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Conrad's Point	East Baton Rouge Parish	Missouri Bend	Steamboats
Cottage Plantation	Laurel Place or Plantation	*Princess*	Sugar
Cotton	Louisiana	Red Eye Crossing	Underwater archeology
Currier & Ives	Magnetometer	Remote sensing	West Florida Rebellion

19. ABSTRACT (*Continue on reverse if necessary and identify by block number*)

A magnetic and acoustic remote sensing survey for submerged cultural resources was conducted in the Mississippi River south of Baton Rouge, Louisiana, between River Miles 223.3 and 224.7-L. The project area encompasses the proposed site of a series of six dike structures to be built to maintain the depth of the navigation channel at Red Eye Crossing M-224 AHP. The survey was conducted for the U.S. Army Corps of Engineers, New Orleans District, pursuant to Delivery Order 0001 of Contract Number DACW29-92-D-0011.

A controlled hydrographic survey was performed over the 285.1-ac project area utilizing a proton precession magnetometer to collect magnetic data, a side-scan sonar to record acoustic anomalies, and a precision echosounder to acquire bathymetry. Real time positioning was maintained by a Differential Global Positioning System (DGPS) linked to a computer navigation program.

Sixty-eight magnetic anomalies were recorded during the survey. On target, which was associated with a cluster of magnetic anomalies and an acoustic anomaly, appears to be the remains of a spud barge lost in 1979. A second cluster of anomalies is associated with an acoustic image of the wreck of a wooden hulled vessel. This wreck is believed to be the remains of the sidewheel steam packet *Princess*, which sank in the area in 1859. A plan was developed to allow construction to proceed, which would permit documentation of the hull remains within the protection of the dikes.

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DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

July 2, 1993

Planning Division
Environmental Analysis Branch

To The Reader:

This cultural resources effort was designed, funded, and guided by the U.S. Army Corps of Engineers, New Orleans District, as part of our cultural resources management program. The work was performed to provide information needed to assess cultural resource impacts which could result from construction at Red Eye Crossing, for the Mississippi River, Baton Rouge to the Gulf of Mexico Project.

This study identified anomalies that may be the remains of the Princess, a potentially significant cultural resource. If feasible, efforts will be undertaken to assess the potential significance of the site. This report has been reviewed and accepted by the New Orleans District. We commend the contractor's efforts and careful scholarship.

James M. Wojtala
Technical Representative

Edwin A. Lyon
Authorized Representative
of the Contracting Officer

R. H. Schroeder, Jr.
Chief, Planning Division

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UNDERWATER CULTURAL RESOURCES SURVEY FOR CONTRACTION DIKES AT RED EYE CROSSING, MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LOUISIANA

FINAL REPORT

R. Christopher Goodwin, Ph.D.
Principal Investigator

By

Jack Irion, Susan Barrett Smith,
David Beard, and Paul Heinrich

R. Christopher Goodwin & Associates, Inc.
5824 Plauchc Street
New Orleans, LA 70123

June 1993

For

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

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At R. Christopher Goodwin & Associates, Inc., Dr. R. Christopher Goodwin served as Principal Investigator. Project management was provided by Mr. William P. Athens. Dr. Jack B. Irion served as Marine Archeologist and supervised the investigations. Archeological assistants included David Courington, Jeremy Horowitz, and John Creed. Both David Courington and David Beard served as Remote Sensing Specialists for the project. Susan Barrett Smith developed the historic context. The project was placed in its natural setting by Paul Heinrich; David Beard developed archeological expectations for the area. Shirley Rambeau and David Courington prepared the graphic materials for inclusion in the report. Dr. R. Christopher Goodwin and Martha R. Williams edited the report; Christine Herman and Ann Fleetwood produced it.

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CHAPTER I

INTRODUCTION

This report documents the results of Phase I submerged cultural resources survey of Red Eye Crossing M-224 AHP, East Baton Rouge Parish, Louisiana (Figure 1). The project area extends from M-223.3 to 224 AHP, along Conrad Point, and from the Low Water Reference Plane (LWRP) to the edge of the navigation channel. This study was undertaken on behalf of the U.S. Army Engineers, New Orleans District, in support of the proposed construction of a series of soft dike structures on the riverbed outside of the main navigation channel. The dikes are intended to concentrate the flow of the current within the channel, in order to maintain a minimum channel depth of 14 m (45 ft). Six dikes perpendicular to the left descending bank, ranging in length from 198 to 533 m (650 to 1,750 ft), are proposed for construction.

In keeping with the New Orleans District's mission to preserve, document, and protect significant cultural resources, magnetic and acoustic remote sensing surveys were undertaken to locate potential archeological remains. All archeological investigations were accomplished in full compliance with the National Historic Preservation Act (NHPA) of 1966, as amended; with 36 CFR 800, "Protection of Historic Properties;" with the Abandoned Shipwreck Act of 1987 (43 U.S.C. 2101-2106); with Abandoned Shipwreck Guidelines, National Park Service; and with National Register Bulletin Nos. 14, 16, and 20; and, 36 CFR 66.

Conrad Point has a rich history associated with Louisiana's antebellum period. As the setting for Cottage Plantation, now in ruin, it was home to the successful and influential Conrad dynasty, many of whose scions figured prominently in Louisiana history and politics. As the site of a successful plantation, the area was frequented by riverboat traffic calling at its landing for sugar, cotton, and passengers. It also was the scene of one of the greatest tragedies of the era of steamboating, the explosion and burning of the packet *Princess*, in which 70 people lost their lives. The probable remains of that vessel, designated Site 16EBR97, were located as a result of this study. Details concerning the loss and tentative identification of the *Princess* are recorded within this report.

Organization of the Report

This report places the project area within its natural and historical contexts and seeks to examine the findings of the field investigations within those contexts. The natural setting of the project area is discussed in Chapter II. Chapter III places the project area within its historic context, and examines the archeological potential of the area. Chapter IV examines the potential for identifying significant cultural resources in the project area. Details concerning the instrumentation and methods employed during survey are described in Chapter V. Finally, the results of the survey and recommendations to avoid impact to a cluster of anomalies thought to represent the remains of the sidewheel steam packet *Princess*, a potentially significant cultural resource within the project area, are presented in Chapter VI. Recommendations are to assess the potential significance of this site once the structures are in place.

