the public hearing. Two years later the Houma Harbor and Terminal District issued a report by Frederic R. Harris of New York, in consultation with John H. Bernhard of New Orleans. This report also urged the canal (Frederic R. Harris, Inc. 1937). In February 1939 the Board of Commissioners of the Houma Harbor and Terminal District issued a flyer arguing the case for the HNC. The commissioners were Julius Dupont, President; F. P. Guidry, Vice President; Dr. M. V. Marmande, Treasurer; D. W. Pipes, Secretary; and J. J. Munson. John H. Bernhard was the Consulting Engineer. The flyer explained that current oil development in the parish would expire in fifteen years, and that the Parish must be ready for new business. "We now have rail connections to take care of a Trainload, the Intracoastal Canal to take care of bargeloads, highways to take care of Truckloads, but unless we acquire the Houma Ship Canal to move Shiploads we can never hope for really industrial development" (Board of Commissioners of the Houma Harbor and Terminal District 1939).

Planning for the Houma ship canal were placed on hold during World War II. One of only two blimp naval stations on the Gulf Coast was established at Houma and operated from May 1943 to September of 1944. Blimp squadrons were used to scan the coastline for enemy vessels (Barton et al. 2003).

1954 was the year that the pro-canal forces coalesced once again. On January 13, 1954 the Terrebonne Parish Police Jury appointed several prominent citizens to a Terrebonne Parish Deep Water Channel Committee: M. L. Funderburk, chairman; J. J. Munson, vice-chairman; Louis E. Routier, secretary; Gibson J. Autin, Alvin J. Boudreaux, James J. Buquet, Capt. Ovide J. Cenac, T. B. Holcombe, Butley Mahler, Thaddeus Pellegrin and A. Dupre Vaeth. The U.S. Army Corps of Engineers was interested in the project, but the parish felt a COE project would take too many years of study. The committee could see the rapid expansion of the oil industry south of Houma and knew the canal project could not wait. $37,960 in local planning money was quickly raised and led to the passage of a $3,500,000 bond issue on December 20, 1955 (*The Waterways Journal* 1962:19). The Parish also recruited and received the aid of the State Department of Public Works, which completed many of the surveys for the project.

The next step was to secure a permit to dredge through the marshes from the U. S. Army Corps of Engineers. This process took six months over the winter of 1957-1958, and went smoothly until the Corps brought up the question of increased salt water intrusion into the marshes. On January 6, 1958 Thaddeus M. Pellegrin, President of the Parish Police Jury, wrote to Colonel William Lewis, Chief Engineer of the New Orleans District. He pointed out that for decades the Parish had been trying to secure agreement from among the many parties as to which of the natural bayous to deepenæTerrebonne, Petit Caillou, Grand Caillou, or du Large. Based on the surveys, the Parish had proceeded to acquire ninety-five percent of the land rights for the HNC. The President then objected strongly to the new Corps position regarding salt water intrusion. The objection was received and at the end of the month Colonel Lewis delivered the permit dated January 29, 1958 to the Parish. The permit was in accordance with the State Department of Public Works map entitled "Map of Proposed Houma Navigation Canal, Terrebonne Parish," dated December 1957 (Louisiana State Department of Public Works 1957).

The parish acquired a 600-foot right of way for the Canal, and dug it out initially to a 300-foot top width, 150-foot bottom width and a 16-foot depth. While Houma is seven feet above mean sea level (amsl), the elevation drops to only two feet just one-half mile to the south. For the next twenty-four miles the average elevation is two and one half feet amsl. The final twelve miles of the route were chiefly in open wateræeight miles in Terrebonne Bay and four miles in the Gulf of Mexico. The first half-mile of the canal from its intersection with the Intracoastal was dug through farmland. From there the Canal cut through swampland dotted with moss-draped trees. The prime contractor, the Walter P. Villere Company of New Orleans, divided the task into four parts and took on half of it with Villere men and equipment. Villere sublet the southernmost ten miles to F. J.J. Sloat Dredging Company, of Slidell, La. The Sloat firm then sublet a portion of its ten miles to Jahncke

Service, Inc., New Orleans. Villere sublet the seven miles north from the upper end of the Sloat portion to the Monroe J. Wolfe Company, New Orleans.

The Houma Navigation Canal opened in June 1962. The River and Harbor Act of 23 October 1962 (U.S. Congress 1962) authorized the maintenance of a canal 15 feet deep and 150 feet wide from Houma to Cat Island Pass. The total length of the canal was 40.5 miles long with 10 miles in Terrebonne Bay and 3.9 miles in the Gulf of Mexico. In 1973 Congress authorized the deepening of the channel through Cat Island Pass and out to the 18-foot contour line to 18 feet with a width of 300 feet (U.S. Army Engineer District 1975: 5). With the opening of the HNC, the intersection of the HNC and the Intracoastal Waterway rapidly became a Mecca for the oil field industry and remains so today. Residents of the project region blame serious flooding in recent years on the Houma Navigation Canal and the lack of levees on Bayou Grand Caillou. Levees have been built along bayous du Large and Petit Caillou. At one time flood gates were planned at Bayou Plat, south of Wax Bayou, but these were never built. Some residents fear more dredging of the HNC until a lock system is in place to protect them from storm surges (Magnus Voisin, personal communication 2003).

CHAPTER 6

RESULTS

This Chapter presents the results of the background research and field reconnaissance conducted for the proposed project. Previously recorded cultural resources in the project region are discussed first. Descriptions of new cultural resources noted during field investigations are then provided.

Known Cultural Resources in the Project Area and Near Vicinity

Archaeological Sites

A review of the archaeological site files at the State of Louisiana Division of Archaeology revealed just three sites actually within the footprint of the proposed construction—16TR12, 16TR18, and 16TR72. Three additional sites in close proximity to the HNC along Bayou Petit Caillou were also noted—16TR13, 16TR14, and 16TR15 (Figure 6-1). All of these sites were recorded well before the creation of the Houma Navigation Canal, and their status was unknown at the start of the present study.

Sites 16TR12 through 16TR15 and 16TR18 were recorded by William McIntire in 1951 and are included in his important work on prehistoric habitation within the changing Louisiana coastal zone (McIntire 1958). All are shell middens on Bayou Petit Caillou that have been extensively eroded leaving, in most cases, only a wave-washed beach deposit along the bank of the bayou. Only 16TR12 produced diagnostic ceramics, and these date primarily to transitional Coles Creek and early Plaquemine times, although a few shell-tempered sherds argue for a late prehistoric component as well (McIntire 1958:Plate 13). Neuman classified 16TR12 simply as Mississippian (Neuman 1977:22). 16TR13 and 16TR15, according to Neuman, are Coles Creek in age, while 16TR14 dates to the Plaquemine period. The evidence to support these determinations, however, is not provided. Neuman was unable to date 16TR18 due to a lack of data.

Randolf A. Bazet recorded site 16TR72 on Four Point Bayou in 1953. Jeffery H. Altschul then revisited the site in 1978. At that time 16TR72 was described as a wave-washed and bulldozed shell midden that might retain some physical integrity. Altschul (1978:Table 14) recovered ceramics indicative of a Plaquemine occupation, probably dating between A.D. 1200 and 1500.

All six of these sites were revisited as a part of this study to verify their true locations and determine their current conditions. As noted earlier, all six sites were originally reported over 50 years ago and only one has been examined since then. The main goal of these revisits was to aid in determining the extent of site damage and site loss the project area has experienced since extensive saltwater in-

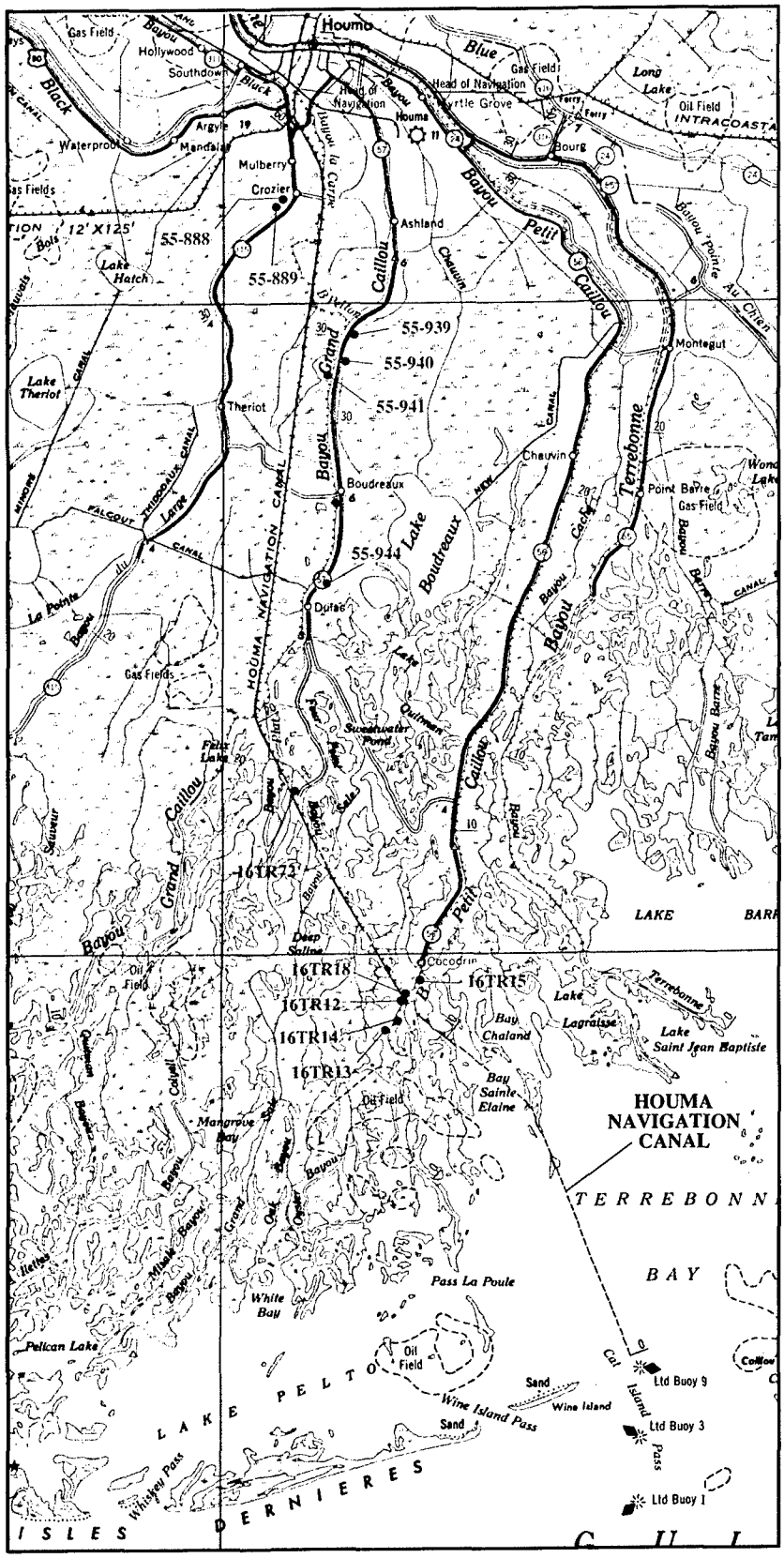


Figure 6-1. Known archaeological sites and standing structures within or immediately adjacent to the project area.

trusion and marsh deterioration began. By comparing the original site descriptions, most of which were made prior to extensive impact from oil and gas activities, with the present natural conditions, a prediction on the extent of damage suffered by other sites in the area might be made.

16TR12 straddles a small point on the northwest corner of the intersection of Bayou Petite Caillou and the HNC (see Figure 6-1 and Plate 5). Wave washed oyster and rangia shell was noted along the banks of both waterbodies (Figure 6-2). Oyster shell is predominant. A single sherd of Baytown Plain, *var. Addis* was collected from the site along the bank of the HNC (Table 6-1).

16TR13 lies on the west bank of Bayou Petit Caillou and has been bifurcated by a canal (see Figure 6-1 and Plate 5). Wave washed oyster and rangia shells were noted on both sides of the canal, and again, oyster shell was most common (Figure 6-3). A moderate amount of pottery (n=31) was collected from the east bank of the canal, as well as the vertebra of an immature pig (Table 6-1). The ceramics include Coles Creek Incised, *vars. Hardy* and *unspecified*; Baytown Plain, *var. unspecified*; and Mound Place Incised on a Baytown Paste (Figure 6-4). Several of the sherds from this site are large and not very water worn, suggesting that some intact portion of the site has only recently begun eroding.

Site 16TR14 lies on the east bank of Bayou Petit Caillou, opposite sites 16TR12 and 16TR13 (see Figure 6-1 and Plate 5). Two exposures of wave-washed shell were noted, again consisting mostly of oyster and some rangia shell (Figure 6-5). Only a single sherd of Baytown Plain, *var. unspecified* was recovered from this site (see Table 6-1).

Site 16TR15, also on the east bank of Bayou Petit Caillou, was the most productive and apparently most intact site examined during this inspection (see Figure 6-1 and Plate 5). The site appeared as a low rise with two tree stumps on it and was surrounded by marsh (Figure 6-6). Oyster and some rangia shell, plus a heavy concentration of both grog- and shell-tempered pottery (n=80) were noted on the surface of the site, and not simply at the base of a wave washed bank (see Table 6-1). Grog-tempered types predominate and include: Anna Incised, *var. unspecified*; Baytown Plain, *var. unspecified*; Coles Creek Incised, *var. Hardy;* Mazique Incised, *vars. Manchac* and *unspecified*; and Mound Place Incised on a Baytown Paste (see Figure 6-4). Three body sherds of Mississippi Plain, *var. Yazoo* and a large

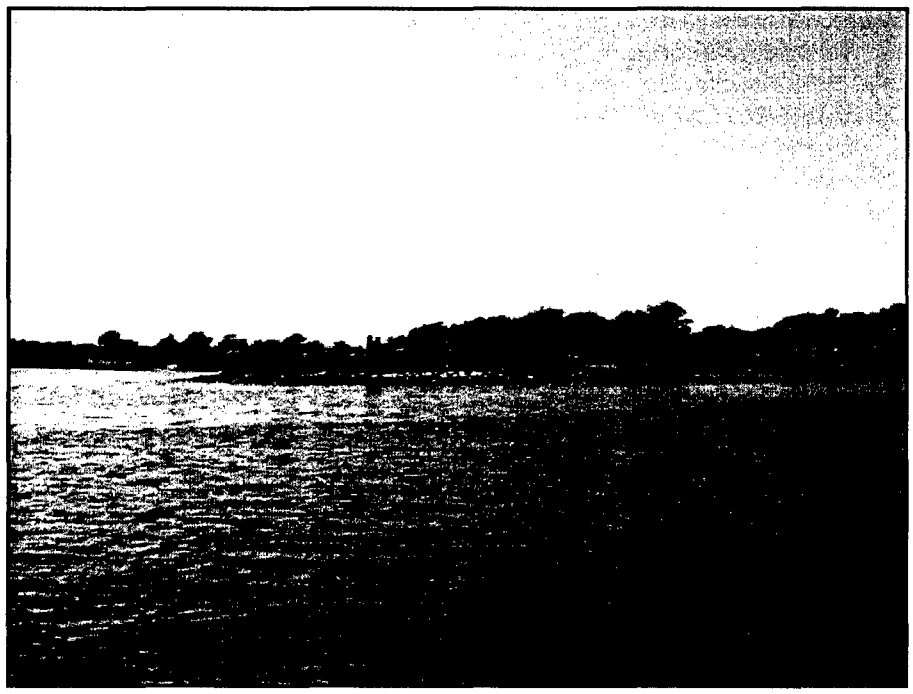


Figure 6-2. Site 16TR12 within the project area. View to the northwest. Date: 10/23/03.

Figure 6-3. Site 16TR13 adjacent to the project area. View to the northwest. Date: 10/23/03.

piece of daub were also collected. Several of the sherds from this site are large and not very water worn, suggesting that some intact portion of the site has only recently begun eroding. The fact that the shell has not yet leached out of one of the *var. Yazoo* sherds lends credence to this interpretation.

16TR15 also has an historic component represented by a complete molded and lipping-tooled bottle, ironstone plates and saucers, and stoneware crocks and bowls (Figure 6-7). The bottle was produced by the Adolphus Bush Glass Manufacturing Co. in Belleville, Illinois or St. Louis, Missouri between 1886 and 1928 (Toulouse 1972:26). One of the ironstone plate fragments is marked "WARRANTED" indicating manufacture after 1890 (Kovel and Kovel 1986:233). This historic material probably represents a fishing camp dating to the late nineteenth and early twentieth centuries.

Located at the northeast intersection of Bayou Petit Caillou and the HNC is site 16TR18 (see Figure 6-1 and Plate 5). Wave-washed oyster with some rangia shell was noted along the banks of both waterbodies (Figure 6-8). Approximately two feet of spoil has been dumped on top of this site in an effort to prevent further bankline erosion. One sherd of Baytown Plain, *var. unspecified* and another of Coles Creek Incised, *var. unspecified* were collected from the bank of the site facing Bayou Petit Caillou (see Table 6-1).

A probable site was also noted on the south bank of Bayou Petit Caillou where it intersects with Little Cocodrie Bayou (see Plate 5). A temporary site number was not assigned to this locale as it lay outside the project area and was not visited during the reconnaissance survey. However, the presence of shell on the bank at the intersection of these two significant bayous strongly suggest that an archaeological site is indeed present there.

The final known site in the project area, 16TR72, lies on the west bank of Four Point Bayou (see Figure 6-1 and Plate 4). This site has apparently been severely impacted by the construction of a wharf and marina (Figure 6-9). No evidence of 16TR72 was noted during this examination, but it is possible that remains survive beneath these modern structures.

Standing Structures

Just 17 structures in Terrebonne Parish are listed on the National Register of Historic Places, and none lie in the proposed project area (Table 6-2). The listed structures consist of two churches, one store,

Table 6-1. Artifacts Recovered from Sites in or Adjacent to the Project Area.

	16TR12	16TR13	16TR14	16TR15	16TR18	HNC-1	HNC-2	HNC-3	HNC-4	HNC-5	HNC-6	HNC-7	
	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	TOTAL
HISTORIC CERAMICS													
Refined Earthenware													
Ironstone													
Undecorated													
flatware	—	—	—	1	—	—	—	—	—	—	—	—	1
plate	—	—	—	2	—	—	—	—	—	—	—	—	2
saucer	—	—	—	2	—	—	—	—	—	—	—	—	2
unidentified	—	—	—	2	—	—	—	—	—	—	—	—	2
Stoneware													
Slip (int.)/Salt (ext.)													
crock	—	—	—	3	—	—	—	—	—	—	—	—	3
Slip Glazed (int. & ext.)													
bowl	—	—	—	1	—	—	—	—	—	—	—	—	1
crock	—	—	—	1	—	—	—	—	—	—	—	—	1
hollowware	—	—	—	3	—	—	—	—	—	—	—	—	3
Slip Glazed (int.)/Unglazed (ext.)													
hollowware	—	—	—	1	—	—	—	—	—	—	—	—	1
GLASS													
Molded													
Lipping tooled & cup-bottom molded													
clear blue													
bottle	—	—	—	1	—	—	—	—	—	—	—	—	1
Unidentified Manufacturing Technique													
clear green													
unidentified	—	—	—	1	—	—	—	—	—	—	—	—	1
METAL													
Ferrous													
Unidentified	—	—	—	1	—	—	—	—	—	—	—	—	1
DAUB	—	—	—	1	—	—	—	—	—	—	—	—	1
FAUNA													
Bone													
unworked													
alligator long bone	—	—	—	1	—	—	—	—	—	—	—	—	1
pig vertebra	—	1	—	—	—	—	—	—	—	—	—	—	1
sawn													
pig vertebra	—	—	—	—	—	—	—	—	—	—	1	—	1

(continued)

Table 6-1. Concluded.

	16TR12	16TR13	16TR14	16TR15	16TR18	HNC-1	HNC-2	HNC-3	HNC-4	HNC-5	HNC-6	HNC-7	
	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	TOTAL
POTTERY													
Anna Incised													
var. unspecified													
bowl	—	—	—	2	—	—	—	—	—	—	—	—	**2**
Baytown Plain													
var. Addis													
unidentified	1	—	—	—	—	—	—	—	—	—	—	1	**2**
var. unspecified													
bowl	—	1	—	3	—	—	—	—	—	—	—	—	**4**
jar	—	—	—	6	—	—	—	—	—	—	—	—	**6**
unidentified	—	28	1	53	1	4	3	6	3	2	—	1	**102**
Coles Creek Incised													
var. Hardy													
bowl	—	—	—	1	—	—	—	—	—	—	—	—	**1**
unidentified	—	1	—	1	—	—	—	—	—	—	—	—	**2**
var. unspecified													
unidentified	—	—	—	—	1	—	—	—	—	—	—	—	**1**
Mazique Incised													
var. Manchac													
jar	—	—	—	1	—	—	—	—	—	—	—	—	**1**
unidentified	—	—	—	2	—	—	—	—	—	—	—	—	**2**
var. unspecified													
unidentified	—	—	—	1	—	—	—	—	—	—	—	—	**1**
Mississippi Plain													
var. Yazoo													
unidentified	—	—	—	3	—	—	—	—	—	—	—	—	**3**
Mound Place Incised													
var. unspecified													
(on Baytown Paste)													
jar	—	—	—	—	—	—	—	—	—	—	—	1	**1**
unidentified	—	1	—	1	—	—	—	—	—	—	—	—	**2**
Unclassified Engraved													
on Baytown Paste													
unidentified	—	—	—	1	—	—	—	—	—	—	—	—	**1**
Unclassified Incised													
on Baytown Paste													
bowl	—	—	—	1	—	—	—	—	—	—	—	1	**2**
jar	—	—	—	2	—	—	—	—	—	—	—	—	**2**
unidentified	—	—	—	2	—	—	—	—	—	—	—	—	**2**
TOTAL	**1**	**32**	**1**	**101**	**2**	**4**	**3**	**6**	**3**	**2**	**1**	**4**	**160**

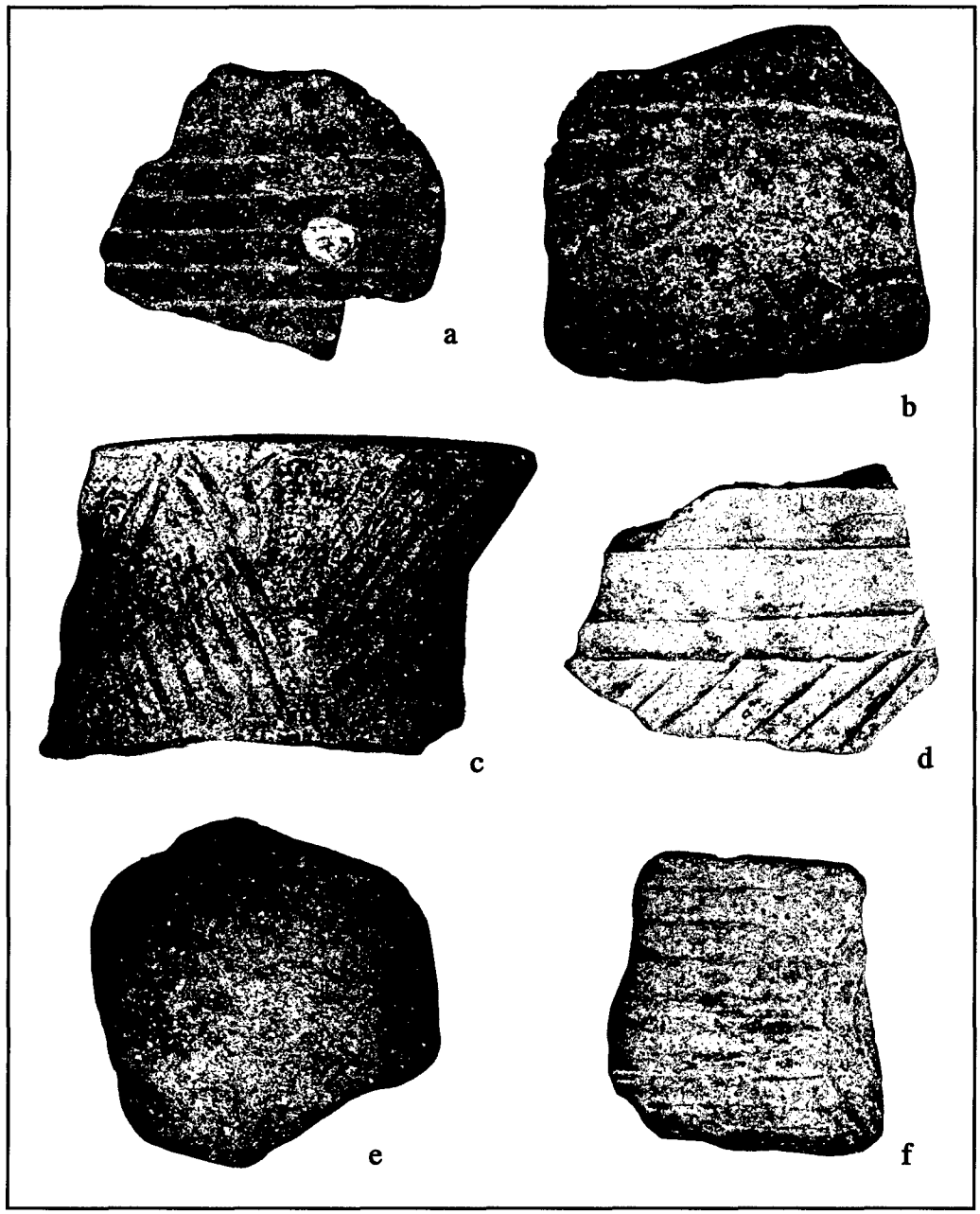


Figure 6-4. Aboriginal ceramics from 16TR13, 16TR15 and HNC-7. a) Coles Creek Incised, *var. Hardy* from 16TR13; b) Mound Place Incised on Baytown Paste from 16TR13; c-d) Mazique Incised, *var. Manchac* from 16TR15; e) Mound Place Incised on Baytown Paste from 16TR15; f) Mound Place Incised on Baytown Paste from HNC-7. Shown actual size.

a school, one historic district, and 12 homes. All are located in cities and towns, principally Houma (n=10), Schriever (n=4), Thibodaux (n=1) Gibson (n=1) and Montegut (n=1). One of the twelve homes is Robert Ruffin Barrow's Residence Plantation. Barrow also owned Crescent Plantation on Bayou Black in the project area.

A review of the standing structure files at the State of Louisiana Division of Historic Preservation revealed no recorded standing structures actually within the footprint of the proposed construction. However, six structures have been recorded in proximity to the HNC— two on Bayou du Large (55-888 and 55-889) and four on Bayou Grand Caillou

Figure 6-5. Site 16TR14 adjacent to the project area. View to the northeast. Date: 10/23/03.

Figure 6-6. Site 16TR15 adjacent to the project area. View to the southeast. Date: 10/23/03.

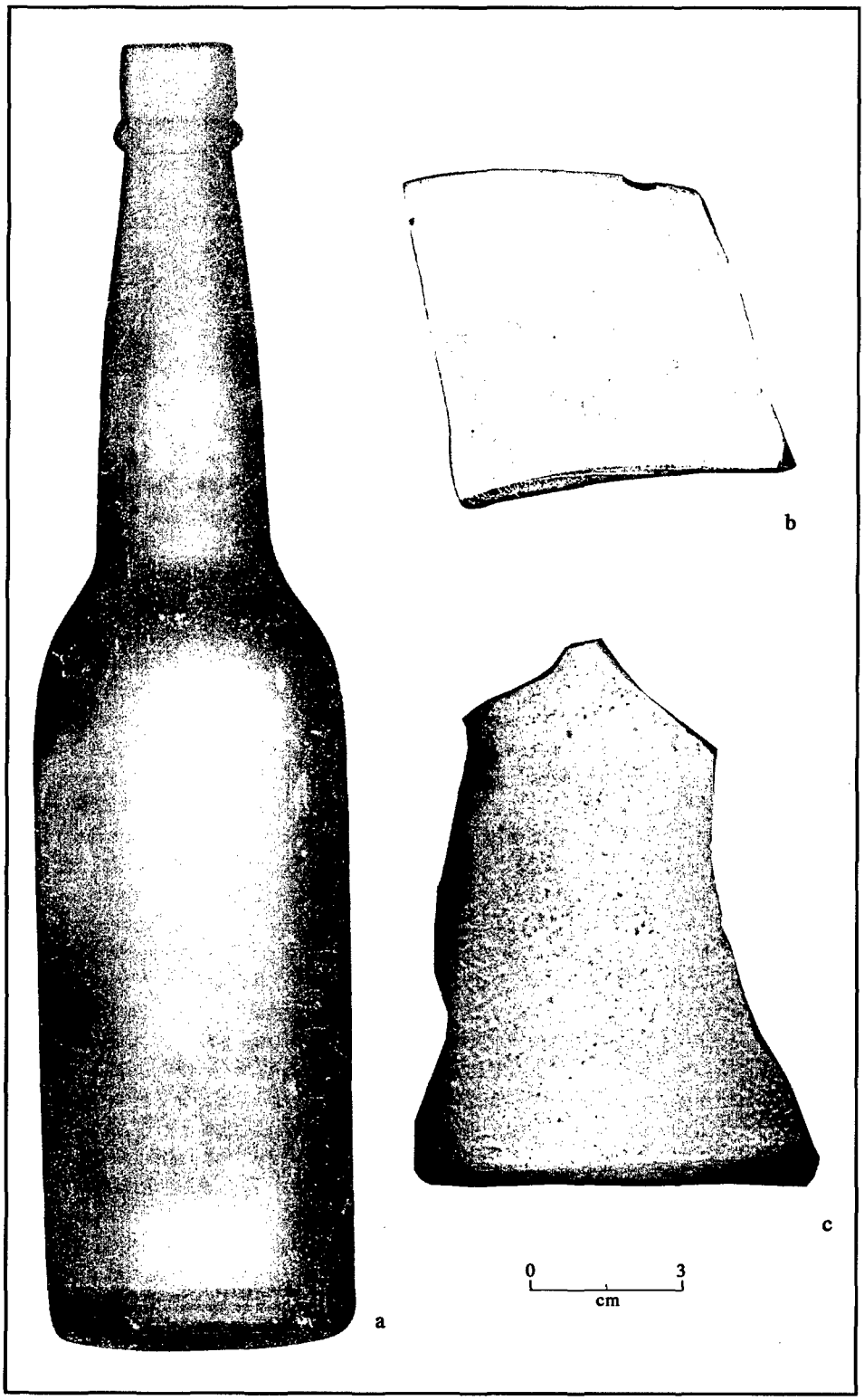


Figure 6-7. Historic artifacts from 16TR15. a) Cup-bottom molded and lipping-tooled clear blue bottle with a crown finish produced by the Adolphus Bush Glass Manufacturing Co. between 1886 and 1928; b) Ironstone plate rim; c) Salt-glazed exterior and slip-glazed interior stoneware crock.

Figure 6-8. Site 16TR18 within the project area. View to the north. Date: 10/23/03.

Figure 6-9. Site 16TR72 within the project area. View to the northeast. Date: 10/23/03.

Table 6-2. Standing Structures Listed on the National Register of Historic Places in Terrebonne Parish.

NAME	OTHER NAME	CITY	LISTED ON NRHP
Ardoyne Plantation House		Houma	November 1, 1982
Argyle		Houma	July 1, 1994
Armitage		Schriever	April 12, 1984
Clifford Percival Smith House	Walker House	Houma	April 20, 1989
Ducros Plantation House		Thibodaux	November 7, 1984
Gibson Methodist Episcopal Church	Gibson United Methodist Church	Gibson	May 8, 1986
Herman Albert Cook House		Houma	February 24, 1995
Houma Historic District		Houma	December 8, 1983
Magnolia		Schriever	August 4, 1983
Montegut School	Montegut Elementary School	Montegut	October 7, 1983
Orange Grove Plantation House		Houma	March 26, 1980
Polmer Store		Schriever	May 30, 1996
Residence Plantation House		Houma	September 8, 2001
Southdown Plantation House		Houma	January 18, 1974
St. George Plantation House		Schriever	October 5, 1982
St Mathew's Episcopal Church		Houma	May 1, 1989
Wesley House		Houma	August 11, 1982

(55-939 through 55-941 and 55-944). All six are residences recorded by Paul Leslie in May 1981 (see Figure 6-1).

Structures 55-888 and 55-889, the Dover and the Davis houses, are both located on the west bank of Bayou du Large near Crozier. The former is a small, Creole T-plan cottage built around 1900. The Davis house is a Creole L-plan cottage built in circa 1880.

Structures 55-939 through 55-941 are along Bayou Grand Caillou south of Bayou Pelton. Structure 55-939 is a cottage built around 1880, and the Le Blanc House, 55-940, a shotgun structure constructed in circa 1912. These two homes are located on the east bank of Grand Caillou, while 55-941 lies on the west bank. The latter building is a hip-roofed cottage dating from about 1915.

The Bourg House, 55-944, is located on the east bank of Grand Caillou near Dulac and just north of the Falgout Canal. This building is a concrete shotgun house with a Queen Anne style colonnaded porch surrounding two-thirds of the exterior. It was constructed in about 1912.

Shipwrecks

The earliest recorded shipwrecks near the project area appear in documents beginning in 1830s. However, vessels were traveling the area at an earlier date and earlier, unreported losses must be considered to have occurred. The latest recorded shipwrecks appear during World War II and the activities related to German U-boats. Most of these, while near the project vicinity, are located in the offshore Gulf of Mexico in deeper waters. Table 6-3 lists wrecks reported in the vicinity of the project area, derived from information presented in Coastal Environments, Inc. (1977). All wrecks occurring along bayous cut by the HNC are included as their exact locations cannot be pinpointed. However, the likelihood that a significant number of these wrecks occurred at the exact points where the HNC crosses the natural bayous is relatively low.

Yet the historical record of shipwreck losses cannot be used as the only measure of the shipwreck potential of a waterway, and, in fact, it will often be a very unreliable measure of that potential. Pearson et al. (1989:277-279) have noted that the historical record tends to be very biased toward recording losses

Table 6-3. Known Shipwrecks in the Vicinity of the Houma Navigation Canal (after Coastal Environments, Inc. 1977).

WRECK NUMBER	BOAT NAME	DATE LOST	LOSS CAUSE	WATERBODY	COMMUNITY	VESSEL TYPE	PUBLISHED REFERENCE	DATE RECORDED	REMARKS
1564	UNKNOWN	0/0/1986	UNKNOWN	BAYOU COCODRIE	LAKE BARRE	F/V	USCG, 1986	6/10/1987	USCG FILE #048-86
9	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	UNKNOWN	DER	USCGS, 1934 - LAKE QUITMAN	10/29/1986	
110	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #29	2/26/1987	VESSEL PAINTED WHITE WITH RED AND GREEN TRIM; PARTIALLY SALVAGED
246	SEVEN C	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #3	5/22/1987	VESSEL PAINTED WHITE WITH BLACK TRIM AND A RED BOTTOM; PARTIALLY SALVAGED
262	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #23	2/26/1987	VESSEL PARTIALLY SALVAGED
337	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #19	2/26/1987	VESSEL PAINTED WHITE WITH AQUA BLUE-GREEN & RED TRIM; PARTIALLY SALVAGED
514	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #2	2/26/1987	VESSEL PAINTED WHITE WITH BLUE TRIM; PARTIALLY SALVAGED
682	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #18	2/26/1987	VESSEL PAINED WHITE WITH BLUE TRIM; PARTIALLY SALVAGED
1138	BARBARA MAY	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #25	2/17/1987	VESSEL PAINTED WHITE WITH RED RIGGING; PARTIALLY SALVAGED
1139	SONNY BOY	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #2	5/22/1987	VESSEL PAINTED WHITE WITH RED AND BLUE TRIM; PARTIALLY SALVAGED; E.H. MARTHIS OWNER
1145	BIGTIMER	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #61	2/17/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1164	CHERAMIE BROS	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #5	2/17/1987	VESSEL PAINTED WHITE WITH YELLOW TRIM; PARTIALLY SALVAGED; LONZO BONVILLIAN, OWNER
1169	DOLLY K.	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #1	2/17/1987	VESSEL PAINTED WHITE WITH BLUE & GREEN TRIM AND A RED BOTTOM; PARTIALLY SALVAGED
1172	EVA MARIE	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #28	2/17/1987	VESSEL PAINTED WHITE WITH BLUE-GREEN RIGGING; PARTIALLY SALVAGED
1184	GRAND CAILLOU	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #53	2/17/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1190	JEP II	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #65	2/18/1987	VESSEL PAINTED WHITE WITH BLACK TRIM; PARTIALLY SALVAGED
1193	KENNY H	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	TUG	FLAYHARTY, 1983; USACE #21	2/18/1987	VESSEL PAINTED WHITE WITH GREEN TRIM; PARTIALLY SALVAGED; PAUL BUSINELLE, OWNER
1194	LA36AP	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #32	2/18/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1195	LA449VM	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #31	2/18/1987	VESSEL PAINTED WHITE WITH RED TRIM AND AQUA BLUE DECK; PARTIALLY SALVAGED
1196	LA663VD	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #47	2/18/1987	VESSEL PAINTED WHITE WITH LIGHT BLUE TRIM; PARTIALLY SALVAGED
1197	LA8LCY	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #6	2/18/1987	VESSEL PAINTED WHITE WITH BLACK TRIM AND BLACK RIGGING; PARTIALLY SALVAGED

(continued)

Table 6-3. Continued.