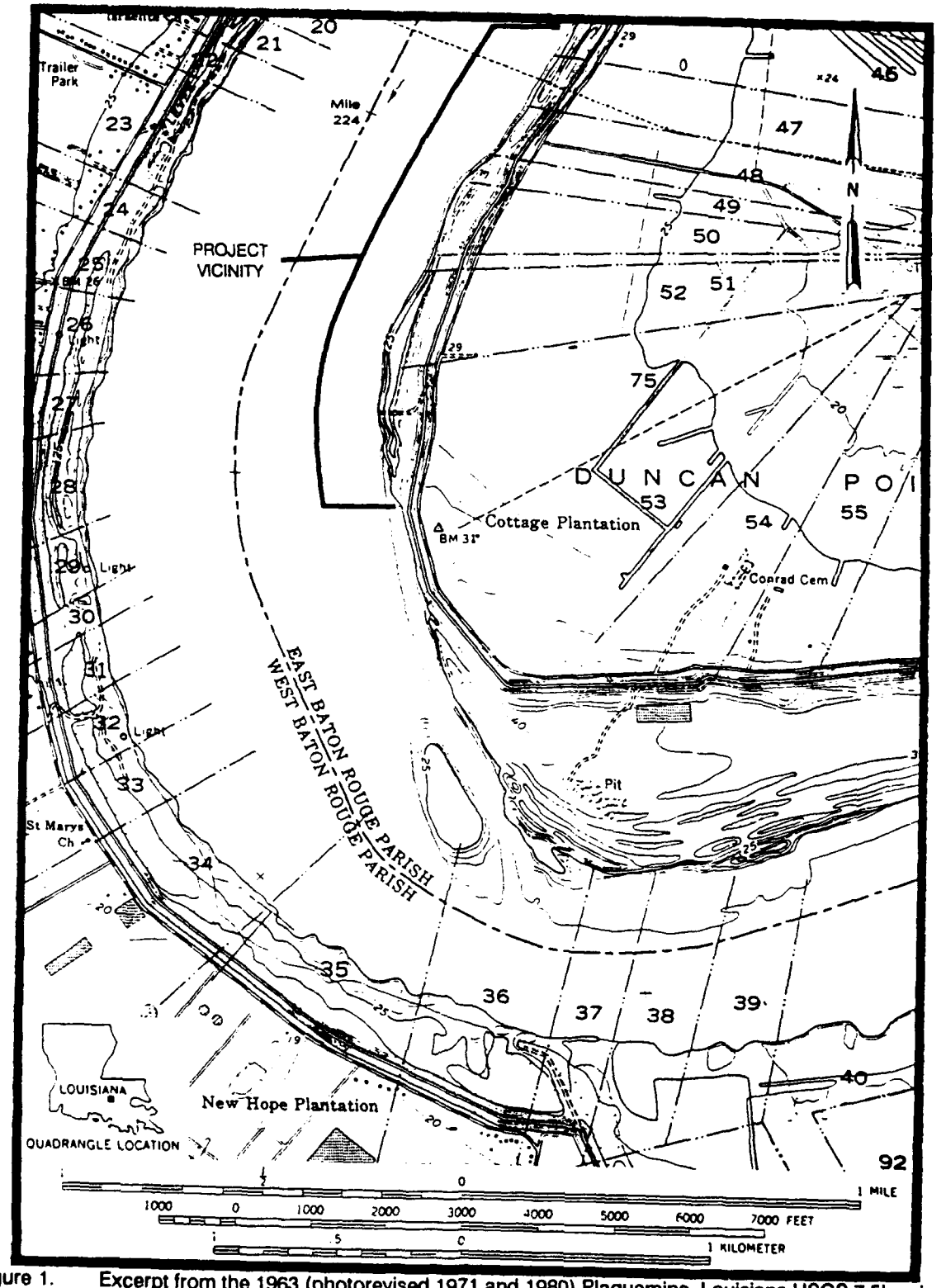


Figure 1. Excerpt from the 1963 (photorevised 1971 and 1980) Plaquemine, Louisiana USGS 7.5' series topographic quadrangle, showing the project area.

CHAPTER II

NATURAL SETTING

This chapter reviews the natural setting of the Red Eye Crossing project area. It includes a discussion of the natural and anthropomorphic processes that influenced the development of the project area and contains an explanation of how such processes affect the distribution and preservation of archeological deposits throughout the area. In addition, a description of the natural setting of the project area is included for review.

Geologic History

The modern Mississippi Alluvial Valley is the result of a complex series of repeated periods of fluvial entrenchment and deposition that occurred during the Late Pleistocene Epoch, i.e., from 1.8 million to 10,000 radiometric years Before Present (B.P.). The terraces found adjacent to the tributaries of the Mississippi River demonstrate that the Mississippi Alluvial Valley and its associated tributaries were established by at least the Early Pleistocene. During the Pleistocene Epoch, the Mississippi River both deepened and widened its alluvial valley through repeated entrenching and filling. Because the entrenched valley shifted laterally during each period of downcutting, the Mississippi Alluvial Valley has widened significantly with time, and in most areas, it has reached its maximum extent (Autin et al. 1991:554-555).

Wisconsinan Stage

During the Wisconsinan Stage, i.e., from 35,000 to 10,000 radiometric years B.P., sea level fluctuated by tens of meters below modern levels. The lowest sea level stand occurred between approximately 22,000 and 17,500 radiocarbon years B.P., when sea level dropped to as low as 100 m (330 ft) below current mean sea level. This low stand caused the Mississippi River to entrench its valley at least as far north as near Baton Rouge. During this time, the floodplain consisted of extensive braidplains formed by braided streams that carried large quantities of glacial outwash (Saucier 1981:14-16; Saucier and Smith 1986:739; Schumm and Brakenridge 1987:236).

Saucier (1981) and Saucier and Smith (1986) hypothesize that the Mississippi Alluvial Valley never was cleaned completely of sediment during this low sea level stand, as illustrated by Fisk (1944). Rather, they suggest that it always was filled partially with a thick sequence of glacial outwash composed of fluvial sands and gravels. In addition, they suggest that the erosional unconformity that forms the base of the Mississippi Alluvial Valley originated not as the result of the formation of a dendritic stream network, but through coalesced channel scouring (Schumm and Brakenridge 1987:236).

Saucier (1981) suggests that the Mississippi River slowly filled its alluvial valley and created a series of discrete floodplain surfaces, each of which remained stable for hundreds of years, i.e., between 12,000 and 7000 radiocarbon years B.P. This suggests that the surface dating from approximately 12,000 radiocarbon years B.P. would lie at shallow depths beneath the surface of the modern alluvial plain. Near Baton Rouge and the project area, this surface would lie approximately 25 m (82 ft) below the modern alluvial plain.

Holocene Epoch

The Mississippi River has occupied at least five different meander belts during the Holocene Epoch. Saucier (1974, 1981:16) and Saucier and Snead (1989) illustrate both the distribution of the remaining remnants of these meander belts and their reconstructed courses. Although Autin et al. (1991:562) and Saucier (1981:16) provide details concerning the currently accepted chronology of these meander belts, much of the Late Wisconsinan and Early and Middle Holocene history of the Mississippi Alluvial Valley remains conjectural and poorly understood.