WRECK NUMBER	BOAT NAME	DATE LOST	LOSS CAUSE	WATERBODY	COMMUNITY	VESSEL TYPE	PUBLISHED REFERENCE	DATE RECORDED	REMARKS
1205	MARY LEE (LA234CU)	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #20	2/18/1987	VESSEL PAINTED WHITE W/AQUA TRIM AND GREEN RIGGING; PARTIALLY SALVAGED; ROBERT S.
1209	MISSY JENNIE LA222BG	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #43	2/18/1987	VESSEL PAINTED WHITE WITH BLUE AND GREEN TRIM; PARTIALLY SALVAGED
1242	RYLA617MJ	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #41	2/20/1987	VESSEL PAINTED WHITE WITH RED AND AQUA TRIM; PARTIALLY SALVAGED
1264	TRAWLER LA206BE	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #44	2/20/1987	VESSEL PAINTED WHITE WITH AQUA GREEN TRIM; PARTIALLY SALVAGED
1286	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #7	2/20/1987	POSSIBLE BARGE HULL WITH STEEL FRAME & STEEL CROSS MEMBERS REMAINING, FULL OF WATER
1287	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #8	2/23/1987	VESSEL PAINTED WHITE WITH RED TRIM AND A LIGHT BLUE DECK; PARTIALLY SALVAGED
1288	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #9	2/23/1987	VESSEL PAINTED WHITE WITH GREEN TRIM; PARTIALLY SALVAGED
1289	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #10	2/23/1987	VESSEL PAINTED WHITE WITH AQUA BLUE TRIM; PARTIALLY SALVAGED
1290	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #11	2/23/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1291	UNKNOWN	UNKNOWN	BURNED	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #12	2/23/1987	PARTIALLY SALVAGED; PIECE OF THE BOW ONLY REMAINS
1292	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #13	2/23/1987	USACE REPORTS LENGTH AS 30-35'; VESSEL PAINTED WHITE; PARTIALLY SALVAGED; PILOT
1293	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #15	2/23/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1294	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	BGE	FLAYHARTY, 1983; USACE #16	2/23/1987	WORK BARGE WITH STEEL FRAME AND STEEL BAR STRUCTURES FOR WOOD COVER (?) REMAINING
1295	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #17	2/23/1987	VESSEL PAINTED WHITE WITH AQUA GREEN TRIM; PARTIALLY SALVAGED
1297	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #33	2/26/1987	VESSEL PAINTED WHITE WITH GREEN TRIM; PARTIALLY SALVAGED
1298	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #34	2/26/1987	PARTIALLY SALVAGED
1299	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #35	2/26/1987	MAST PAINTED BLUE AND WHITE; PARTIALLY SALVAGED
1300	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #36	2/26/1987	VESSEL PAINTED WHITE WITH AQUA AND RED TRIM; PARTIALLY SALVAGED
1301	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #37	2/26/1987	VESSEL PAINTED WHITE WITH BLUE AND RED TRIM; PARTIALLY SALVAGED
1302	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #38	2/26/1987	VESSEL PAINTED WHITE WITH DARK BLUE AND DARK BROWN TRIM; PARTIALLY SALVAGED
1303	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #39	2/26/1987	VESSEL PAINTED WHITE WITH AQUA AND RED TRIM; PARTIALLY SALVAGED
1304	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #40	2/26/1987	VESSEL PAINTED WHITE WITH AQUA TRIM; PARTIALLY SALVAGED

(continued)

Table 6-3. Continued.

WRECK NUMBER	BOAT NAME	DATE LOST	LOSS CAUSE	WATERBODY	COMMUNITY	VESSEL TYPE	PUBLISHED REFERENCE	DATE RECORDED	REMARKS
1305	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #42	2/26/1987	VESSEL PAINTED WHITE WITH AQUA BLUE TRIM; PARTIALLY SALVAGED
1306	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	BGE	FLAYHARTY, 1983; USACE #45	2/26/1987	PARTIALLY SALVAGED
1307	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #46	2/26/1987	VESSEL PAINTED WHITE WITH RED, GREEN AND ORANGE TRIM; PARTIALLY SALVAGED
1308	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #48	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1309	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #49	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1310	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #50	2/26/1987	PARTIALLY SALVAGED
1311	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #51	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1312	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #52	2/26/1987	PARTIALLY SALVAGED
1313	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #54	2/26/1987	PARTIALLY SALVAGED
1314	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #55	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1315	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #56	2/26/1987	PARTIALLY SALVAGED
1316	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #57	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1317	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #58	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1318	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #59	2/26/1987	PARTIALLY SALVAGED
1319	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #60	2/26/1987	PARTIALLY SALVAGED
1320	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #62	2/26/1987	PARTIALLY SALVAGED
1321	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #63	2/26/1987	PARTIALLY SALVAGED; VESSEL BOTTOM AND ENGINE ONLY REMAINING PARTS
1322	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #64	2/26/1987	PARTIALLY SALVAGED; VESSEL BOTTOM ONLY REMAINING PART
1323	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #66	2/26/1987	VESSEL PAINTED WHITE WITH RED AND YELLOW TRIM; PARTIALLY SALVAGED
1324	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #67	2/26/1987	VESSEL PAINTED WHITE; PARTIALLY SALVAGED
1325	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #68	2/26/1987	PARTIALLY SALVAGED
1326	UNKNOWN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #69	2/26/1987	VESSEL PAINTED BLUE AND WHITE; PARTIALLY SALVAGED
1529	COMPASS ROSE	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #4	5/22/1987	PAINTED WHITE W/BLACK & AQUA BLUE TRIM & BLACK RIGGING; PARTIALLY SALVAGED

(continued)

Table 6-3. Concluded.

WRECK NUMBER	BOAT NAME	DATE LOST	LOSS CAUSE	WATERBODY	COMMUNITY	VESSEL TYPE	PUBLISHED REFERENCE	DATE RECORDED	REMARKS
1530	CAPTAIN NOONIE	UNKNOWN	BURNED	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #14	5/22/1987	VESSEL PAINTED WHITE W/AQUA & RED TRIM & ORANGE RIGGING; PARTIALLY SALVAGED
1531	CAPT JOHN B	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #22	5/22/1987	VESSEL PAINTED WHITE WITH AQUA & RED TRIM; PARTIALLY SALVAGED; JOSEPH VARNIS PAR
1532	CAPT RIC	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #26	5/22/1987	VESSEL PAINTED WHITE WITH GREEN TRIM; PARTIALLY SALVAGED; ANDY A. BLANCHARD, OWNER
1533	PELICAN	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #27	5/22/1987	VESSEL PAINTED WHITE WITH AQUA TRIM; PARTIALLY SALVAGED; ANDREW KWASNY, OWNER
1534	MARY L	UNKNOWN	UNKNOWN	BAYOU GRAND CAILLOU	DULAC	UNKNOWN	FLAYHARTY, 1983; USACE #30	5/22/1987	VESSEL PAINTED WHITE WITH RED & GREEN TRIM; PARTIALLY SALVAGED; ROBERT B. LINER,OWNER
1591	LA 786 XF	0/0/1982	UNKNOWN	BAYOU GRAND CAILLOU	BAYOU PLAT	UNKNOWN	USCG, 1986	6/10/1987	USCG FILE #104-82
1579	UNKNOWN	0/0/1979	UNKNOWN	GIWW	HOUMA	P/C	USCG, 1986	6/10/1987	USCG FILE #128-79
1050	UNKNOWN	8/18/1779	SANK IN STORM	GULF OF MEXICO	ISLES DERNIERES	GLN	CEI #208; MARX, 1971	1/28/1987	BERNARDO DE GALVEZ FLEET; CARRYING $300,000 IN GOLD & SILVER
1056	LIZZIE HAAS	12/11/1902	FOUNDERED	GULF OF MEXICO	WINE ISLAND	UNKNOWN	WPA WRECK REPORT	1/29/1987	FOUNDERED IN A HEAVY GALE ABOUT 10 MILES FROM THE MAINLAND; DRAGGED ANCHORS
1090	NAUTILUS	8/10/1856	STRANDED & SWAMPED	GULF OF MEXICO	LAST ISLAND	ST	CEI #1106, 1107; LYTLE, 1975	2/5/1987	ISLES DERNIERES; 20 KILLED
1091	STAR	8/10/1856	STRANDED & SWAMPED	GULF OF MEXICO	LAST ISLAND	SSW	BERMAN, 1972; CEI #1255; LYTLE, 1975	2/5/1987	ISLES DERNIERES
1092	TRINITY	11/26/1851	STRANDED & SWAMPED	GULF OF MEXICO	LAST ISLAND	SSW	BERMAN, 1972; CEI #1294; LYTLE, 1975	2/4/1987	ISLES DERNIERES
1093	MINNIE	8/19/1888	UNKNOWN	GULF OF MEXICO	SHIP SHOAL	SCH	BERMAN, 1972; CEI #1074	2/5/1987	
1094	THISTLE	10/25/1877	STRANDED & SWAMPED	GULF OF MEXICO	TIMBALIER ISL.	UNKNOWN	CEI #1283; WPA WRECK REPORT	2/5/1987	STRANDED, RUN ASHORE AT THE WEST END OF TIMBALIER ISLAND
1057	JERRY	5/10/1909	FOUNDERED	GULF OF MEXICO*	TIMBALIER ISL.	UNKNOWN	CEI #1582; WPA WRECK REPORT	1/29/1987	14 MILES OFF TIMBALIER ISLAND; TOOK ON WATER FROM LOOSE BOTTOM PLANK
1565	CINOS	0/0/1986	UNKNOWN	LITTLE COCODRIE BAYOU	LAKE BARRE	F/V	USCG, 1986	6/10/1987	USCG FILE #205-86
15	UNKNOWN	UNKNOWN	UNKNOWN	TERREBONNE BAY	TIMBALIER ISL.	UNKNOWN	USCGS, 1938 - TIMBALIER AND TERREBONNE BAYS	11/4/1986	
211	MERCHANT	10/3/1842	STRANDED & SWAMPED	TIMBALIER BAY	WEST TIMBALIER	SSW	BERMAN, 1972; LYTLE, 1975	12/31/1986	OTHER POSSIBLE DATE OF LOSS 10/04/1842, TONNAGE 305, DATE BUILT 1835 (PER LYTLE)

* TERREBONNE/LAFOURCHE/JEFFERSON PARISH

only of large or important vessels. The losses of smaller craft such as those likely to have traveled the bayous in the project area, or vessels that have been abandoned tend to go unrecorded in the documentary record. In some cases, such as during navigation improvements, these previously unrecorded wrecks may get incorporated into the written historical record, particularly if they represent a navigation hazard. However, where these improvements have not been undertaken, or where they have not been documented, even these vessels will go unrecorded (Pearson and Saltus 1991:112).

Wrecks along the HNC proper and postdating 1962 are not included in Coastal Environments, Inc. 1977, but are sure to be common. Thirteen sunken or abandoned craft in the HNC that the U.S. Coast Guard considers navigation hazards appear in Table 6-4. Modern navigation charts depict several wrecks in the vicinity of Cat Island Pass, most of which are probably sunken shrimping or fishing boats. Although the HNC itself ranges from 41 to 46 years old, it is possible that vessels 50 years old or older have been lost in the canal since its opening in 1962.

Pearson et al. (1989) and Birchett and Pearson (1998) mention three vessels reported to have been lost in the near vicinity of Cat Island Pass, the southern extent of the HNC. These are the sidewheel steamer *Merchant*, built in Baltimore in 1835 and stranded on West Timbalier Island in 1842 (Lytle 1975:281); the schooner *Thistle*, built in 1864 and stranded on the west end of Timbalier Island in 1877 (WPA 1938:318) and the *Lizzie Haas*, also a schooner, which foundered in a heavy gale on Wine Island in 1902 (WPA 1938:210). These three boats can be considered somewhat representative of the types of watercraft used in the project area during the historic period.

The Sidewheel Steamer Merchant

The initial enrollment document for the sidewheel steamer *Merchant* was issued at the Port of Baltimore on May 18, 1835, apparently the date of her completion. The owners are listed as William G. Harrison and Gorham Brooks of Baltimore. She is listed as measuring 305 13/95 tons and having one deck, two masts and a square stern, no galleries, no figurehead with a length of 151 feet 8 inches, a breadth of 25 feet 6 inches and a depth of 8 feet 4 inches (Bureau of Marine Inspection and Navigation [hereafter cited BMIN] 1835). The *Merchant* left Baltimore for New Orleans not long after her construction, because by mid-1836 she was enrolled in the latter city and continued there under different owners for the remainder of her career. The fact that the *Merchant* was fitted with masts would suggest that she was built specifically for operation on the ocean, presumably as a coastal steamer. She is likely to have been built specifically to serve along the coast of the Gulf of Mexico, an area where maritime trade was increasing, particularly, with Texas after her independence from Mexico.

On July 1, 1836, the steamer was purchased by the Merchant Steamboat Company of New Orleans, John Kilshaw, Jr., President (BMIN 1836). Other owners, all residents of New Orleans, were Gregory Byrne in November 1837, Maunsel White and Gregory Byrne in November 1838, Robert Shaw in March 1839, and James Walter Breedlove in July 1839 (WPA 1942:III:144). The *Merchant* was reported stranded on West Timbalier Island on October 3 or 4, 1842, with a loss of 8 lives (Lytle 1975:281). Although reported stranded, no information has been found as to the final disposition of the vessel. The *Merchant* may have been recovered and refloated or she may have broken up. Efforts certainly would have been made to salvage the vessel if conditions permitted, but reports of these types of endeavors rarely find their way into the published record.

The Schooner Thistle

The *Thistle* was a schooner built in 1864 at Mobile, Alabama. Her first known enrollment document was issued at the Port of Mobile on October 1865, with Thomas D. Bell and James Taih listed as equal owners. The *Thistle* had one deck and two masts, a square stern, a cabin on deck and "plain bowhead." She measured 52 33/100 tons in burden and her length was 73 1/10 feet, her breath 21 2/10 feet and her depth 5 7/10 feet.(BMIN 1865). The *Thistle* seems to have been rather typical of the schooners built and used along the gulf coast during the nineteenth century. These shallow draft vessels were the most important carriers of cargo to and from many coastal communities prior to the coming of the steamboat. Even after the steamboat, coastal schooners remained active in certain trades down to the early years of the present century (Pearson et al. 1991). The *Thistle's* enrollment changed in 1866 when James Taih became sole owner (BMIN 1866). She was sold back to T.D. Bell with a new enrollment, dated December 27, 1871 (BMIN 1871). Another ownership change occurred on September 3, 1872, when Mrs.

Table 6-4. Shipwrecks in the Houma Navigation Canal Listed in the U.S. Coast Guard Database of Navigation Hazards (after U.S. Coast Guard 2000).

ID NUMBER	FILE NUMBER	VESSEL TYPE/NAME	STATUS	WATERBODY	REMARKS
333	008-89	DERELILCT BARGE	SUNK	HOUMA NAVIGATION CANAL	REF 166-88
349	009-77	BARGE T-12	SUNK	HOUMA NAVIGATION CANAL	
632	020-82	F/V UNKNOWN	SALVAGED	HOUMA NAVIGATION CANAL	3MI NORTH OF FALGOUT CANAL
839	029-83	F/V SUCCESS	SALVAGED	HOUMA NAVIGATION CANAL	JUST WEST OF LT 26
1159	043-86	LAFITTE SKIFF	SUNK	HOUMA NAVIGATION CANAL	COULD NOT BE LOCATED
2982	124-76	75FT BARGE	SUNK	HOUMA NAVIGATION CANAL	
3110	130-79	BARGE UNKNOWN	SUNK	HOUMA NAVIGATION CANAL	3 MI S OF THE HIGHWAY 661 BRIDGE
3148	132-79	BARGE UNKNOWN	SUNK	HOUMA NAVIGATION CANAL	5 MI S OF INTERSECTION WITH ICW
3789	166-88	125 FT DERELICT BARGE	SUNK	HOUMA NAVIGATION CANAL	NOT HAZARD
3892	172-91	LADY GLENIS	SALVAGED	HOUMA NAVIGATION CANAL	
5085	276-84	MR BILL CLARK	SALVAGED	HOUMA NAVIGATION CANAL	BLOCKING CHANNEL
5584	396-85	UNK BARGE	SUNK	HOUMA NAVIGATION CANAL	
6320	NOS115	TWO BARGES	SUNK	BAYOU PELTON	AT CROSSING OF HOUMA NAVIGATION CANAL

Jane F. Bell of Mobile became sole owner, possibly when T.D. Bell passed away (BMIN 1872).

In August 1874, Augustus Wakelee of Galveston, Texas, acquired the schooner and she was registered in that city (BMIN 1874:No. 32). In May 1875, Wakelee obtained a "*register*" rather than an enrollment document for the *Thistle* (BMIN 1875:No. 27). *Registers* were issued primarily for vessels involved in trade with foreign ports. It is most likely that the *Thistle* was sailing to Mexico or to the Caribbean. In 1875, Wakelee enrolled the *Thistle* in Galveston, placing her back into "Domestic Commerce." The description of the *Thistle* also changed to indicate that she now had a "round" stern, suggesting possible repairs or rebuild (BMIN 1875:No. 21). In 1876, C.J. Ranlett of Galveston acquired the schooner (BMIN 1876) and, on May 24, 1877, Edward L. Ranlett of New Orleans enrolled her in that city as the new owner. The master is listed as R. Whiting (BMIN 1877). Her master was an F.E. Castanzi of New Orleans on her passage from Pascagoula to Tabasco, Mexico, when she was stranded on the west end of Timbalier Island at 3 AM on October 25, 1877. The vessel had been run ashore in high winds and very heavy seas. She was listed as a total loss and valued at $25,000 (WPA 1938:318).

The Schooner Lizzie Haas

The *Lizzie Haas* was another locally built schooner, named after the owner, Mrs. Lizzie Haas of Madisonville, Louisiana. The *Lizzie Haas* was built in Madisonville, Louisiana, in 1882 and enrolled at the port of New Orleans on July 6, 1882, with John R. Haas as master. She was a fairly small vessel, with a burden of 26 62/100 tons, a length of 59 2/10 feet, a breath of 21 5/10 feet, and a depth of 4 3/10 feet. She had one deck and two masts with a plain head and a square stern (BMIN 1882). A new enrollment was issued on March 14, 1883, when ownership of the vessel changed to Juan Gener of New Orleans. There are a couple of interesting notes on the new enrollment. The tonnage capacity was reduced to 25 29/100 tons for deductions allowed under an Act of August 5, 1882. There was also a notation of $14.43 paid for the 5 officers and crew for "Hospital money" for the period since July 6, 1882 (BMIN 1883).