Before 4800 radiocarbon years B.P., the meander belts of the Mississippi lay along the western wall of the Mississippi Alluvial Valley (Saucier 1981:16). At this time, a poorly developed backswamp drainage network probably occupied the project area. By 4800 radiocarbon years B.P., backswamp sedimentation had buried completely the terminal Wisconsinan braidplains and an unnamed meander belt of the Mississippi River. Saucier (1969) illustrates possible fragments of this unnamed meander belt adjacent to Meander Belt No. 1 within West Baton Rouge and Iberville parishes (Saucier 1974, 1981).

At about 4800 radiocarbon years B.P., a channel avulsion established the present course of the Mississippi River within what would become Meander Belt No. 2. The channel created by this avulsion slowly extended along the eastern valley wall of the Mississippi Alluvial Valley. Initially, a nonmeandering channel incised its thalweg into the underlying backswamp deposits and built a low, confining levee over the next few hundred years. As its discharge increased, the Mississippi River began to deepen and widen its channel within the underlying fluvial sediments and to aggrade its natural levees. Eventually, this course developed incipient meander loops as demonstrated by the small twists and turns found within its channel. When the full flow of the Mississippi River was diverted into Meander Belt No. 2, its course developed mature natural levees and meander loops. Even when diversions upstream created Meander Belt No. 1, the Mississippi River continued to occupy this portion of the river course (Farrell 1989:159-164).

Because the top of the surface formed by the Pleistocene braided stream deposits is shallower than the 30 to 40 m (100 to 131 ft) depth of cutbank and channel erosion, the development of Meander Belt No.1 would have destroyed any preexisting fluvial and prehistoric archeological deposits within this area. Late Wisconsinan and Early Holocene sediments and their associated archeological deposits would be preserved only beneath the backswamps that lie east and west of Meander Belt No. 1 (Saucier 1981:10).

Eventually, this segment of the Mississippi River developed mature, high, confining natural levees. Because they were high and confining, the deposition of sediments on the natural levee was restricted to the concave side of the meander loop. The height of the levees also prevented floodwaters from uniformly overflowing and submerging the entire levee. As a result, the adjacent backswamp could be flooded only through low areas, or crevasses, cut by flood waters through the natural levees. Because flooding occurred through crevasses rather than uniformly over the crest of the natural levee, most of the natural levee was not inundated during a typical annual flood (Farrell 1989:164).

Furthermore, the back and forth lateral migration of the Mississippi River has reworked completely the alluvial plain within the project area. As the river course migrated, its cutbank removed the upper 30 to 40 m (100 to 131 ft) of its alluvial plain, while a similar thickness of point bar deposits accumulated on its convex bank. As a result, backswamp, meandering river, and braided stream sediments older than 4,800 years have been removed completely and backfilled with younger sediments to form the modern surface of Meander Belt No. 1. The narrow width of the Mississippi River meander belt within the project area suggests that the lateral migration of the Mississippi River has reworked the area completely during the last 2,800 years. Therefore, it is presumed tha all of the meander belt surfaces and deposits within the project area belong to Meander Belt No. 1. Although it is possible that currently unmappable and undetectable fragments of Meander Belt No. 2 exist within Meander Belt No. 1.

Geomorphology and Geology of the Project Area

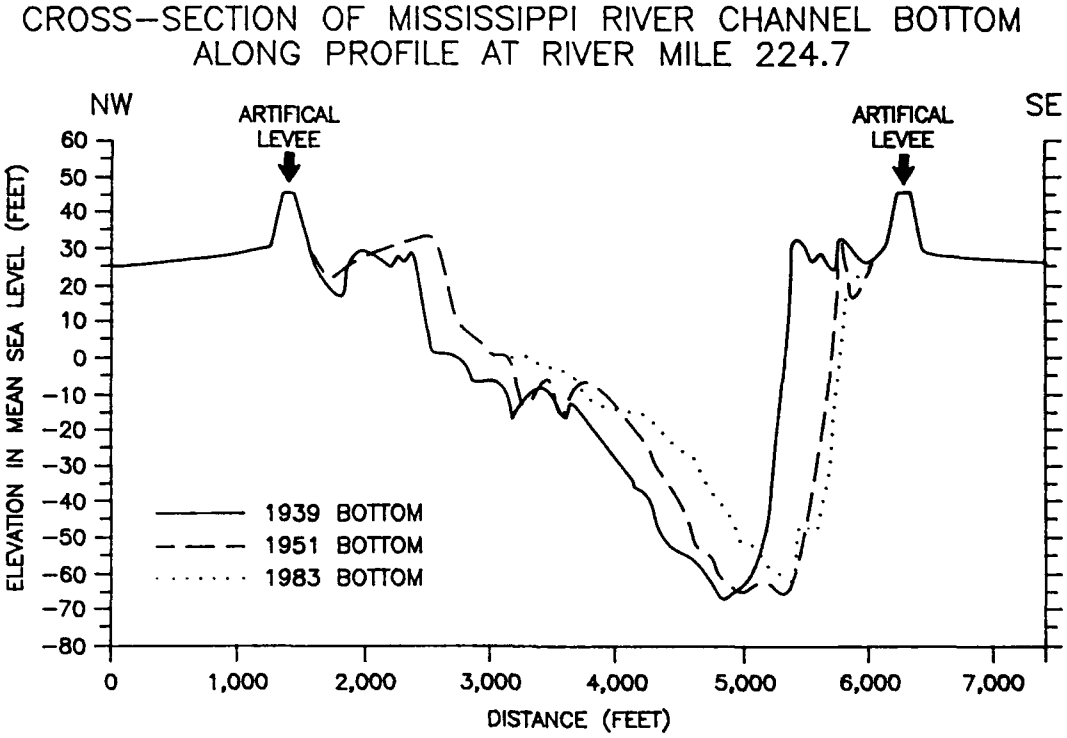
The project area lies entirely within the Mississippi Alluvial Valley, as defined by Fenneman (1938). Within this physiographic region, the project area lies entirely within Meander Belt No. 1 as defined by Autin et al. (1991). Of the five recognized Mississippi meander belts created during the Holocene era, Meander Belt No. 1 is not only the youngest but also the only active meander belt (Saucier and Snead 1989). These five meander belts represent geomorphic surfaces that consist of the deposits and constructional landforms created by a meandering river occupying a single course. An individual meander belt consists of an assemblage of related constructional landforms. These include point bars, natural levees, crevasses, and abandoned meander loops (Saucier 1974:10-11). Within the project area, Meander Belt No. 1 consists of a fully developed narrow meander belt that ranges in width from 2.5 to 6.6 km (1.2 to 4.0 mi). These meander belt deposits are restricted to the areas enclosed by the modern meander loops.

Narrow natural levees border the modern channel of the Mississippi River. The crests of the natural levees rise as much as 8.5 m (28 ft) in elevation above mean sea level, and they are highest in areas located adjacent to the Mississippi River Channel. The natural levees slope gently away and extend as far as 1.5 to 2.0 km (0.9 to 1.2 mi) back from the channel margin. Artificial levees with elevations of just over 14 m (45 ft) have raised the elevation of these natural levees considerably. Adjacent to the northernmost portion of the project area, the natural levees exhibit very narrow and shallow swales that are oriented perpendicular to the channel margin. These swales apparently are associated with historic crevasse deposits. The construction of artificial levees has created a narrow batture ranging from 90 to 150 m (295 to 492 ft) in width. These battures have been disturbed heavily by prior construction and the excavation of borrow pits (Jones et al. 1992;Saucier 1969; U.S. Geological Survey 1971).

Compared to the upstream reaches of the Mississippi River where well-developed meander belts are common, the reach of the Mississippi River, as defined by the limits of the project area, has a narrow, almost discontinuous meander belt. This can be attributed to two factors. First, the restricted meander belt reflects the geologically short length of time during which the Mississippi River has developed point bars within this reach. Second, channel migration within this part of the Mississippi River is limited by 27 to 30 m (90 to 100 ft) of cohesive backswamp deposits that underlie the backswamps to either side of this meander belt. As a result, the Mississippi River meanders freely, migrating back and forth within the sandy point bar sediments that comprise the meander belt; however, the tough backswamp clays form a natural revetment that greatly limits the rate at which the channel can migrate and thereby increase the width of the meander belt (Kolb 1962).

The project area consists of the eastern left descending portion of the Mississippi River channel, between M-224.7 and 223.3. From M-224.7 to 223.8, the thalweg, or the deepest part of the river channel, lies adjacent to the bankline near the northern edge of Duncan Point. The center of the thalweg lies between 90 and 150 m (295 to 492 ft) off the left descending bankline, and at a depth of over 18 m (60 ft) below mean sea level.

Within this segment of the river channel, the project area contains a cutbank that rises sharply from the center of the thalweg to the bankline. The cutbank is defined as the concave erosional bank of a meandering stream or river that is maintained as either a steep or, often, overhanging cliff by channel scour at its base. A projection depicted on the 1983 cutbank profile probably represents a large sand ridge (Figure 2). To the northwest of the center of the thalweg, the channel bottom rises sharply, and then gradually flattens out to the bankline of the right descending bank. The thalweg of the Mississippi River migrates from the left descending bank at M-223.8, and crosses the river channel to the right descending bank at M-222.5. Immediately downstream of that position, the thalweg lies adjacent to the bankline and forms the cutbank of Missouri Bend (Mississippi River Commission 1983).



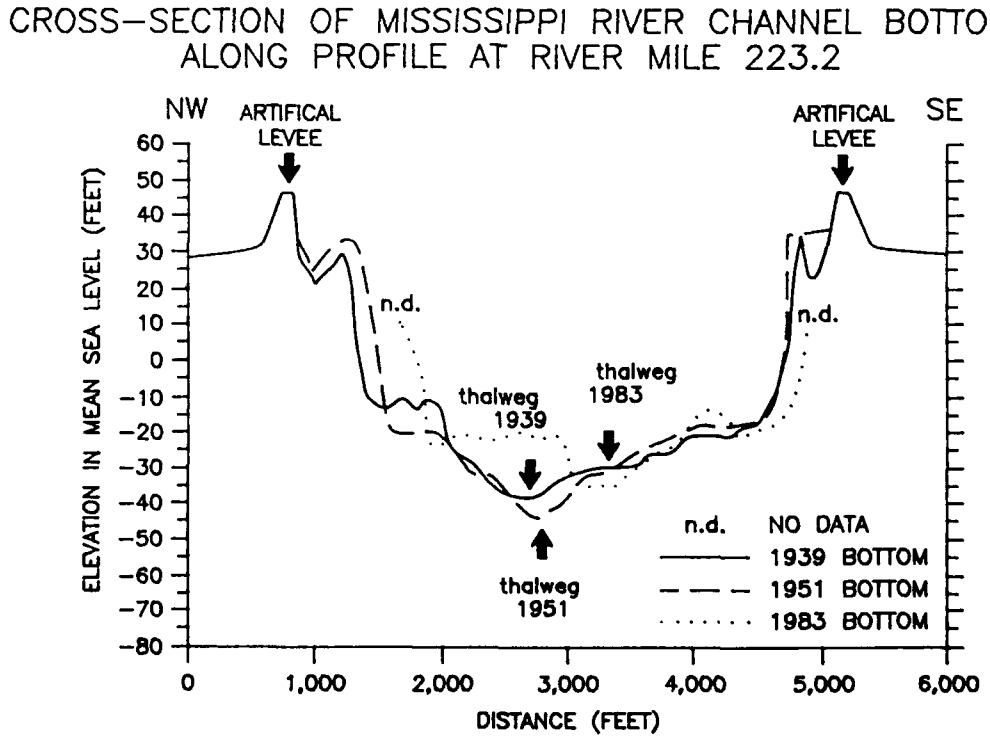


Figure 2. Bottom and batture profiles of the Mississippi River at River Miles 223.2 and 224.7 for 1939, 1951, and 1983.

At M-223.2, the thalweg lies directly within the middle of the Mississippi River channel (Figure 2). The thalweg at this point of the river channel is about 11.3 m (37 ft) deep. The bottom of the river channel slopes gradually into the thalweg from the bankline of both banks. As the distance from the left descending bank to the thalweg increases downstream, the channel bottom within the project area becomes progressively shallower.

Additional data concerning the dynamics of Mississippi River meander belts can be obtained from the numerous studies involving the geomorphology and sedimentology of Mississippi River meander belts. For example, the appearance, depositional environment, occurrence, character, and sediments of meander belt surfaces and their landforms are summarized by Saucier (1969). In addition, Walker and Cant (1984) and Flores et al. (1985) provide comprehensive reviews of the sedimentology and geomorphology of meander belts. Fisk (1947) and Gagliano and Howard (1984) also explain Mississippi River processes, such as cutoffs and lateral accretion, and Farrell (1989) identifies the internal structure and formation of natural levees that form a significant part of the geomorphology of the project area. Finally, Davies (1966) describes the character and depositional environment of the silts and fine-grained sands that comprise upper point bar deposits within the project area.

Stratigraphy

Meander Belt No. 1 is a geomorphic surface that forms the upper surface of an unnamed allostratigraphic unit informally called a "fluvial complex." A single depositional sequence of point bar and overbank sediments form Meander Belt No. 1. Former cutbanks of the outermost channels of the meander belt form the lateral boundaries of the sedimentary sequence deposited by the migrating channel and of this fluvial complex. The basal discontinuity of this fluvial complex is an erosional unconformity cut into the underlying fluvial deposits by the bottom of the thalweg as it migrates back and forth across the Mississippi Alluvial Valley. It is defined as an allostratigraphic unit because the depositional sequence is bounded by regionally persistent and mappable bounding discontinuities (North American Commission on Stratigraphic Nomenclature 1983:865-866).