Another enrollment was issued April 28, 1892, listing a new owner and master, James C. Weaver of New Orleans (BMIN 1892). James Weaver made some changes to the *Lizzie Haas* that required a new enrollment on May 13, 1895. She now had a modeled bowhead and her tonnage increased to 34 9/100 tons, plus 2 2/100 tons for "head room" for enclosures on the upper deck. The gross tonnage of 36 11/100 was decreased to a net tonnage of 20 76/100 tons allowed for "Deductions under Section 4153, Revised Statues, as amended by Act of March 2, 1895." Her deductions included 6 10/100 for crew space, 6 73/100 for master's cabin, 1 63/100 for boatswain's stores and 89/100 for storage of sails (BMIN 1895). A new enrollment was issued for the schooner on March 16, 1899, for her owner and master, John Milloit of Madisonville (BMIN 1899). On a voyage on December 11, 1902, from Bayou Grand Caillou to New Orleans, she foundered in a heavy gale on Wine Island. She dragged her anchors, but was unable to save herself from sinking. She was a total lost, valued at $2,500 (WPA 1938:210).

New Cultural Resources Noted in the Project Area

When in the project area to examine previously recorded cultural resources, several new archaeological sites, standing structures, and shipwrecks were noted, visited and photographed. In addition, numerous localities along the banks of the HNC that exhibit shell were plotted on the project plans as potential sites, but not examined further (see Plates 1 to 5).

Archaeological Sites

Seven unrecorded archaeological sites were noted along the HNC during the course of these investigations (Figure 6-10 and Plates 1 to 5). HNC-1 was located on the east bank of the HNC opposite proposed dredge spoil Site 5 (Figure 6-10 and Plate 1). A heavy concentration of shell was noted along approximately 125 m of the bank where the HNC cuts across Bayou La Carpe (Figure 6-11). Mostly rangia shell with some oyster was also noted in the cutbank. Four sherds of Baytown Plain, *var. unspecified* were recovered from the site (see Table 6-1). Three other shell concentrations were noted opposite HNC-1, on the east bank of the HNC and in Site 5 (see Plate 1). All of these locales occur where the HNC has truncated a meander of Bayou La Carpe.

HNC-2 was located downstream of HNC-1 and also on the west bank of the canal, north of proposed dredge spoil Site 8 (see Figure 6-10 and Plate 1). Here again the HNC clips a meander of Bayou La Carpe near where it once intersected with Bayou

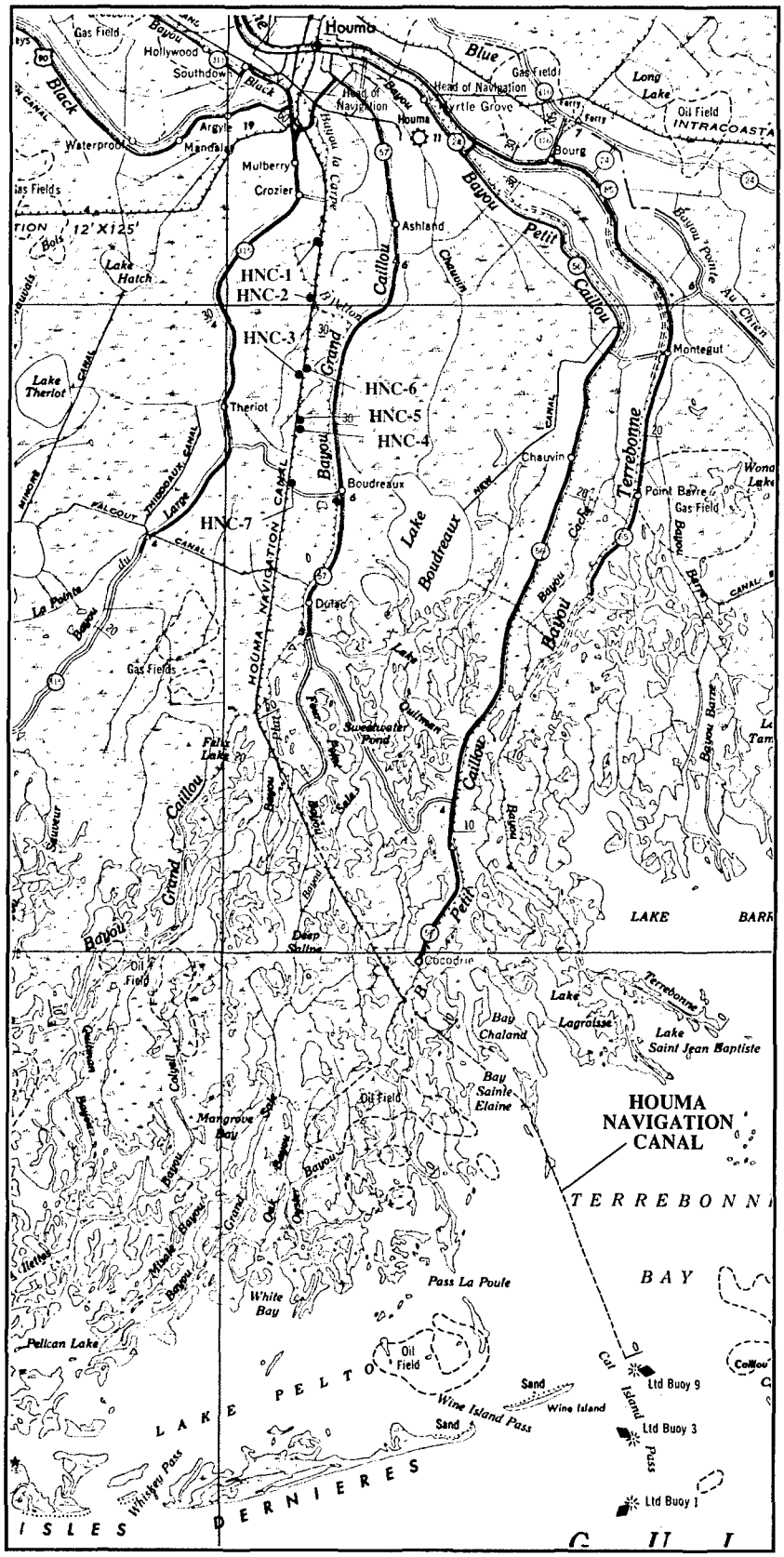


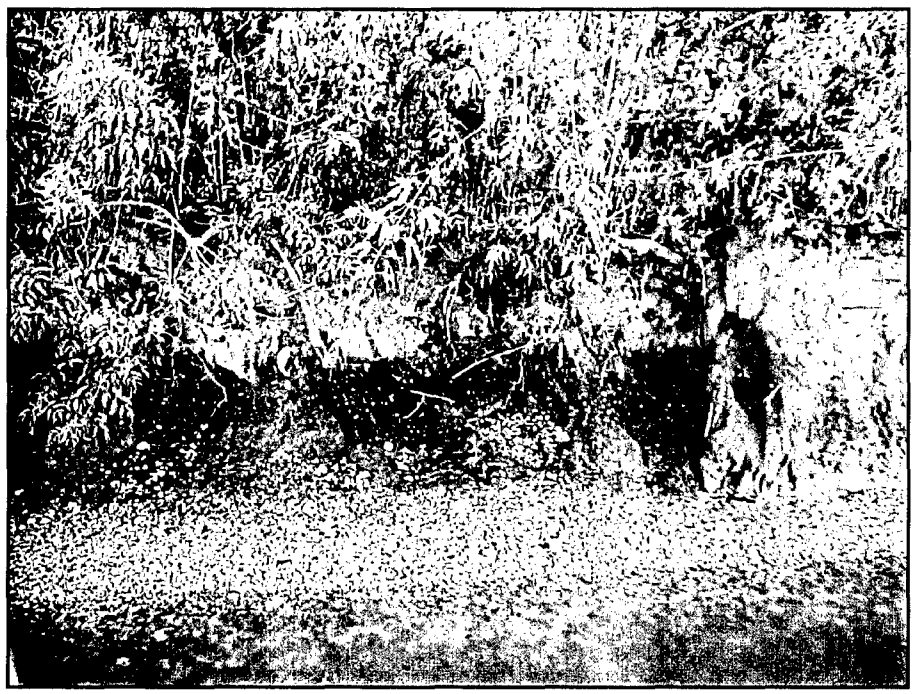
Figure 6-10. New archaeological sites within the project area.

Figure 6-11. HNC-1 on the west bank of the Houma Navigation Canal. View to the northwest. Date: 10/21/03.

Pelton. Shell, rangia and some oyster, was noted from the Bayou La Carpe intersection south to an excavated well slip (Figure 6-12). Shell was noted in the cutbank and as a wave-washed deposit at the base of the bank at HNC-2. Three sherds of Baytown Plain, *var. unspecified* were recovered from the wave-washed deposit (see Table 6-1).

Another patch of shell was also noted south of HNC-2 from the well slip down to where a pipeline

a



b

Figure 6-12. HNC-2 on the west bank of the Houma Navigation Canal. View to the southwest (a) and northwest (b). Date: 10/21/03.

crosses the HNC (see Plate 1). Opposite HNC-2, on the east bank of the HNC, two large oak trees in an undisturbed cypress swamp were noted along the proposed access route to dredge spoil Site 6A. Shell was also noted along the bank in this location, and three others to the south between Bayou Pelton and the pipeline (see Plate 1). All of these deposits occur where the HNC has cut across Bayous La Carpe and Pelton.

Proceeding south down the HNC, patches of shell were noted south of the intersection with 40 Acre

Bayou and dredge spoil Site 8 (see Plate 2). Two lie on the west bank and the third immediately opposite them on the east bank. All occur where the HNC crosses Bayou Boeuf.

Two new sites were located down the canal in and opposite proposed dredge spoil Site 9—HNC-3 on the west bank and HNC-6 on the east bank (see Figure 6-10 and Plate 2). Both sites occur south of a second pipeline crossing, where the HNC cuts across another branch of Bayou Boeuf. At HNC-3, rangia and some oyster shell was noted on the bank extending from the pipeline crossing south to the intersection with Bayou Boeuf (Figure 6-13). Large oak tress and palmetto were noted in an undisturbed cypress swamp at this location. Shell was also recorded at the pipeline crossing to the north of the HNC-3, but this appears to have been dumped there to prevent bankline erosion. Although little shell was noted in the cutbank at HNC-3, six sherds of Baytown Plain, *var. unspecified* were recovered from the site (see Table 6-1).

George Castille of CEI visited HNC-3 on February 28, 2000 while in the course of another field project. His collection of surface artifacts from the site was analyzed by Doug Wells, also of CEI, and subsequently returned to the property owner (George Castille, personal communication 2003). The assemblage included: a Plaquemine Brushed, *var. Plaquemine* rim sherd; one Rhinehart Punctated, *var. unspecified* rim; a Mazique Incised, *var. Manchac* rim; a body sherd of Coles Creek Incised, *var. Hardy*; one Mississippi Plain, *var. unspecified* body sherd; five Baytown Plain, *var. Addis* body sherds; three unidentified rim sherds; and 18 unidentified body sherds. Wells estimated the date of the assemblage to be A.D. 1200 to 1350, therefore encompassing Plaquemine culture and the early Mississippi Period.

Site HNC-6 lies at the northwestern corner of dredge spoil Site 9, opposite HNC-3 and immediately south of the pipeline crossing (see Figure 6-10 and Plate 2). A thin lens of small rangia and some oyster shell was noted in the bankline at this site (Figure 6-14). Shell was also abundant on the bank and as a wave-washed deposit at its base. The only artifact collected from the site is the sawn vertebra of an immature pig (see Table 6-1).

Sites HNC-4 and HNC-5 lie on the east bank of the canal where it again crosses Bayou Boeuf (see Figure 6-10 and Plate 2). HNC-4 is located in dredge spoil Site 10 and HNC-5 in Site 9. The artificial slip that separates the two sites is the proposed access route to dredge spoil Sites 9B and 10B. Redeposited midden is clearly evident at both sites and probably represents spoil from the slip excavation (Figures 6-15 and 6-16). It is probable that HNC-4 and HNC-5 represent the northern and southern edges of the single site disturbed by the slip excavation. Three sherds of Baytown Plain, *var. unspecified* were found at HNC-4 and two others at HNC-5 (see Table 6-1).

At the southern end of dredge disposal Site 10 and opposite dredge spoil Site 13A, rangia shell was noted along the east bank of the HNC (see Plate 2). This deposit also seems to be associated with a branch of Bayou Boeuf, the remnants of which are evident in dredge spoil Site 13A. Shell deposits were also mapped on both banks of the HNC, north and south of Bayou Provost (see Plate 2). On the west bank one deposit is immediately adjacent to dredge spoil Site 13B, while another is within dredge spoil Site 12A. On the east bank one deposit is bisected by the proposed access route to dredge spoil Site 13 and the other by the access route to dredge spoil Site 12.

HNC-7 lies on the east bank of the HNC where it intersects Bayou Guilliame (see Figure 6-10 and Plate 2). Cypress trees and a telephone pole occur on the site, and a large pile of trash has been dumped to its immediate north (Figure 6-17). While the west bank of the Bayou Guilliame intersection has been buried by riprap, the stumps of dead trees of a former cypress swamp and two shell deposits are evident along the canal bank immediately north of the riprap (see Plate 2). Site HNC-7 contains rangia, plus some oyster shell, and produced a sherd each of Baytown Plain, *vars. Addis* and *unspecified*; Unclassified Incised on Baytown Paste; and Mound Place Incised on Baytown Paste (see Table 6-1 and Figure 6-4). Another shell deposit was recorded south of HNC-7 and the road parallel to Bayou Guilliame (see Plate 2).

Proceeding south down the HNC, shell was noted on the east bank of the canal beginning north of Existing Disposal Area E14 and extending to approximately 300 m north of the artificial slip bisecting Existing Disposal Area E14 (see Plate 3). Much of the west bank in this area has been buried by rip rap; however, cypress stumps and shell are evident beginning immediately south of the rip rap and extending to just beyond the artificial slip on the opposite bank of the HNC (see Plate 3). These large

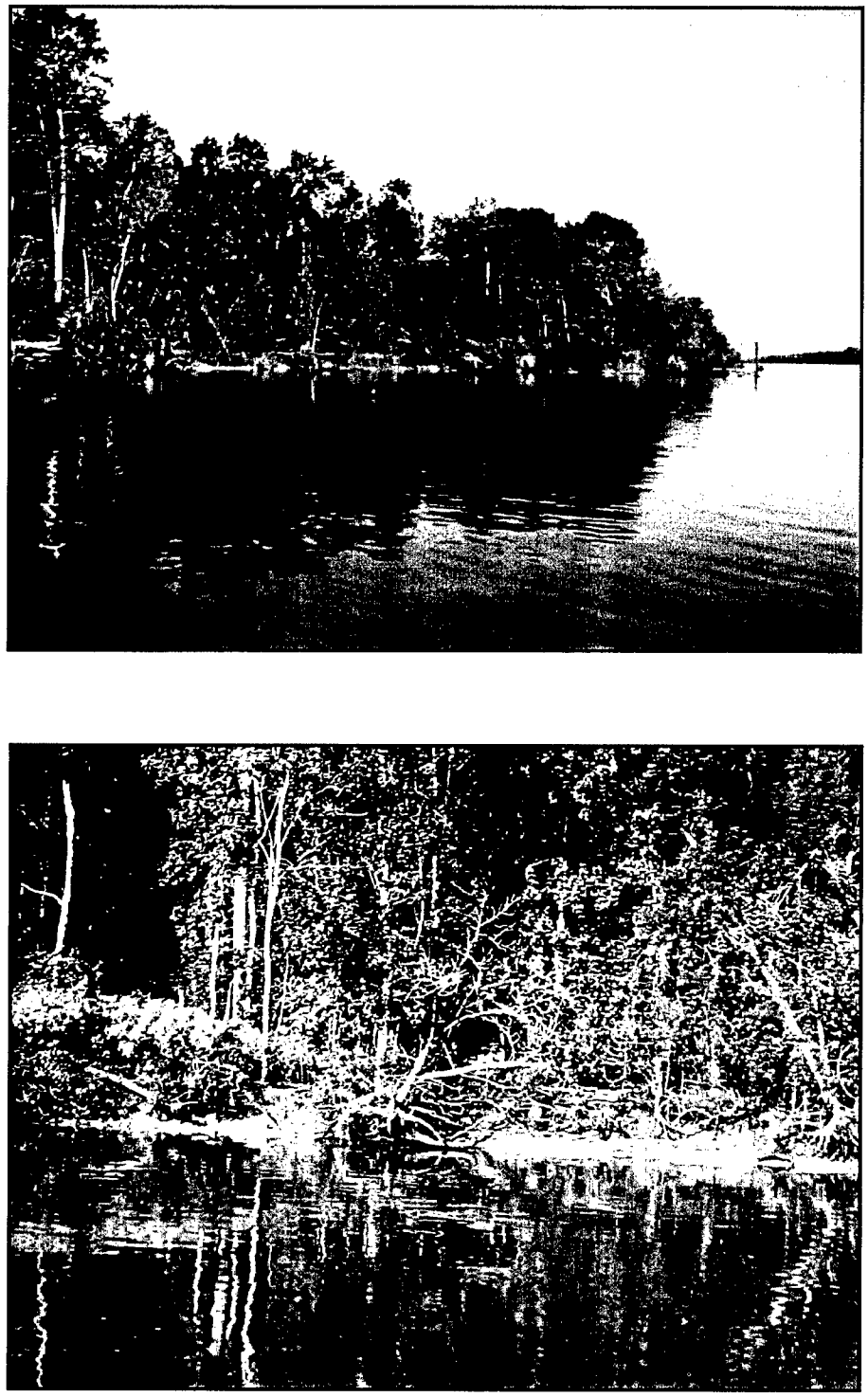
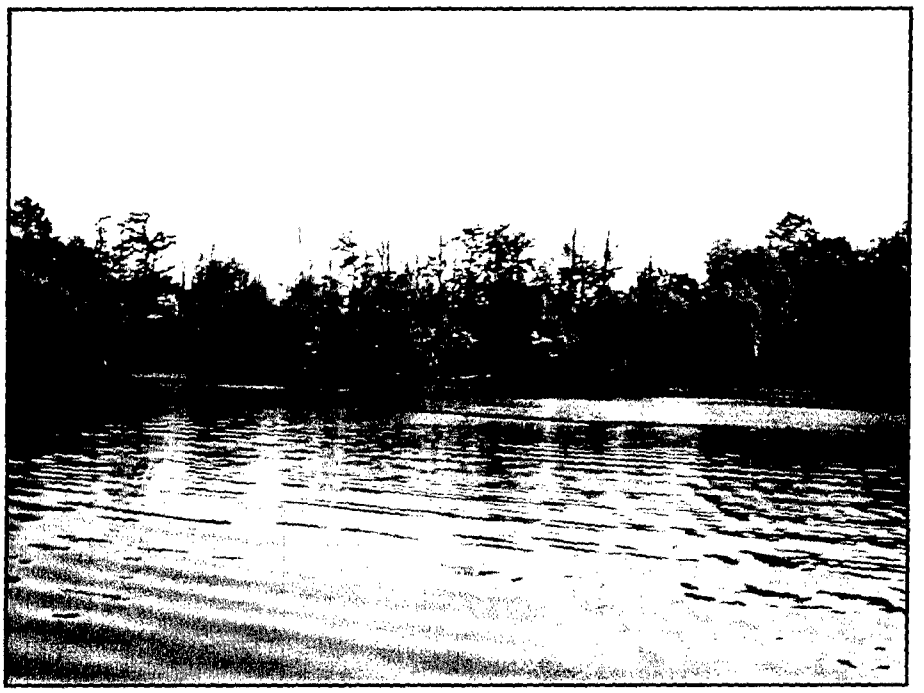


Figure 6-13. HNC-3 on the west bank of the Houma Navigation Canal. View to the northwest. Date: 10/22/03.