The depositional sequence of fluvial sediments of Meander Belt No. 1 are typical of those produced by a laterally migrating mixed-load meandering river. Adjacent to the left descending bank of the modern channel, this depositional sequence consists of 6 to 9 m (20 to 30 ft) of natural levee deposits overlying 3 to 7.6 m (9 to 25 ft) of upper point deposits composed of fine-grained silty sands, and silts. These upper point deposits grade downward into lower point bar deposits composed of clean sands and gravels. The base of the lower point bar sands is uncertain, but it probably lies somewhere between 30 to 43 m (100 to 140 ft) below sea level. The natural levee sediments typically consist of stiff to very stiff, mottled brown to grayish brown silts, silt loams, silty clays, and clays (Saucier 1969, 1974:6-7).

Historical River Channel Changes within the Project Area

Significant lateral migration of the Mississippi River channel has occurred throughout parts of the project area. Within the northern portion of the project area, between M-224.7 and 224.0, the cutbank of the Mississippi River has migrated to the southeast during historic times (Mississippi River Commission Hydrographic Survey 1983-1985 [Sheet 27]). Between 1880 and 1921, the bankline within the project area remained stable and, in fact, moved slightly northwest into the channel. Between 1921 and 1983, the bankline migrated as much as 335 m (1,100 ft) to M-244.7. Between 1880 and 1983, the lateral migration of the channel north of the project area has been continuous and of greater magnitude than the cutbank migration found in other parts of the project area. Thus, a triangular portion of the northernmost portion of the project area consists of a river channel that once was dry land that formed part of Duncan Point prior

to 1921. The migrating cutbank has eroded this area to depths approaching 18 m (60 ft) below mean sea level (Jones et al. 1992:37).

Minor changes have occurred within the bankline in the central and southern portions of the project area, i.e., between M-224.0 to 223.3. Between 1880 and 1921, the bankline eroded slightly back into Duncan Point. Between 1921 and 1939, the bankline moved back to or very close to the 1880 position (Jones et al. 1992:37). As a result, the project area between M-224.0 and 223.3 has been part of the river channel since 1880, when it first was mapped accurately by the Mississippi River Commission. To the south of the project area, the 1983 bankline lies southeast of its 1921 and 1939 positions (Figure 2). Examination of various Mississippi River Commission charts (1939, 1951, and 1983) indicate that few changes in the bathymetry of the channel bottom have occurred within the project area between 1939 and 1983 (Figure 2).

Geoarcheology

Fluvial processes strongly influence the formation, preservation, and occurrence of archeological deposits. For example, the accumulation of the sediments that form the natural levees along the banks of the Mississippi River is conducive to the formation and preservation of buried archeological deposits. However, the lateral migration of the river channel can destroy the alluvial and archeological deposits that these soils might contain. While archeological deposits lie on or near the surface of the Mississippi River natural levee, pedogenic and fluvial processes can modify them significantly.

The vertical aggradation of natural levee deposits is the main process by which archeological deposits are preserved within an alluvial setting. As noted in the discussion of the geological history of the project area, the rate of deposition within a natural levee is greatest during the Avulsion and Early Meander Belt Stages of meander belt growth as defined by Farrell (1989:161-163). During both stages, floodwaters uniformly overflow the natural levee and deposit sediment as an even blanket across both sides of the channel. This rapid sedimentation precludes long-time exposure and, thus, extensive weathering of any archeological deposits that accumulated on the natural levee prior to this time. The rapid sedimentation rate also increases the chance that individual occupations within a single archeological deposit will be separated into individual components rather than being mixed into a single assemblage (Ferring 1986). Because little lateral migration occurs at this stage, the majority of the archeological deposits created during this period will be preserved as buried sites.

Fluvial processes also bias the location of sites not destroyed by lateral migration during the Fully-Developed Meander Belt Stage (Farrell 1989) by contemporaneous burial in two ways. As the Mississippi River channel actively migrates away from archeological deposits along a point bar, overbank sedimentation buries these archeological deposits quickly. As a result, point bar archeological deposits, although they are preserved by their location on an accreting point bar, will not appear in the archeological record as surface sites. Secondly, if a Mississippi River cutbank were to migrate up to and stop at a pre-existing archeological deposit on a natural levee, that deposit already would be buried beneath the natural levee deposits. The aggradation of overbank deposits on both natural levees and point bars quickly hides older archeological deposits that might survive cutbank erosion. As a result, only those archeological deposits that predate to within a few decades and that postdate the abandonment of the channel will occur as surface sites (Goodwin et al. 1991; Heinrich 1991).

Therefore, an active, laterally migrating channel buries archeological deposits on its point bars and natural levees and consumes them with its cutbank. As a result, the active lateral migration of a Mississippi River channel either will bury or destroy in a short period of time those archeological deposits that predate the abandonment of a river channel or course segment on its natural levee. Sedimentological processes can therefore bias the distribution of surficial archeological deposits relative to their age (Goodwin et al. 1991; Heinrich 1991).

Overbank processes also directly affect the preservation of archeological deposits within a fluvial system. The vertical aggradation that builds the natural levees and fills the backswamps and abandoned channels also preserves the archeological deposits that occur within these environments. However, the continually wet, swampy, or poorly drained nature of the backswamp and channel environments discourages the accumulation of most archeological deposits. Because the lateral accretion of point bar deposits occurs within the river channel, point bars lack *in situ* archeological deposits, except for historic shipwrecks (Goodwin et al. 1991).

The Project Area

Within the project area, the lateral migration of the bankline severely limits the potential for encountering of in situ terrestrial archeological deposits. In the northern part of the project area, the progressive eastward movement of the bankline since 1879 has cut back the bankline from between 335 m (1,100 ft) at M-224.7 to approximately 46 m (150 ft) at M-224.2 (Figure 2). Any archeological deposits present, except possibly for shipwrecks with intact, structurally strong hulls, would have been destroyed along the natural levees in which they resided. In addition, changes in water level, and wave wash from river traffic constantly erode and rework the natural levee sediments and their enclosed archeological deposits to a depth of about 6 m (20 ft) (Goodwin et al. 1991; Jones et al. 1992:32), thus compromising the integrity of the archeological record even further.

In the remainder of the project area, no significant net loss or gain of bankline has occurred since about 1880 (Jones et al. 1992). Water level changes and wave wash from river traffic likely have caused some short-term erosion and redeposition of sediments and, thus, have severely damaged archeological deposits within the bottom and along the bankline of the project area. Because little if any change has occurred in the bathymetry of the project area south of M-233.8, shipwrecks in this portion of the survey very likely lack any significant cover of fluvial sediments and probably have been exposed to damage by fluvial and cultural processes. For the same reason, it is very unlikely that buried archeological deposits will occur within this portion of the project area.

Active fluvial processes within the adjacent batture also greatly influence the preservation of archeological deposits. Since the construction of artificial levees, significant historic overbank sedimentation and erosion has been documented within the battures along the Lower Mississippi River. As a result, historical archeological deposits within the batture adjacent to the project area may have been buried as deeply as 0.6 to 1.2 m (2 to 4 ft), and may possibly have been reworked during periods of erosion (Jones et al. 1992:35-38).

Moreover, archeological deposits within the floodplain of the batture are prone to disturbance by burrowing animals, tree falls, and pedogenic processes. The slightly acid A and AC horizons of the Mhoon Series are unfavorable for the long-term preservation of cultural materials such as bone, shell, and metal. The periodic flooding of the floodplain and the rainfall within this poorly drained area induce a repeating wet to dry cycle within the alluvial sediments that accelerates the decay of archeological materials such as bone, shell, metal, charcoal, and ceramics (Mathewson 1992:230-232).

Human activities within the batture have affected archeological deposits greatly. For example, the preparation of foundations for man-made levees and the excavation of fill have very likely impacted all archeological deposits located in that immediate area. The deep, laterally continuous borrow pits that cut into the batture during the construction of the artificial levees probably resulted in the destruction of archeological deposits located within the area. Silt mining, the construction of various structures, and the dumping of refuse and fill also has disturbed the batture severely (Goodwin et al. 1991; Jones et al. 1992:32; U.S. Geological Survey 1971).

Climate

Summers are long, hot and humid within this portion of the Mississippi Alluvial Valley. Because of the dominance by warm, moist maritime air masses originating from the Gulf of Mexico, this weather typically lasts from May through September. According to records at Baton Rouge Municipal Airport for the period 1931 to 1960, July and August are the hottest summer months, with an average daily maximum temperature of 91° F and an average daily minimum temperature of 72° F. Thunderstorms are the primary cause of precipitation during the summer. Precipitation occurs either as brief heavy showers or as gentle rains. June is the second driest month of the year, with an average monthly precipitation rate of 10.4 cm (4.1 in). During late summer, infrequent tropical storms and hurricanes are a source of heavy rain and gentle showers (Dance et al. 1968; Schumacher et al. 1988).

Fall generally lasts from late September to early November. Typical fall weather consists of humid, mild, and sunny days interrupted by infrequent cold fronts. Each cold front brings a brief spell of cooler and drier weather. During the fall, precipitation results both from the infrequent squall lines associated with fronts, and from the occasional tropical storm or hurricane. October is the driest month of the year, with an average monthly precipitation rate of 6.4 cm (2.5 in) (Dance et al. 1968; Schumacher et al. 1988).

Winter generally lasts from the middle of November to the end of February. Winters usually are mild, with an average of only 16 days each year having a minimum temperature of 32° F or lower. January is the coldest month with an average daily maximum temperature of 63° F and an average daily minimum temperature of 42° F. Typically, moist tropical air from the south alternates with dry, polar air from the north. Extremely cold weather seldom lasts more than three to four days in a row. During the winter, precipitation is associated with cold fronts. Infrequently, these fronts will stall in the Baton Rouge area and will cause prolonged rains. Snow is uncommon; an inch or two may fall in some years during February (Dance et al. 1968; Schumacher et al. 1988).

Spring generally lasts from the end of February to the beginning of May. During this period, the frequency and duration of incoming cold fronts decreases sharply. Rainfall during the spring is associated with cold and warm fronts. The monthly average rainfall is a relatively constant 12.1 cm (4.8 in) for each spring month (Dance et al. 1968).

CHAPTER III

CULTURAL BACKGROUND

Historic Overview

Introduction

The Red Eye Crossing project area is located on the Mississippi River at Duncan, or Conrad's, Point in East Baton Rouge Parish. The area encompasses a bend in the river fronting two former sugar plantations, Laurel Place and Cottage Plantation. These properties have been agricultural, from the original French concession during the early eighteenth century to the present time. This chapter first presents a general historic overview of the region, with emphasis on ownership and land usage in this project area.

Early Exploration

Spain was the first European country to claim the Louisiana region. Sources disagree whether Alonso Alvarez de Piñeda in 1519, or survivors of the Pánfilo de Narváez expedition in October 1528, first discovered the mouth of the Mississippi River. Historians generally agree, however, that Hernando de Soto was the first to explore the Louisiana interior. De Soto led his expedition across southeastern America, crossing the Mississippi River near the present Tennessee/Mississippi state border in spring of 1541. From that point, the explorers traveled westward, possibly as far as Oklahoma, before returning to the Mississippi, where De Soto died somewhere along the river between Memphis and Baton Rouge in May 1542. The survivors of the expedition unsuccessfully attempted an overland route through Texas to the Spanish settlements in Mexico before finally returning to the Mississippi for the journey downriver. The group then traveled across the Gulf of Mexico to Vera Cruz, reaching that destination in September 1543. Following these disastrous expeditions, the Spanish took no further action to strengthen their claim to the lower Mississippi Valley for nearly 140 years (Davis 1971:27-28; McLemore 1973:1:91-100).

A French expedition under the leadership of Réné Robert Cavalier, Sieur de la Salle, was next to explore the lower Mississippi. La Salle traveled down the Mississippi River, beginning at its confluence with the Illinois, and reached its mouth in early April 1682. With assurances from the Indian tribes encountered along the journey that the group was "the first Europeans who have descended or ascended the River Colbert [Mississippi]," La Salle claimed all lands drained by the great river for Louis XIV, King of France, on April 9, 1682 (Davis 1971:28-29; French 1875:17-27).

Colonial Era

French Colonial Period. In 1698, Pierre Le Moyne, Sieur d'Iberville, was sent by Louis XIV to explore the lower Mississippi River and to establish a French colony in Louisiana. The Iberville party entered the mouth of the Mississippi on March 2, 1699, and then journeyed upstream, apparently as far as the mouth of the Red River. Along the ascent, the Frenchmen passed the *baton rouge* [red stick] marking the boundary between the Bayougoula and Houma territories (Davis 1971:40; Meyers 1976:3-9). Iberville described the future site of the Louisiana state capital in his journal entry of March 17, 1699: "Upon its banks are huts covered with palmetto leaves and a reddened Maypole without branches with several heads of fish and bears attached in sacrifice" (Meyers 1976:6).

On the return trip downriver, Iberville and his men were directed by the chief of the Bayougoulas to the Ascantia, known to the Indians as a shorter passage to the Gulf of Mexico. This route took the Iberville party through the waterways known today as Bayou Manchac, the Amite River, Lake Maurepas, Pass Manchac, Lake Pontchartrain, and Lake Borgne. Iberville immediately rechristened the Ascantia, which linked the Mississippi River and Lake Manchac, the *Rivière d'Iberville*, the name by which it was known until the mid-nineteenth century (Figure 3) (Davis 1971:40).