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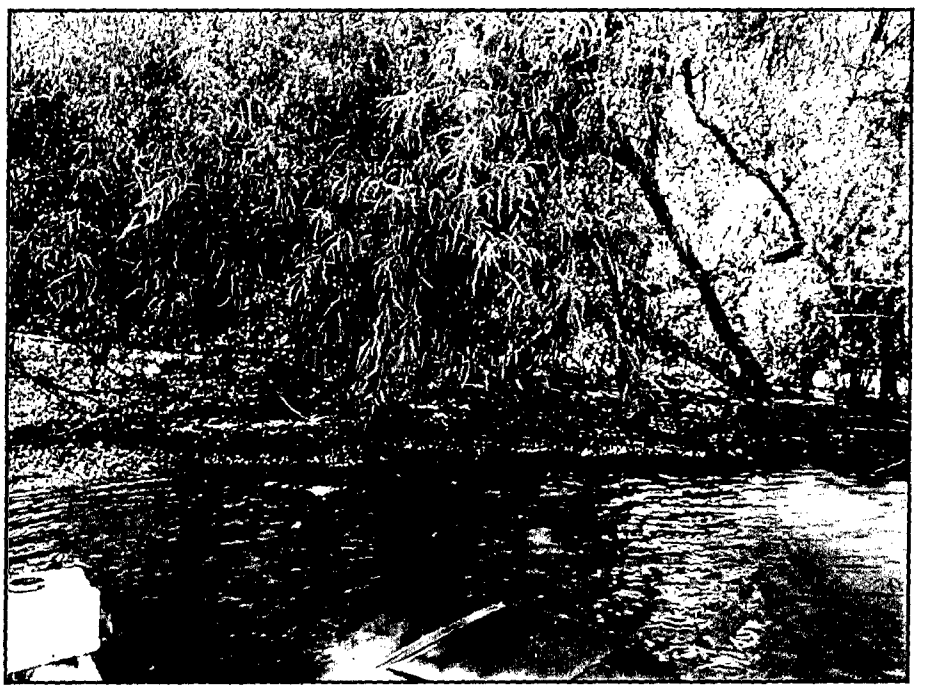

b

Figure 6-14. HNC-6 on the east bank of the Houma Navigation Canal. View to the northeast (a) and southeast (b). Date: 10/22/03.

Figure 6-15. HNC-4 on the east bank of the Houma Navigation Canal. View to the northwest. Date: 10/22/03.

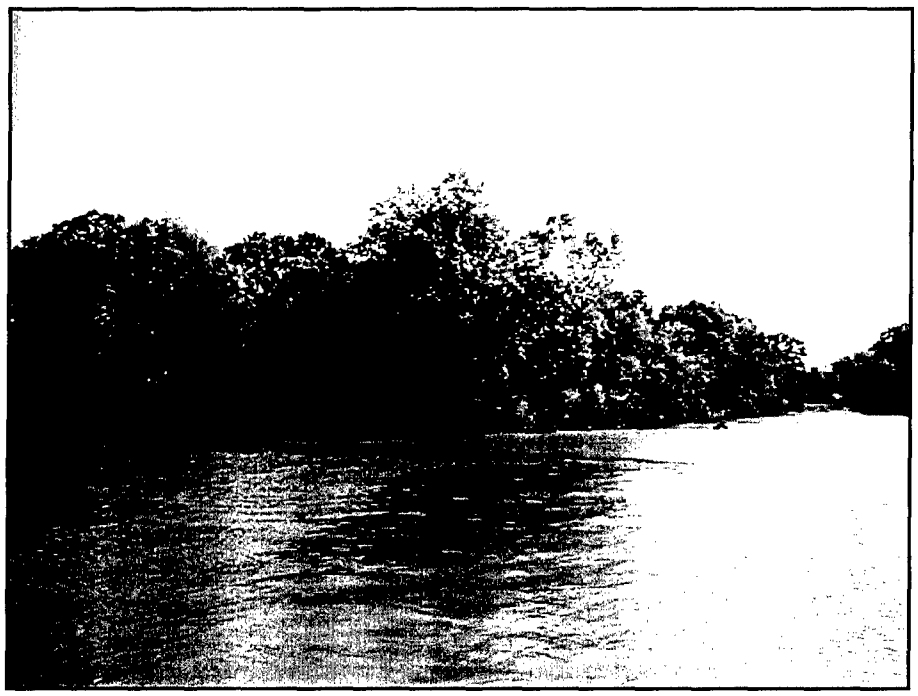

Figure 6-16. HNC-5 on the east bank of the Houma Navigation Canal. View to the northeast. Date: 10/22/03.

shell deposits appear to be associated with occupations located on a former crevasse of Bayou Grand Caillou.

Two additional shell deposits were noted where the HNC intersects with the Falgout Canal (see Plate 3). These both occur in Existing Disposal Area E15C. Although the banklines of the HNC were not examined in such detail south of the Dulac pontoon bridge, additional shell deposits are bound to exist in this southern portion of the project area as well.

Standing Structures

The only standing structures noted in the project area during this preliminary investigation are: the Dulac pontoon bridge; a wooden shed and abandoned wooden dock on the east bank of the HNC just south of Bayou Guilliame; and three metal storage tanks in Existing Disposal Area Site E14 on either side of the old crevasse channel of Bayou Grand Caillou (see Plates 2 to 3). The bridge is clearly associated with the canal and so is not quite old enough to be considered for the NRHP. However, the bridge and the canal itself will be 50 years old in just four to nine years, and will need to be evaluated for future projects. The metal storage tanks are probably contemporary with the canal, but will need to be examined to determine their age. One is currently being tipped into the canal due to bankline erosion (Figure 6-18). The wooden dock and shed also require further investigation. As they are located close to Bayou Guilliame, there is a remote possibility that they predate the HNC.

Shipwrecks

Two derelict vessel locales were noted in the HNC during these investigations (see Plates 2 and 4). The northern most is a metal barge with a wooden shrimp boat on top of it, lying at the canal intersection with Bayou La Carpe (Figure 6-19). The barge portion of the double wreck appears to correspond to obstacle 3110 listed in Table 6-4. The second vessel locale is probably a metal barge abandoned at the canal intersection with Bayou Provost (Figure 6-20). Obstacle 632 in Table 6-4 apparently corresponds to this wreck. As both of these shipwreck sites occur where the HNC crosses natural waterways, they should be examined to determine if they are 50 years old or older. Other wrecks not visible above water clearly exist in the HNC (see Table 6-4). One possible location for unrecorded wrecks is in association with the wooden dock described above and located near Bayou Guilliame (see Plate 2).

Figure 6-17. HNC-7 on the east bank of the Houma Navigation Canal. View to the northeast. Date: 10/22/03.

a

b

Figure 6-18. Storage tanks in Existing Disposal Area Site E14. View to the southeast (a) and northeast (b). Date: 10/22/03.

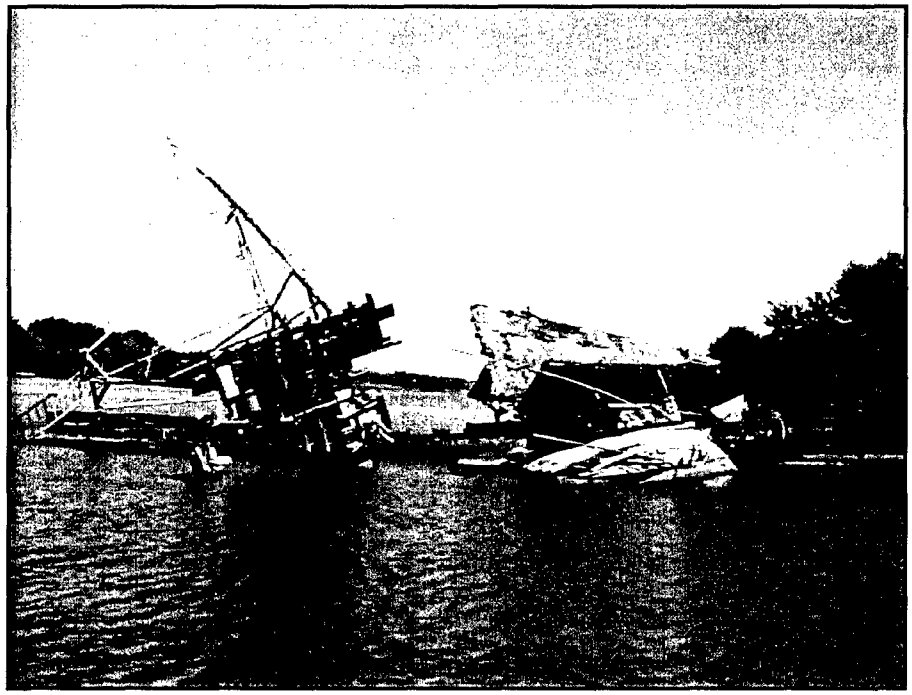

Figure 6-19. Barge and shrimping boat wreck at the intersection of the Houma Navigation Canal and Bayou La Carpe. View to the north. Date: 10/21/03.

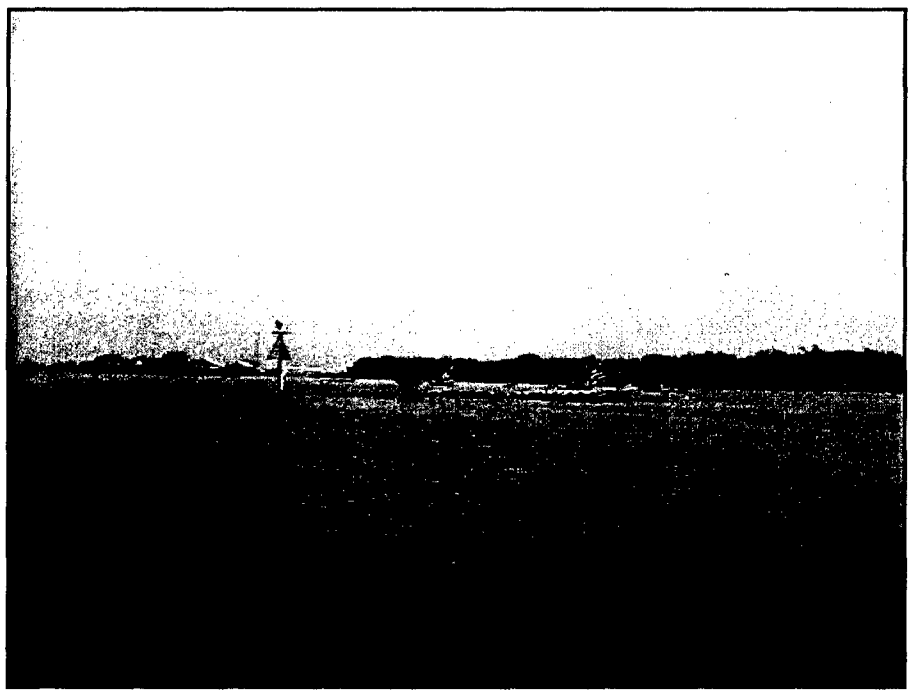

Figure 6-20. Barge wreck at the intersection of the Houma Navigation Canal and Bayou Provost. View to the northeast. Date: 10/22/03.

CHAPTER 7

RESEARCH DESIGN

Research Topics

The previous chapters on the environment and sequence of cultural development have raised a number of questions about human adaptation in the project region. These generally concern culture history, settlement systems, and demography. The sources used to form these questions include general models of the behavior of hunter-gatherers (Binford 1980; Jochim 1976) and agriculturalists (Rappaport 1968); previous archeological research within the Lower Mississippi Valley (Phillips 1970; Weinstein et al. 1979a), particularly within the Mississippi Deltaic Plain (Kniffen 1936; McIntire 1958; Gibson 1978b; Gagliano et al. 1979; Wiseman et al. 1979; Gagliano 1984; Goodwin et al. 1985b); and the work of cultural geographers in southern Louisiana (Knipmeyer 1956; Rehder 1971; Comeaux 1972).

Culture History

Gaps in our current understanding of the aboriginal culture history of the region are numerous. For instance, relatively few Archaic, Poverty Point and Tchula period occupations are known within the study area, although relict Teche-Mississippi deltaic deposits do exist there. For the Marksville period, it remains uncertain why the Mandalay phase shows greater similarities to Marksville assemblages farther up Bayou Teche than to those east of the study area in the Barataria Basin and the St. Bernard marshes. Conversely, why the Coles Creek phases identified within the study area show greater similarities to Coles Creek assemblages located to the east in the Lafourche Delta than to those further upstream along Bayou Teche remains unclear.

While Mississippi period occupations are common within the study area, most reflect Plaquemine culture and contain relatively few shell-tempered ceramics. Whether these shell-tempered ceramics represent cultural interaction such as trade or the presence of Mississippian culture groups has not been firmly established. Historic period occupations related to the Chitimacha and Houma tribes are certainly present within the study area. However, their date, distribution and character have not yet been defined.

For all the periods, more data is needed from more sites. Canal banklines which cut buried or subsided Teche distributary natural levees could be surveyed and auger cores taken to identify the landforms with which the earliest sites are associated. Additional ceramic collections and analyses from in and outside the region are necessary to elucidate the influences at work during the Marksville, Coles Creek, and Mississippi periods. Only comprehensive survey will find the sites and data needed to

initiate understanding of the native population in the early historic period.

Settlement Systems

Previous archeological and geographical research in Terrebonne and adjacent coastal parishes suggests that certain aspects of human adaptation to the deltaic plain have remained consistent due to the environmental constraints the region presents. In particular, the spatial relationship of settlements to the landforms or depositional environments of the deltaic plain exhibits marked continuity through time.

Certain features, especially elevated natural levees, appear to have been the predominant location of human habitation sites for all periods (Kniffen 1936; Knipmeyer 1956; McIntire 1958; Gagliano 1984; Gagliano et al. 1979). Several factors are responsible for this pattern. First, in many cases natural levee ridges were the only elevated and relatively well-drained terrain available. In this regard they provided a base for dwellings and land for agricultural fields. Natural levees also represented an important habitat for terrestrial game, as well as a source for raw materials. A third factor contributing to their extensive use by human groups was their proximity to open water. This was important not only for human subsistence, but for transportation as well.

The state of the channel adjacent to the natural levee was apparently a key factor in the choice of where to live. If the channel was still part of the active delta then flooding may have been severe enough to prevent permanent or even semi-permanent occupation. However, if the channel had been abandoned, then long-term habitation may have been possible. The cycle of biological succession within the surrounding delta, which determined the productivity of the nearby swamp and marsh environments, was also of great importance (Gagliano and van Beek 1975).

Relict beaches or barrier islands were also chosen for habitation (Shenkel 1974:41; Brown 1984:100). These features are much less common than natural levees, so that the number of sites actually associated with them is much smaller. In addition, they often did not provide the expanse of elevated, well-drained land available on natural levees.

Other depositional environments found within the deltaic plain, including active and abandoned channels, swamps, marshes, active beaches, lakes and interdistributary bogs, served primarily as resource extraction zones or transportation routes and were seldom the location of habitations until the advent of recent technologies for flood-proofing structures. Exploitation of these environments often took place from settlements located on nearby natural levees or relict beaches, but may also have involved the short-term use of resource extraction sites. This type of site would be located not only in depositional environments unsuitable for long-term habitation, but also along natural levees or relict beaches beyond the range of habitation sites.

Several questions persist concerning site location in the deltaic plain. For example, do human habitation sites in the deltaic plain generally occur on relatively stable, elevated landforms (in this case natural levees and relict beach ridges), while short-term resource extraction sites occur in a variety of depositional environments? Also, are the majority of prehistoric habitation sites within the study area associated with relict deltaic features rather than active ones, and if so are resource extraction sites associated with both environments? Determining the function of sites in the project region, as well as the landforms with which they are associated should help clarify some of these issues.

More data are also needed to determine how site function, size, and distribution varied over time. Determining the size of Archaic and Poverty Point period occupations within the study area and collecting floral or faunal remains which may provide seasonality information would help determine if all the Archaic and Poverty Point period components within the study area were small and occupied seasonally. The size, depth of deposit, and artifact assemblages from later sites of the Tchula, Marksville, and Coles Creek periods would reflect the presence of semi-permanent or permanent villages, resource extraction sites, and also centralized burial and platform mounds. The type, size and distribution of these sites and the landforms they occur on might also provide information on an emerging site hierarchy. Similar data would be needed from Mississippi period sites in order to identify agricultural hamlets and small political polities.

Information is also lacking on the size and number of historic aboriginal components within the study area and their associated artifact assemblages. Archaeological data could be supplemented by oral histories in the case of the Houma. Colonial, Antebellum, Postbellum, and Modern period components

in the study area could provide information on the size, number, and types of structures and artifact assemblages distinctive of each era. Cartographic and archival information could serve as a supplement to the archaeological data collected.

Demography

The general belief is that population increased over time in the project region. Size data from sites in the study area are necessary to verify and document this pattern. Once components at each site are identified, an assessment of the change in total area occupied could be determined by culture or by century.

Paleogeography

Archaeological sites with dated occupations in the project area could also be used to refine our knowledge of the age of specified watercourses in the area. This information then might address the age and duration of specific elements (delta lobes/sublobes, distributary segments, etc.) of the Teche and Lafourche delta systems.

Field Methods

The research topics outlined in the previous section involve generalizations concerning human occupation of the study area in the past. Although the proposed project area is narrow and very tightly defined, data collected there would nevertheless increase our understanding of human habitation in the deltaic plain. So little comprehensive survey has been conducted in the region that all new data collected would be of great value. Also, the sites that can provide this data are a fleeting resource, given the rapid rate of land loss in the region over the last 50 years. The field methodologies recommended below apply to the three major classes of cultural resources expected in the project area—archaeological sites, standing structures, and shipwrecks.

Archaeological Sites

Two phases of work are necessary to identify and evaluate all archaeological sites in the project area. Phase I would consist of a complete bankline survey of the HNC itself. A subsequent systematic survey of the those areas with a high probability for containing archaeological sites located in the dredge spoil sites to be employed by the proposed project would constitute phase II.