Iberville established Fort Maurepas on Biloxi Bay, east of the Pearl River, in 1699. Shortly thereafter, the French government began to grant land concessions along the Mississippi River. The project area apparently was included within the Dartaguette, or Diron, family concession, which encompassed the area later known as the Manchac District (Gagliano et al. 1977:23). This grant was developed by Captain Bernard Diron Dartaguette, younger brother of French government official Jean-Baptiste Martin Dartaguette, who was one of the original directors of the Company of the West. The Dartaguette concession, called Dirombourg (also spelled Dironbourg) or Baton Rouge by Captain Dartaguette, was described in 1718 as "*tres bien placee* with '2 whites and 25 negroes'" (Conrad 1988:1:213; Meyers 1976:10-13). By 1721, Captain Diron Dartaguette had been appointed as Inspector General of the Troops and Militia for the Province of Louisiana; in an addendum [1722] to his report that year [1721] to the administrator of the Louisiana colony for the Company of the Indies, he stated:

> The concession of M. Dyron [sic] is located at Baton Rouge forty leagues above New Orleans. The land there is very fine and good and there are many prairies. Half of this concession is burned over. They have tried to increase the fields. Last year rice and vegetables were harvested. There are in this concession about thirty whites and twenty negroes and two Indian slaves (Ditchy 1930:223).

Although the census report sounded optimistic, the Inspector General also noted:

> . . . the greatest misfortune of the colony came from not having had vessels enter this [Mississippi] river to bring there all the colonists that have been sent to Louisiana . . . . More than half of the workingmen and the *engagés* [people brought from France under service contracts] of the concession perished because of the long stay they had to make on a barren coast and through hunger and lack of aid during sickness, almost all their goods were used up or sold whereas if as soon as they arrived they had been sent up the river in the boats in which they had come, these poor people would have been safe and the concessions or plantations would have been established in the first place along the river and the goods would have served to improve the plantations which would be at present able to repay the proprietors for the great expense they incurred in contributing to the establishment of the Colony (Ditchy 1930:227).

The authorities apparently did not listen to the Inspector General's suggestion for colonization along the Mississippi, nor did Bernard Diron Dartaguette remain in the area. Within a decade of its establishment, the Dartaguette concession had been abandoned. Father Paul du Poisson camped at Baton Rouge on June 4, 1727, and found only "the remains of a French habitation, abandoned on account of wild animals -- deer, rabbits, wild cats and bears -- that had laid waste everything" (Meyers 1976:16). The sparse population of the region, and the absence of protection for those few settlers, no doubt also contributed to the demise

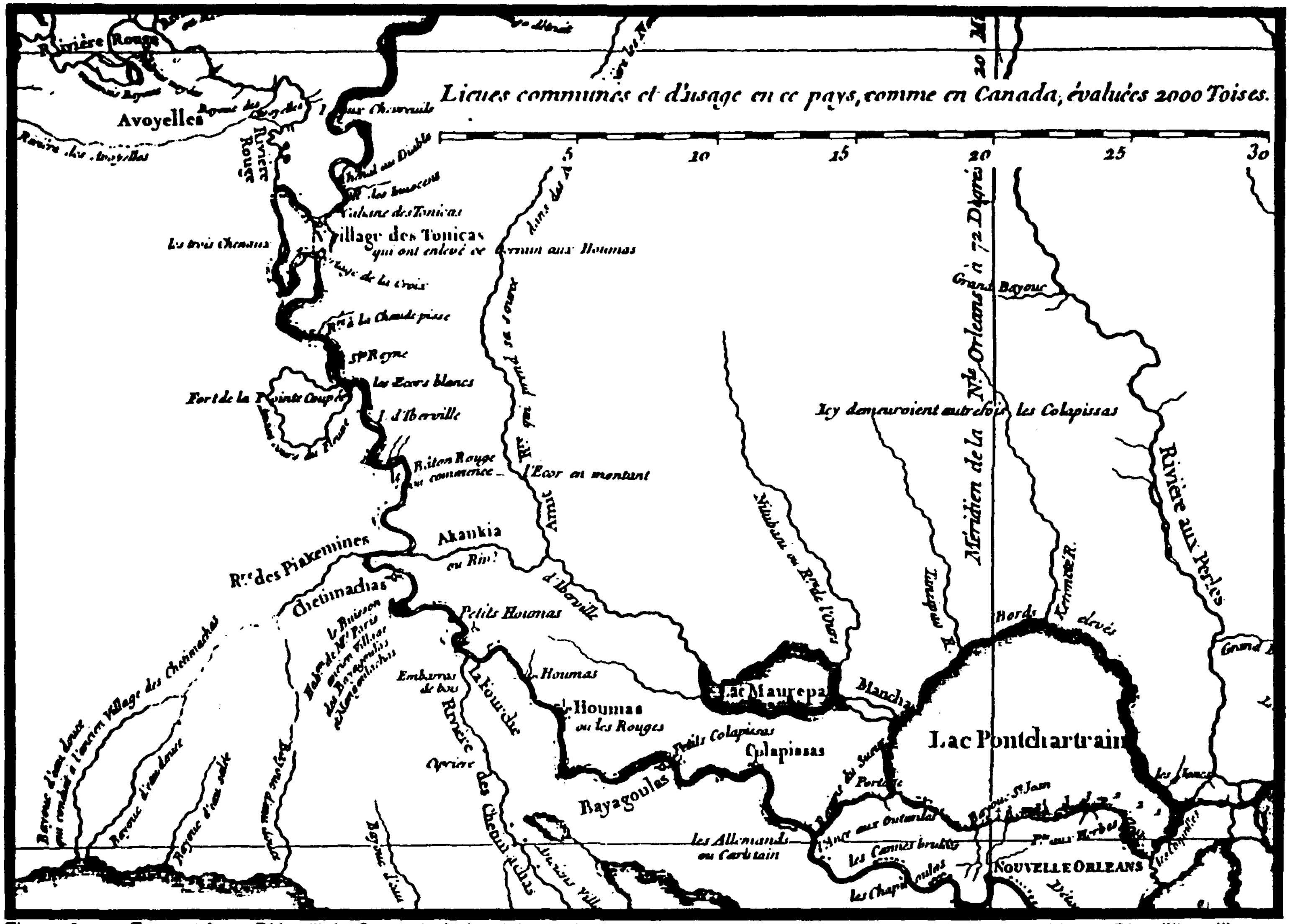


Figure 3. Excerpt from D'Anville's *Carte de la Louisiane*, drawn in 1732, published in 1752, showing the Akankia, or *Riv. d'Iberville.*

of the settlement. Early maps and records indicated that the fort at Pointe Coupée, upriver and west of Baton Rouge, was the only French military post between Natchez and New Orleans (Casey 1983:161-162; Meyers 1976:16-17). By 1732, Baton Rouge was depicted on the D'Anville map as merely a place "*où commence l'Ecor en montant*" ["where begins a hilly bluff"] (Figure 3).

British West Florida. With the exception of the Isle of Orleans, all French territory east of the Mississippi River was ceded to England at the close of the Seven Years War. The region containing the project area became part of the Manchac District of British West Florida. The colony of West Florida extended from the mouth of the Yazoo River, above Natchez, southward to the Iberville River [Bayou Manchac] and the Gulf of Mexico, and from the Mississippi River eastward to the Appalachicola and Chattahoochee rivers (Figure 4) (Johnson 1971:1, 6-7).