Bankline Survey of the HNC

As the entire HNC is to be dredged and thus impacted, a complete bankline survey of the canal is required. The canal was initially excavated between 1958 and 1962 and has been dredged several times since, all prior to any comprehensive archaeological investigations. The background research and the reconnaissance survey conducted as part of this study clearly show that the HNC cut through several archaeological sites, and that remnants of some of them survive, despite repeated dredging (see Figures 6-1 and 6-10). The canal is known to have impacted three previously recorded sites (16TR12, 16TR18, and 16TR72) and a minimum of seven unrecorded sites (HNC-1 through HNC-7). Some 23 additional shell deposits were noted in just the northern third of the canal during this study, suggesting that the number of unrecorded sites along the HNC is much higher (see Plates 1 to 5). Given the rapid widening of the HNC due to wave wake erosion over the last 40 years, sites not initially impacted by the canal's construction may be newly exposed.

The canal banks can be surveyed by two-to-four-person crews operating in small boats. Both banks of the canals should be carefully examined for cultural material. If the banks are obscured by vegetation small areas should be cleared or the bankline probed at 30 to 50 m intervals. The banklines can be surveyed from a slow-moving boat. When cultural material is indentified, the boat should be docked and the bankline walked if possible.

Two systematic surface collection methods can then be employed at discovered sites, again depending on site condition and location. Many of the sites are expected to occur in a linear pattern along the canal or natural watercourse cut by the canal, producing an accumulation of lag "beach" material (primarily *rangia* and/or oyster shell in the case of prehistoric sites) along the bank. This beach material can be sectioned off into 10-to-30-m long collecting units, depending on the overall length of the beach deposit. The units will extend from the waters edge to at least the bankline and then continue on top of the bank where possible. All cultural material should then be collected by unit. The unit bounderies will also serve as a site grid.

For well-preserved, intact sites which are not oriented parallel to a specific bankline, a "ray" pattern of transects can be employed. In this system, the presumed central point of each site or midden

location is identified and a series of lines run out from that point at specific angles to the cardinal directions. Initial lines should be placed at 90°, 180°, 270°, and 360°. These could then be supplemented by additional lines at 45°, 135°, 225°, and 315°, if more detailed information on site size or configuration is required. Pedestrian survey and subsurface testing can be conducted along these transects.

In order to determine the size, depth, and condition of each site, subsurface testing will be required. On shell midden sites, a six to eight foot probe should be used at 20 to 30 m intervals along the transects of the site grid to determine the depth and extent of the shell deposit both above and below water. Shovel and/or auger tests should then be excavated at selected locations on the site grid to determine the type of landform the site occurs on, detect earth-midden deposits, and perhaps acquire diagnostic artifacts to augment the surface collections. Shovel tests may prove sufficient for sites not already buried by spoil, but augering will be needed at the deeply buried sites. For earth midden sites such as low midden "mounds" situated in the swamp or marsh, the auger should be used in lieu of the probe for site delineation.

When shovel tests are incorporated in the assessment procedures, all soil removed from each hole should be dry-screened through 1/4-in wire mesh where possible. Data from each auger or shovel test, including soil stratum, depth, soil type, soil color, soil texture, and inclusions (such as charcoal, sherds, lithics, faunal remains, etc.) should be collected.

Each site should be photographed from various angles to provide a record of its condition. A sketch map should also be produced for each site identified. The map should be to scale and show the locations of all subsurface tests and surface collection units. Important environmental, cultural, and physiographic features, such as canals, modern standing structures, vegetation, etc., should also be included on the map. Precise site positions should be obtained with differential GPS. The overall aim of all these assessment procedures would be to determine whether or not each site is eligible for inclusion in the National Register of Historic Places.

Systematic Survey of Dredge Spoil Sites

As the proposed project area includes numerous dredge spoil sites, in addition to the canal itself, a systematic survey of these areas is also necessary. Two recent and comprehensive studies conducted in the project region both indicate that almost all, if not all, archaeological sites are located on once elevated landforms, regardless of site function (Robblee et al. 2000:99; Weinstein and Kelley 1992:379). Some of these landforms remain elevated today, while others have subsided. Other predictive models for site location in south Louisiana have produced the same results (Beavers 1982; Franks and Yakubik 1990; Gagliano et al. 1979; Speaker et al. 1986; Smith et al. 1986). Therefore, all elevated or once elevated landforms, particularly natural levees, in the project area are designated high probability areas for finding sites and require complete survey.

The utility of this approach in the project area is reflected in the results of the reconnaissance survey conducted as a part of this study. All seven new sites and 25 shell deposits identified occur in high probability areas along natural levees associated with bayous or crevasse channels cut by the HNC. Furthermore, in every high probability area examined in detail, a site or shell deposit was encountered. Those areas deemed high probability are shown on the project plans in Plates 1 to 5 and encompass 691.48 ac. These high probability areas are fairly numerous due to the number of natural channels cut by the HNC, and because the canal was originally positioned to follow the routes of preexisting waterways where possible. For instance, the upper end of the canal roughly follows the course of Bayou La Carpe from Houma down to Crozier, a distance of almost two miles.

First, all natural levee and abandoned beach landforms in the project area require identification. This includes those features exposed at the surface as well as those that Smith et al. (1986) identify as subsided and buried channels, the reason being that these buried channels have associated natural levees. The size of the natural levees associated with these subsided distributaries is currently unknown. However, for the purposes of this study it is assumed that levees associated with major distributary channels extend 300 m either side of the channel, while those of smaller distributaries extend 100 m either side of the channel. If the natural levees associated with these channels are obviously wider than the above measurements in some areas, the survey area should be expanded to encompass the entire landform. Those zones having a presumed low probability of containing archeological sites, including all areas identified as inland swamp, fresh marsh, brackish marsh, and salt marsh, do not require further investigations.

The survey should entail a pedestrian search of all high probability areas to locate midden areas, whether these are exposed shell lenses, organically stained earth-midden lenses, or low midden "mounds" situated in what are today swamp or marsh. Pedestrian survey should be conducted along transects spaced at 20-to-30-m internals, generally perpendicular to the nearest bankline, natural or otherwise. Subsurface excavations, using a probe, shovel or auger, should be carried out at 20-to-30-m intervals along each transect. It is expected that earth-midden sites situated on elevated natural levees, and crossed during the terrestrial transect portion of the survey, would be examined principally through the use of shovel tests. Buried or subsided shell middens, on the other hand, would be assessed by probing and auger borings. The soil from all shovel tests should be screened through 1/4-inch wire mesh, if possible. If artifacts or other indications of human activities are encountered, then the site assessment procedures discussed above should be initiated.

In the event that unmarked burial sites or human skeletal remains area encountered during the course of these investigations or during construction, the provisions of the Louisiana Unmarked Human Burial Sites Preservation Act (Louisiana R.S. 8:671 and R.S. 36:209 (I) and 802.13) shall apply. This includes construction occurring anywhere on the permitted property, regardless of previously determined significance. Upon the discovery of such remains, all work which could further damage the unmarked burial, human skeletal remains or associated burial artifacts should immediately cease and the local law enforcement agency and the U.S. Army Corps of Engineers, New Orleans District, notified. If it is determined that the burial is not a crime scene, the State Historic Preservation Officer (SHPO) should be notified and a specific plan for the avoidance, mitigation, excavation, and/or reinterment of those remains developed through consultation with the State Archaeologist, who is Chairman of the Louisiana Unmarked Burial Sites Board. In the interim, every effort should be made to protect the remains from further disturbance. All human remains should be treated with dignity and respect.

Standing Structures

Data collected during the current study indicates that very few standing structures exist in the project area. Most of the project area was forested when the 1956 aerial photographs were shot (Amman International Corporation 1956). Any structures that may have been standing at that time would have been obscured by the trees. The only community in any proximity to the canal is Cocodrie.

While high probability areas for archaeological sites do not always coincide with those for standing structures, in the restrictive delta plain environment they appear to. Therefore, a survey for standing structures can be conducted in tandem with the archaeological survey of the HNC bankline and high probability dredge spoil site areas. The only structures noted during the current study are: the Dulac pontoon bridge; a wooden shed and abandoned wooden dock on the east bank of the HNC just south of Bayou Guilliame; and three metal storage tanks in Existing Disposal Area Site E14 on either side of the old crevasse channel of Bayou Grand Caillou (see Plates 2 to 3). These, and any other structures identified in or adjacent to the project area, will need to be evaluated to determine if they are 50 years old or older. If they are of sufficient age, they will need to be recorded and their National Register eligibility determined.

Shipwrecks

As noted previously, the possibility for historic shipwreck sites in the HNC proper is considered relatively low, despite the fact that it crosses numerous natural channels. This is principally because these channels tend to be small and were never heavily traveled by watercraft. The main exceptions are Bayou Grand Caillou and Bayou Petit Caillou, both of which are crossed by the HNC and both of which have seen heavy use by watercraft throughout the historic period. Previous research has demonstrated that these, and other larger waterways in the region, contain numerous sunken and derelict vessels that have been purposefully abandoned or accidentally lost. On Bayou Grand Caillou itself, Flayharty and Muller (1983) recorded 69 derelict boats, including luggers, trawlers, Lafitte skiffs, and tow boats, as well as modern recreational craft. Six of these vessels were identified as potentially eligible for inclusion in the National Register of Historic Places. In a reconnaissance survey of Bayou du Large, located just west of the HNC, Stout (1992) recorded the presence of 37 derelict vessels between Falgout Canal and Grand Pass. These included wooden luggers, Lafitte skiffs, and flatboats, as well as steel- and fiberglass-hulled boats. Stout, specifically, notes the historic importance of some of these vessels as "folk boats;" vernacular craft that are no longer being made in the area and whose remains as archaeological sites

may provide the best or "only surviving record of their existence" (Stout 1992:23). Thus, there is some possibility that abandoned or sunken vessels could exist where the HNC crosses Bayous Grand and Petit Caillou. The crossings of the lesser bayous, which might have been traveled by small craft such as pirogues or skiffs, may also have been the loci of the abandonment or sinking of these types of vessels.

The HNC itself is not yet 50 years old, and its excavation and repeated dredging presumably would have destroyed any wrecks within its path. However, there is always the possibility that wreck remains occur along the edges of the HNC either where dumped in the past via dredging or newly exposed as the HNC rapidly widens due to wave wake erosion. Such occurrences would be most likely where the HNC crosses natural channels that may have been used by vessels or been the site of their abandonment. It is even possible that some of the modern wrecks and navigation hazards on the HNC were snagged by the remains of older wrecks.

A ship 50 years old or older may also have wrecked in the canal since its opening. The wooden shrimp boat noted during this study may be an example of such an occurrence (see Figure 6-19). A third possibility is that older ships have sunk or been abandoned at old docking areas on the natural waterways cut by the HNC. For instance, underwater survey of old dock facilities on Bayou Schaffer in nearby St. Mary Parish revealed some 20 sunken vessels ranging in date from roughly 1880 to 1970 (Charles Pearson, personal communication 2003; Pearson and Saltus 1991). The abandoned wooden dock noted just south of Bayou Guilliame during these investigations may be such a location (see Plate 2).

The likelihood of shipwreck sites in the project area increases somewhat when the proposed dredge spoil sites are considered. Several of these sites encompass significant stretches of natural waterways, most of which have seen little or no boat traffic or alteration since superceded by the HNC in 1962. An unnamed drainage runs through dredge spoil Sites 1 and 13A and Bayou Provost through Sites 13B, 12A, and the access to Site 12 (see Plates 1 and 2). Although Bayou Provost appears to have been straightened, the presence of shell midden site 16TR89 along its southern bank between dredge spoil Sites 12 and 13 proves that portions of the bayou still follow their original course (see Plate 2). Bayou Guilliame runs through Sites 12A and 11A, a crevasse channel of Bayou Grand Caillou through Sites E14 and 11, Coteau Charles/Mill Creek through Sites E15C and E15D, Mound Bayou through Site 16, and Wax Bayou through Site 19C (see Plates 2 to 4). Any of these small, natural channels may have been used by watercraft in the past, and might contain lost or abandoned vessels.

A remote-sensing survey of the HNC itself is not recommended, primarily because of the very low potential for historic vessel remains along most of the canal and the large amount of modern metal debris known to exist, particularly in the northern portion of the canal. Instead, informant interviews are recommended to determine what, if any, wrecks, docks or navigation hazards on the HNC might be 50 years old or older, including the two derelict vessels noted in the HNC during these investigations and the 11 sunken or abandoned craft considered navigation hazards by the U.S. Coast Guard (see Figures 6-19 and 6-20 and Table 6-4).

The informant interviews then need to be supplemented with visual reconnaissance of the canal, with particular attention paid to those areas where it crosses natural channels. At these locations, particular note should be made of docks, landings, etc., as well as any exposed or sunken vessels. This examination for non-terrestrial cultural resources can be conducted in tandem with the complete bankline survey of the HNC recommended previously for archaeological sites. For all vessels revealed by the informant interviews and/or bankline survey, background research, a remote sensing survey, and/or diving on targets could then be conducted, if necessary, to determine their age and NRHP eligibility.

Informant interviews and visual reconnaissance are also recommended to detect watercraft in bayous crossing the proposed disposal areas. These areas are all defined as having a high probability for containing archaeological sites, and therefore will be visually examined by boat during that part of the investigations. If wrecks are detected via informant interview or visual reconnaissance, they should be evaluated as described above.

Summary

In summary, a complete bankline survey of the HNC is recommended with the intention of identifying terrestrial and underwater archaeological sites and historic standing structures. A complete survey of all high probability areas in the proposed dredge

disposal sites is also necessary to identify the same sorts of cultural resources. No additional work is recommended in the low probability areas of the dredge disposal sites. The need to gather this kind of cultural resource data has grown more urgent due to the rapid rate of land loss in the region over the last 50 years. Essentially, as sites are lost at an ever-increasing rate, it lessens, at a similarly increasing rate, our ability to ever address many of the research questions of interest noted above.

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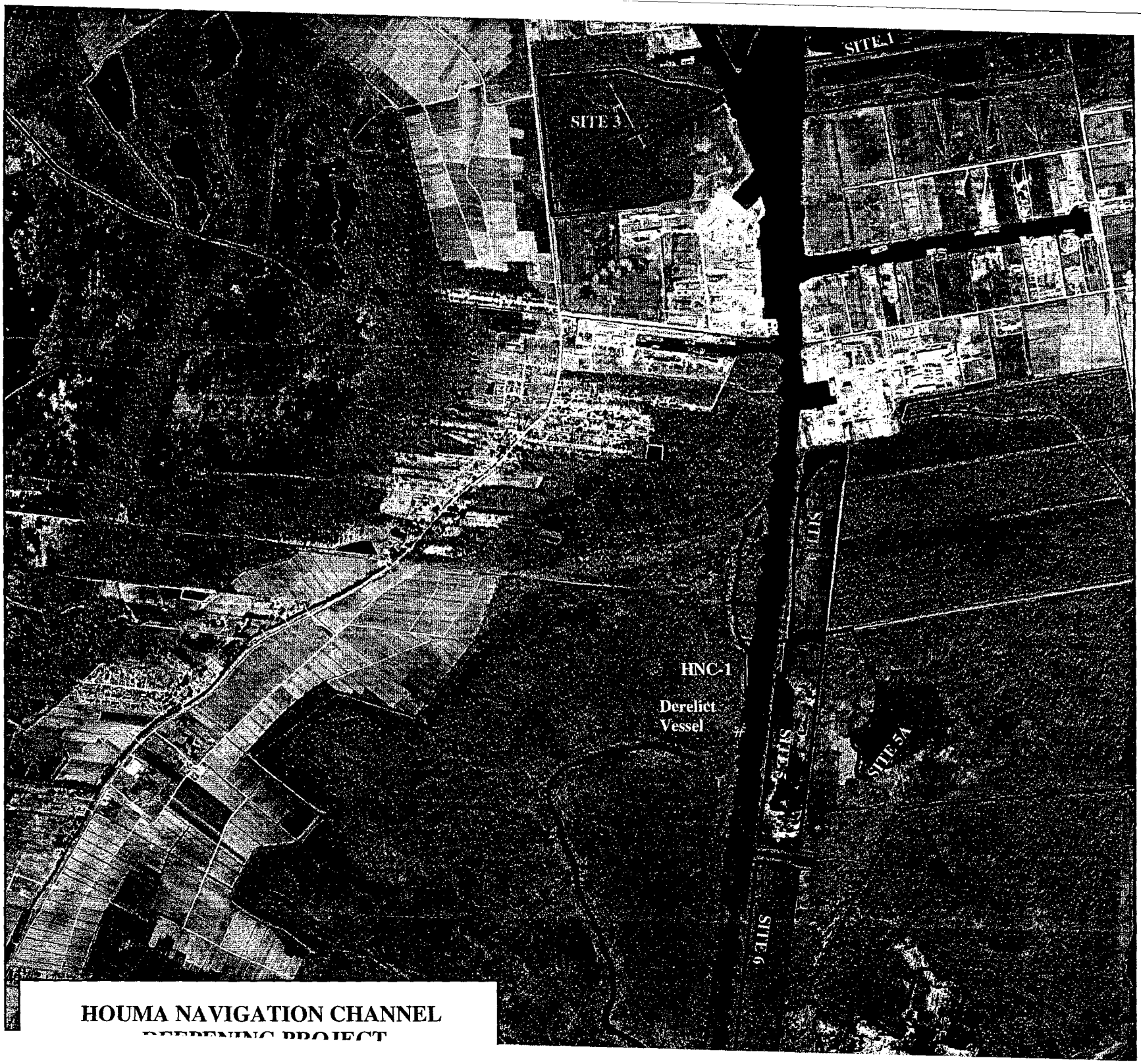
APPENDIX:

PLATES OF PROJECT PLANS FOR THE HOUMA NAVIGATION CANAL DEEPENING PROJECT


SITE 2
SITE 1
SITE 3



HOUMA NAVIGATION CHANNEL
DEEPENING PROJECT

2

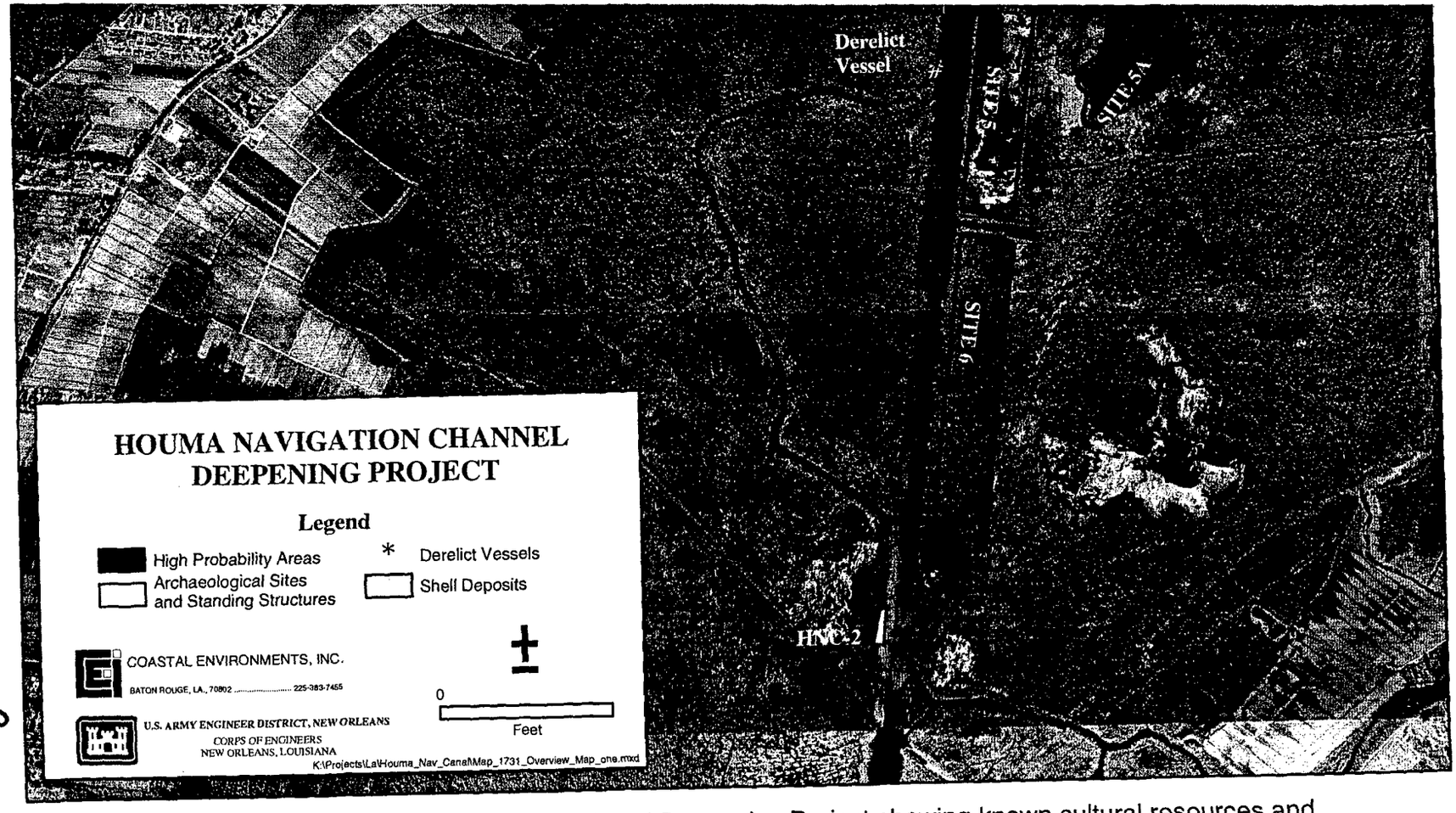


Plate 1 of 5. Project plans for Houma Navigation Canal Deepening Project showing known cultural resources and high probability areas.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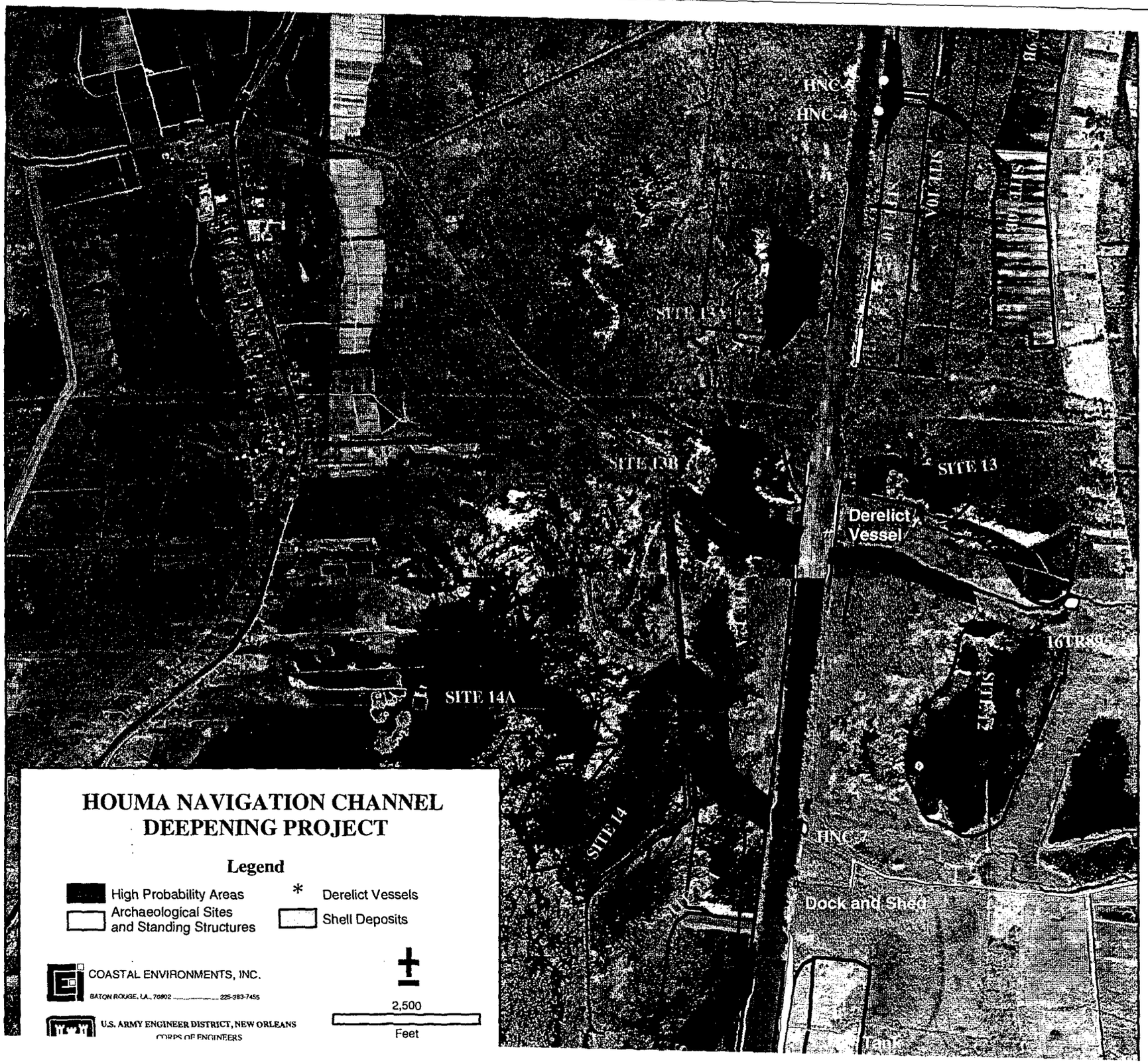
SITE 8
SITE 9A
SITE 9B
SITE 10A
HNC
HNC
HNC



HOUMA NAVIGATION CHANNEL DEEPENING PROJECT

Legend

- High Probability Areas
- Archaeological Sites and Standing Structures
- * Derelict Vessels
- Shell Deposits

COASTAL ENVIRONMENTS, INC.
BATON ROUGE, LA., 70802 225-383-7455

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

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Feet

2

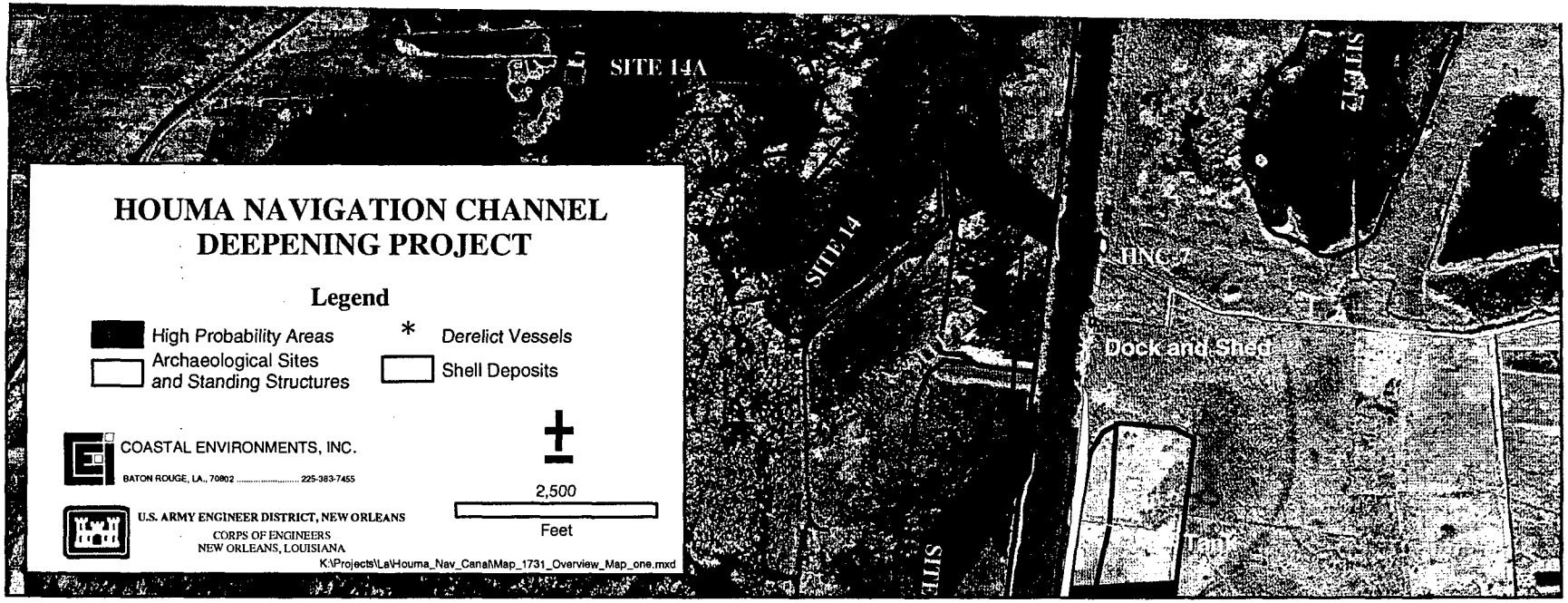
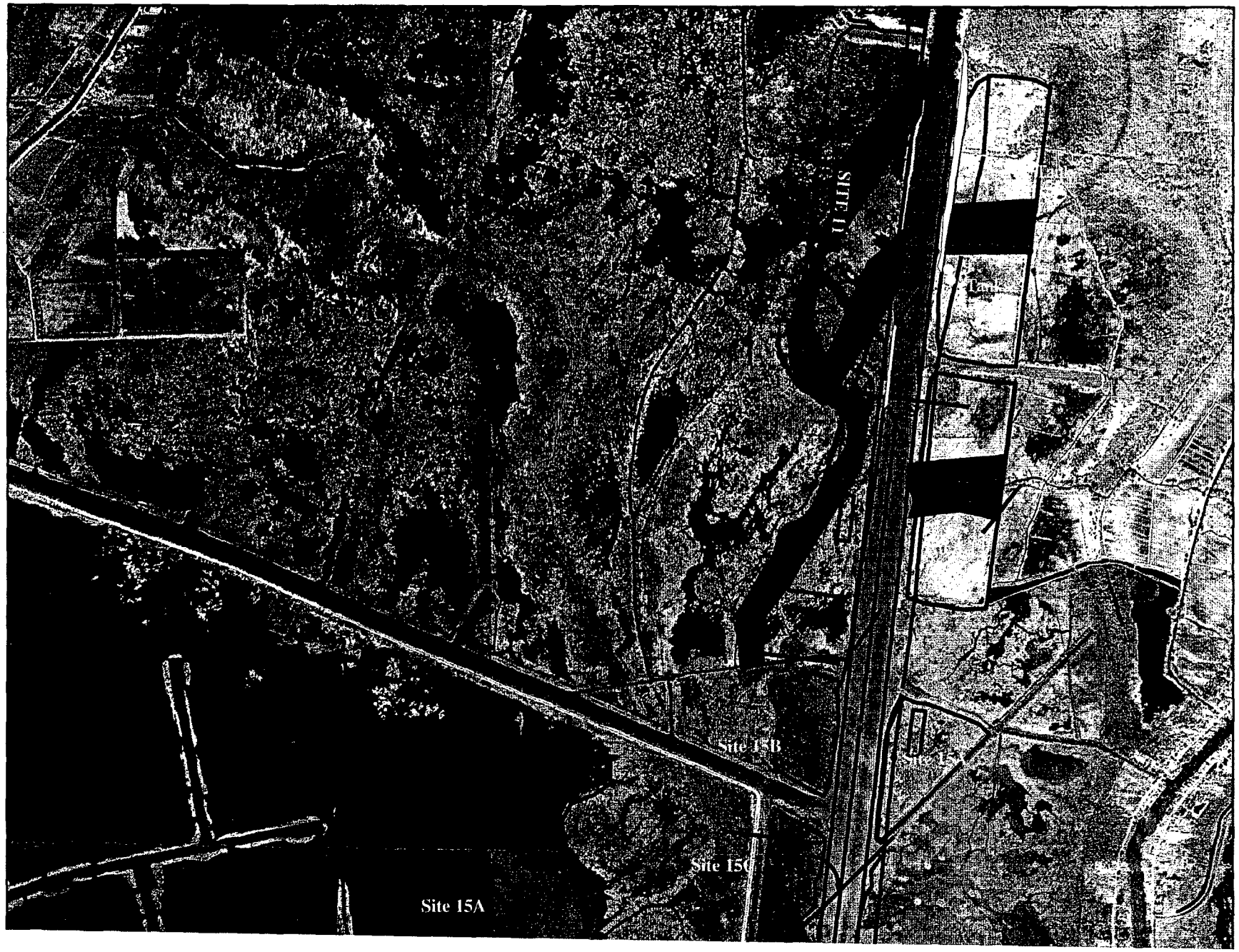


Plate 2 of 5. Project plans for Houma Navigation Canal Deepening Project showing known cultural resources and high probability areas.

3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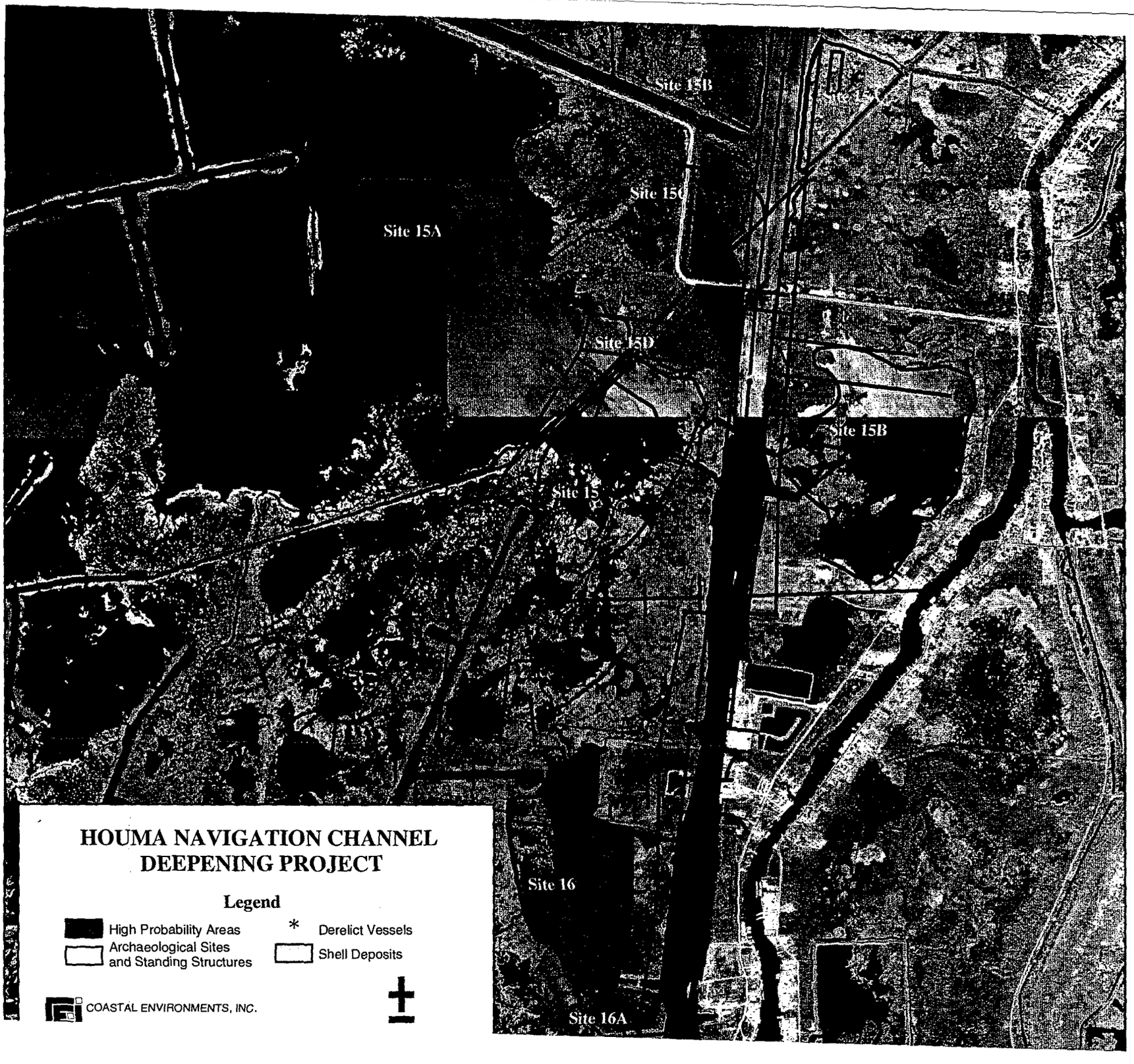
Site 15B
Site 15C
Site 15A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HOUMA NAVIGATION CHANNEL
DEEPENING PROJECT
Legend
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and Standing Structures
Derelict Vessels
Shell Deposits
COASTAL ENVIRONMENTS, INC.

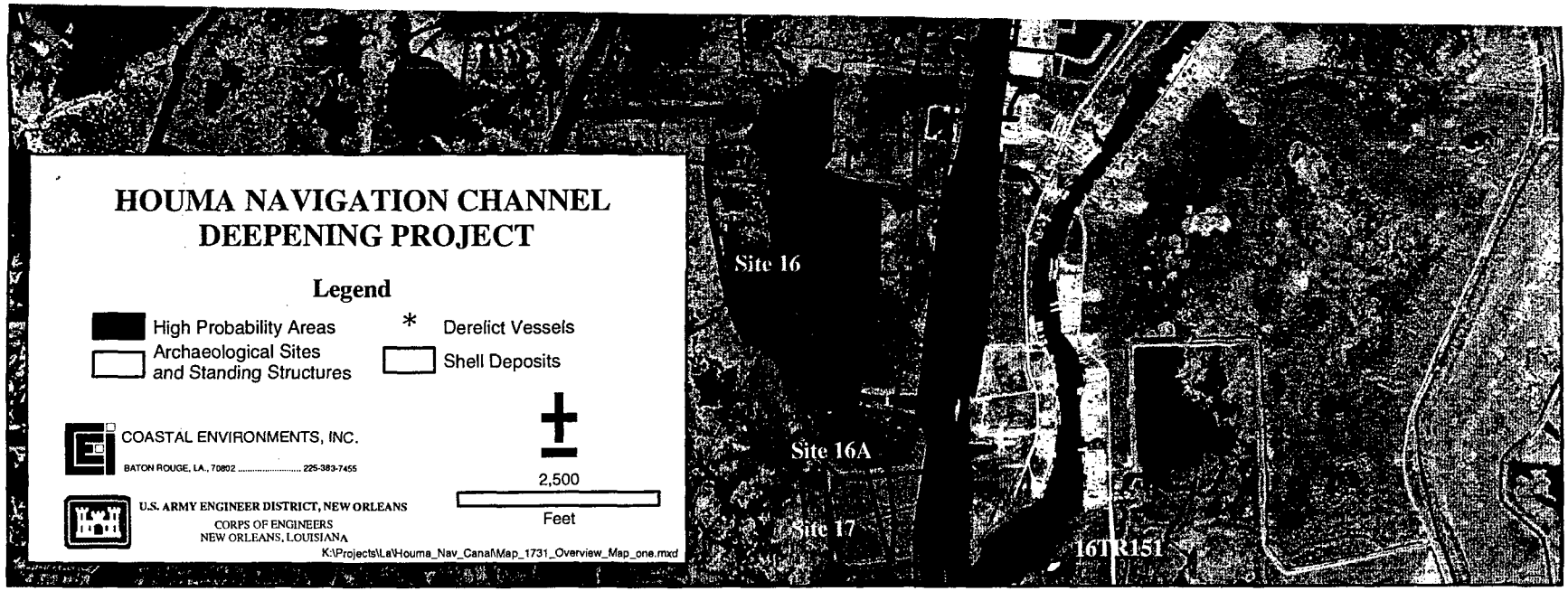

Plate 3 of 5. Project plans for Houma Navigation Canal Deepening Project showing known cultural resources and high probability areas.

3


16TR151
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16TR115


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Derelict
Vessel
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Site 20?
HOUMA NAVIGATION CHANNEL
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High Probability Areas
Archaeological Sites
and Standing Structures
* Derelict Vessels
Shell Deposits

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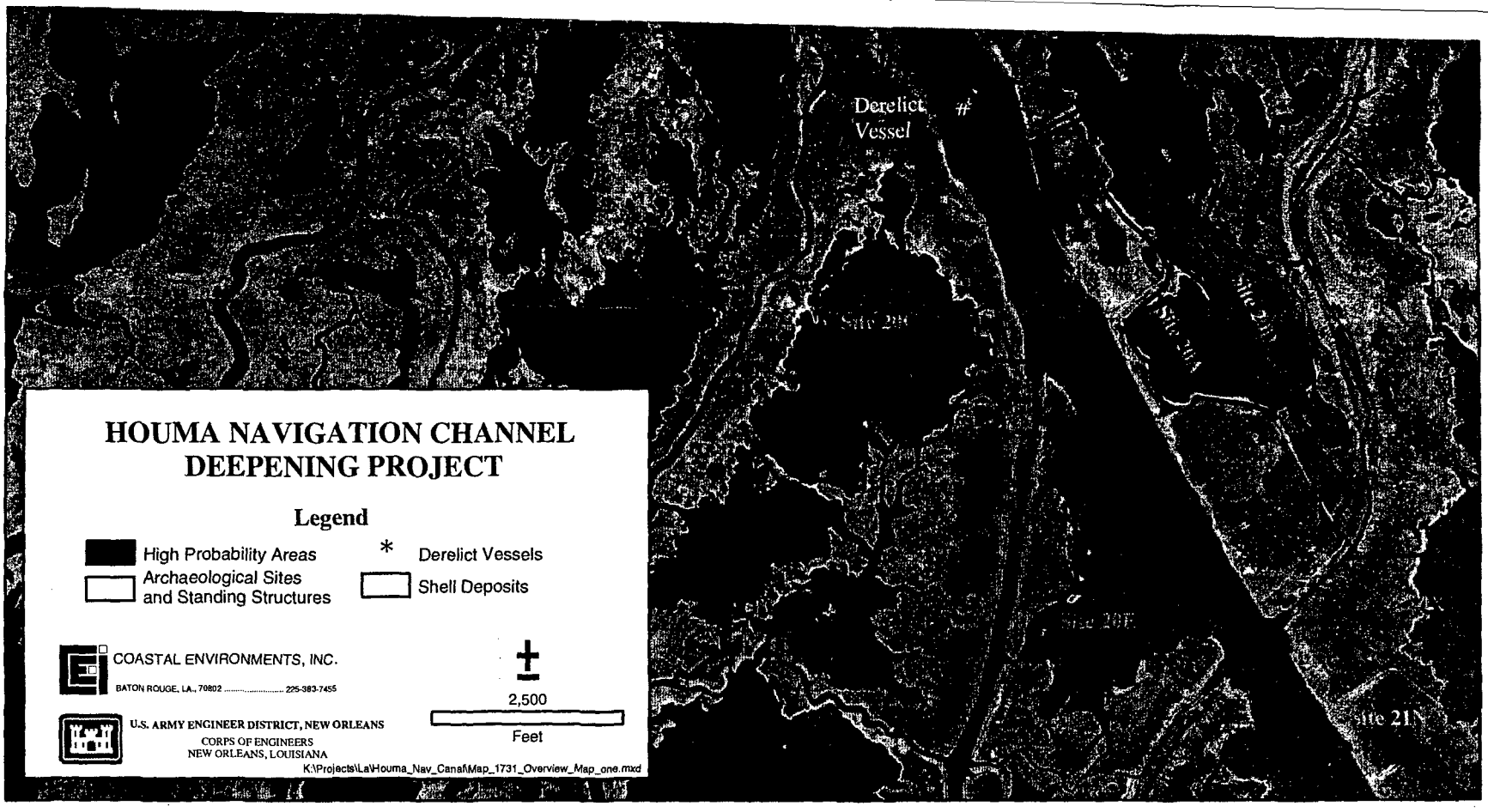
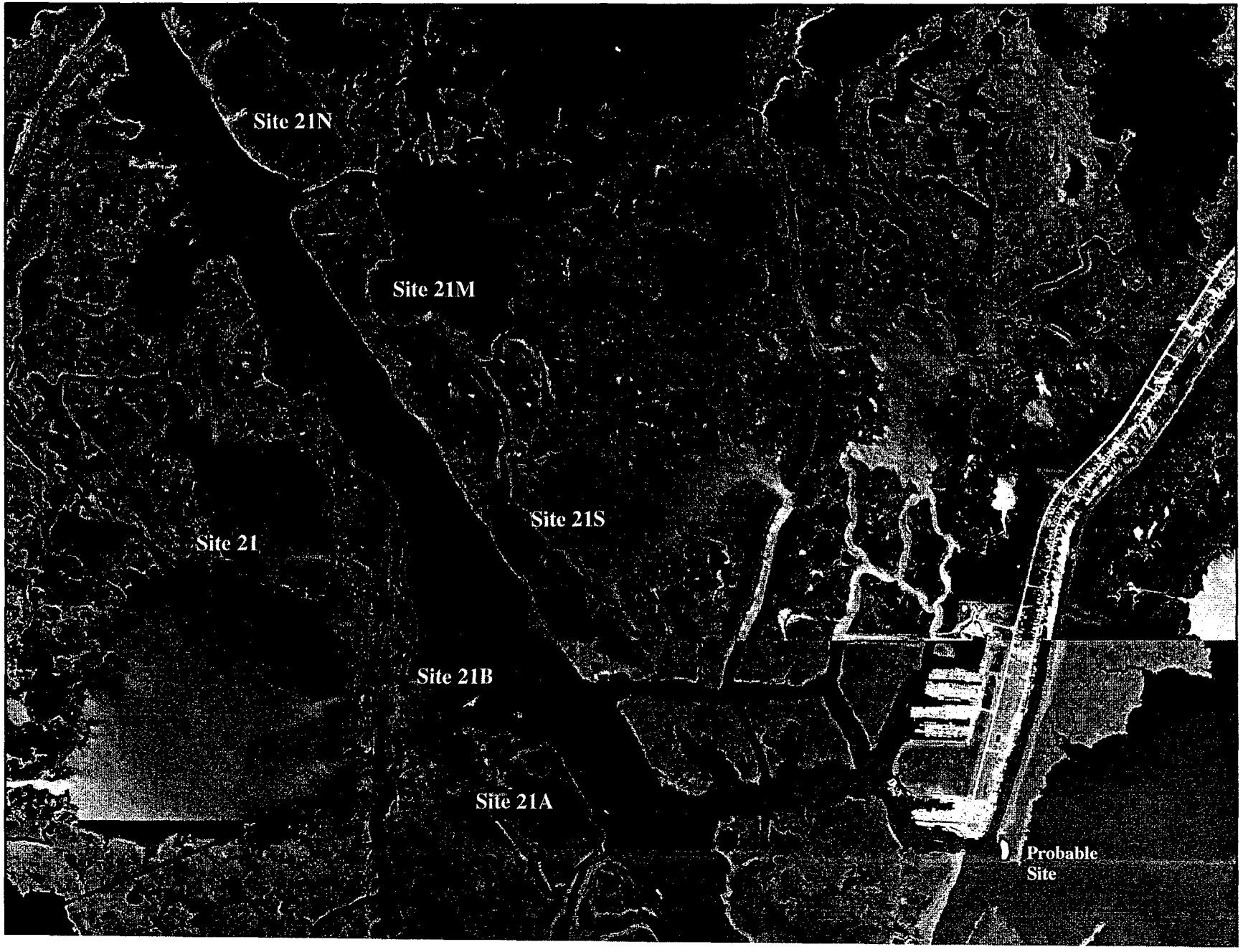


Plate 4 of 5. Project plans for Houma Navigation Canal Deepening Project showing known cultural resources and high probability areas.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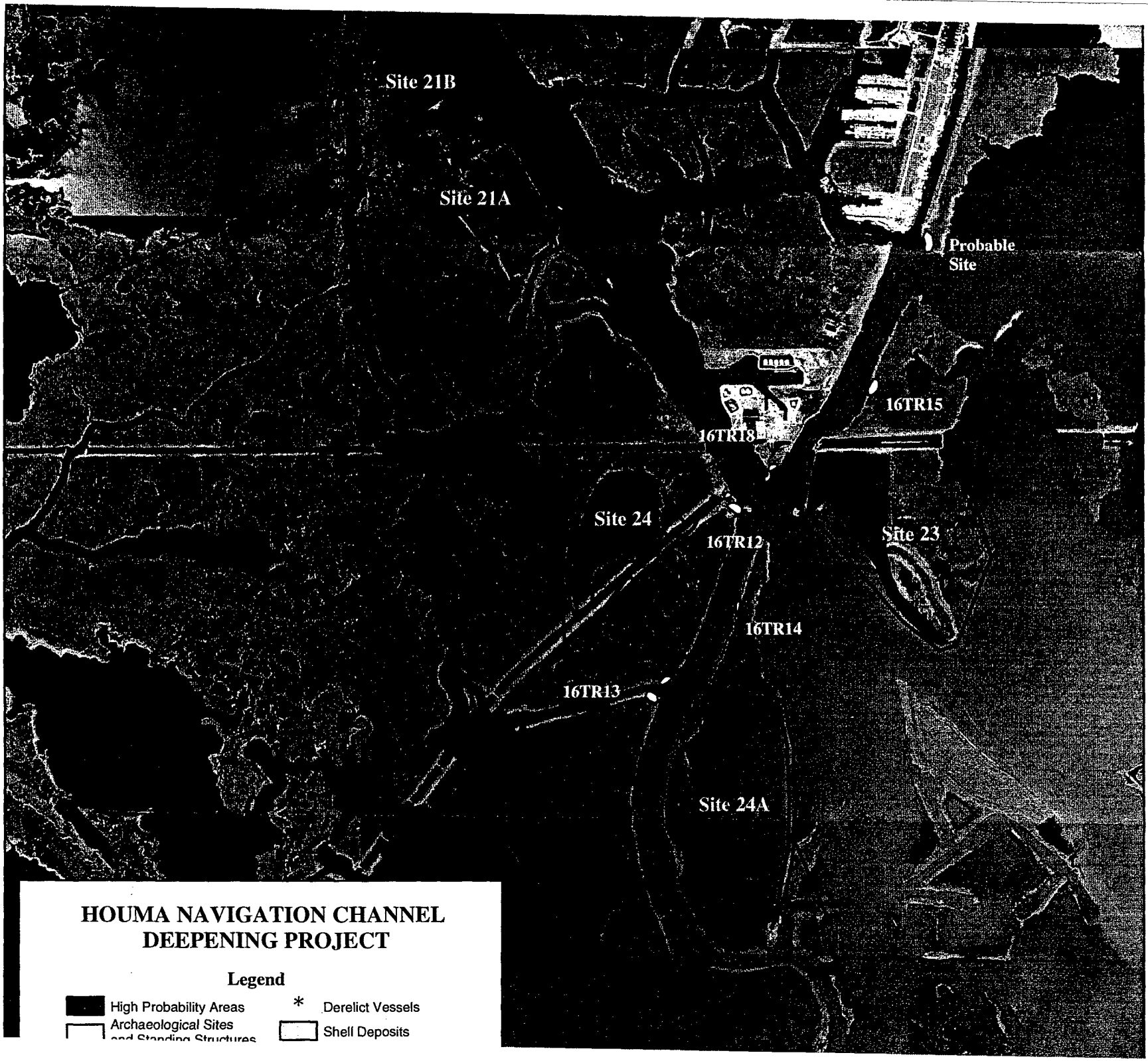
Site 21
Site 21B
Site 21A
Probable
Site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Site 21A
Probable Site
16TR15
16TR18
Site 24
16TR12
Site 23
16TR14
16TR13
Site 24A
HOUMA NAVIGATION CHANNEL DEEPENING PROJECT
Legend
High Probability Areas
Archaeological Sites and Standing Structures
* Derelict Vessels
Shell Deposits

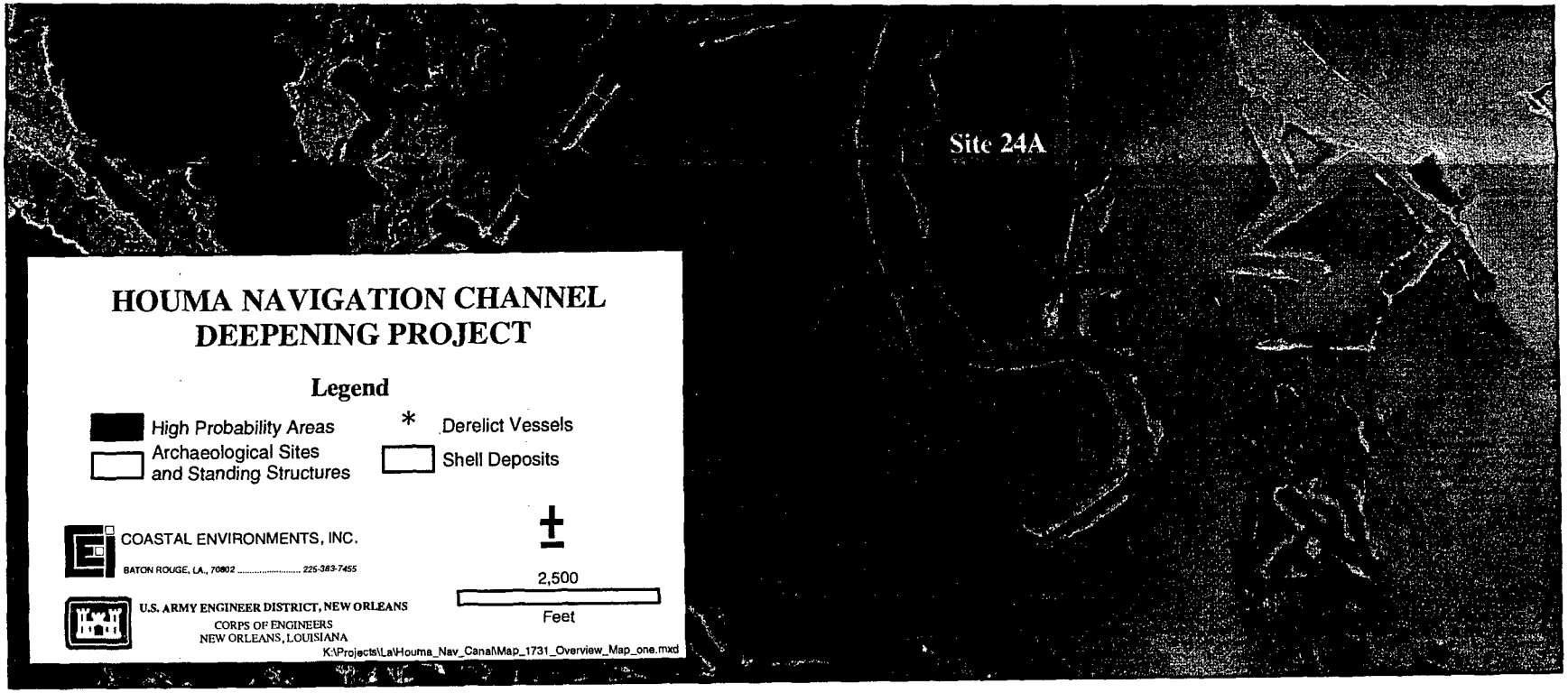

Plate 5 of 5. Project plans for Houma Navigation Canal Deepening Project showing known cultural resources and high probability areas.

3

ANNEX I

From:	Carlos Perez
To:	Jonathan Puls
Subject:	FW: email
Date:	Tuesday, October 04, 2016 8:34:06 AM
Importance:	High

Carlos J. Perez | GIS Project Manager
G.E.C., Inc.
Direct Phone: (225) 612-4185| Cell Phone: (225) 907-5070 | Fax: (225) 612-3016
Email: cperez@gecinc.com

From: Rachel Watson [mailto:rwatson@crt.la.gov]
Sent: Tuesday, October 04, 2016 8:15 AM
To: Carlos Perez
Subject: RE: email
Importance: High

The Division of Archaeology will not require any additional survey of the disposal areas of the Houma Navigation Canal.

Sincerely,

Rachel Watson
Office of Cultural Development
Department of Culture, Recreation, & Tourism
P.O. Box 44247
Baton Rouge, LA 70804
1051 N. Third Street, Room 318
Baton Rouge, LA 70802
(225) 342-8165
Section 106 submissions: Section106@crt.la.gov