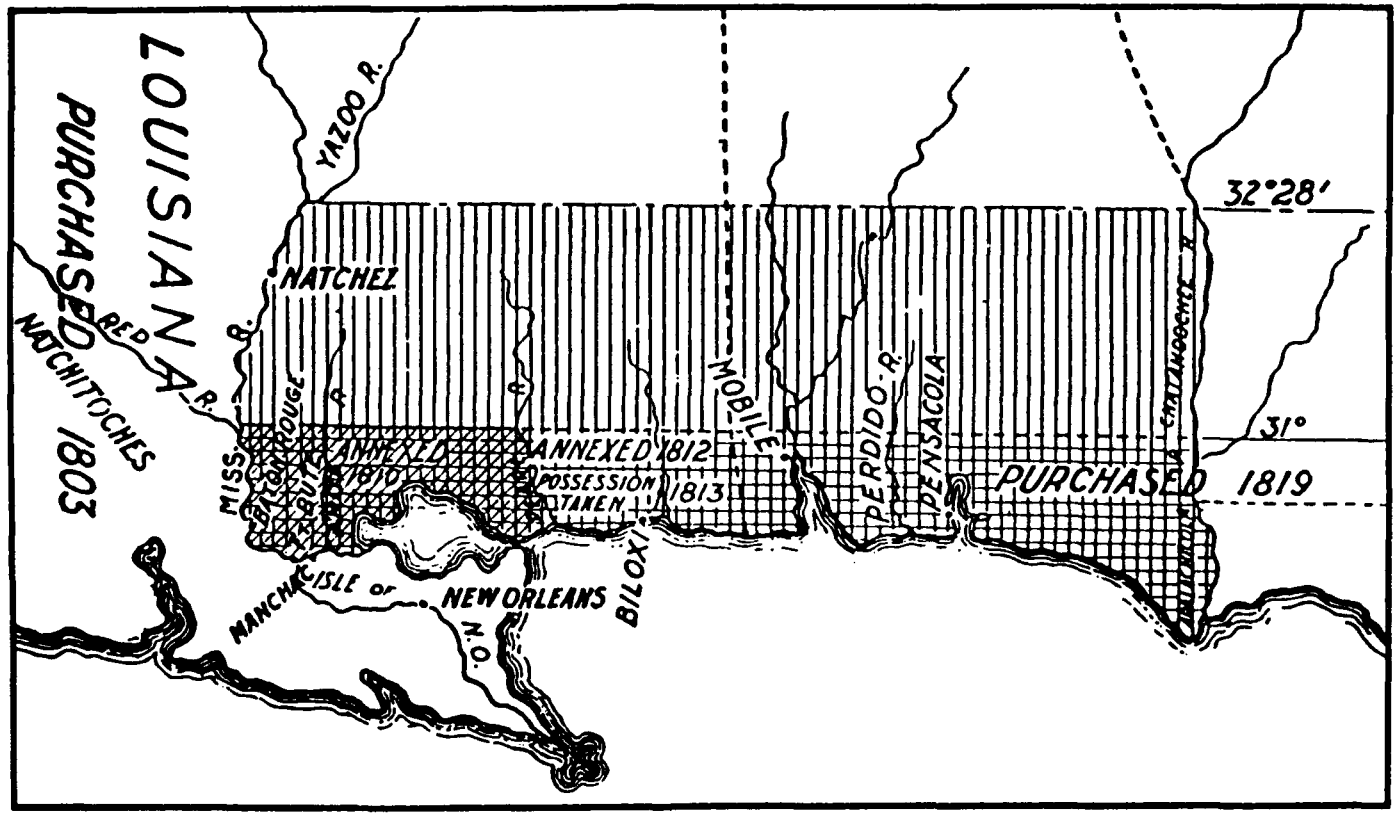
The Iberville route to the Gulf of Mexico was considered critical to English control of Mississippi River commerce, particularly the fur trade. Using this passage, the British could bypass Spanish-held New Orleans, thereby making Pensacola the commercial center of the southeast. Impeding the efficiency of this plan was the fact that the Iberville River [Bayou Manchac] had to be cleared seasonally to permit navigation along its course. One of the reasons for the 1765 construction of Fort Bute at the confluence of the Iberville and Mississippi rivers was to garrison soldiers used to keep the Iberville obstruction-free. The passage was maintained, but it never developed as an important trade route due to the relative lack of commerce at Mobile and Pensacola (Casey 1983:34; Dalrymple 1978:6-7, 31; Johnson 1971:33-36, 67).

Fort Bute also was considered necessary as a frontier defense along the international boundary between British and Spanish possessions. The British thought that a garrisoned fort would encourage settlement in its new colony (Johnson 1971:33-36). Land grants in the region were offered to men who served in the British army and navy during the Seven Years' War and who were "disbanded in America, and . . . actually residing there" (Dart 1930:612; Johnson 1933:547-548). However, the anticipated settlers did not rush to the Manchac District. Political troubles also caused a shift in British focus to the Atlantic seaboard. Military authorities ultimately deemed Fort Bute indefensible against any Spanish threat, and they ordered the post dismantled in September 1768 (Casey 1983:34; Johnson 1971:67).

Emigration to West Florida increased during the mid-1770s, when Britain's "fourteenth American colony" was designated an "asylum for the friends of the king"; financial aid and substantial land grants were offered to those who accepted the proposition (Johnson 1971:149, 205). British West Florida soon became a haven for Loyalists avoiding revolutionary activities in the Atlantic seaboard colonies, and land claims lined virtually all the waterways of the Manchac District by 1779. However, population still remained rather sparse, since several landowners held title to multiple tracts, many of which were left undeveloped by their absentee owners (Goodwin et al. 1990a:21, 23-24; Johnson 1933:551-553).

Landholders within the project vicinity in 1770 -- R. Carpenter, B. Collins, Daniel Clark, Lt. Thomas, and John McIntosh -- all may have been government officials who simply held title to the tracts (Meyers 1976:18). More intensive archival investigation would be required to determine whether or not these owners were assemblyman Richard Carpenter, deputy provost marshal William Collins, receiver-general of quit-rents Daniel Clark, and Indian commissaries and justices of the peace John Thomas and John McIntosh (Johnson 1971:62, 79-80, 91, 94). By 1779, only McIntosh (spelled Macintosh on the 1779 Des Barres map) retained his 5,000-acre tract above the Iberville [Manchac]. The other owners had been replaced by Lewis Cuthbert, Lional Recher-Westrop, Thomas McMin, Montfort Browne, and Benjamin Gower. Browne, the Lieutenant Governor of West Florida, was granted his property (Tract No. 213) in return for service to the British crown at "the Reduction of Louisbourgh and Quebec" during the Seven Years' War; McIntosh had received his tract (No. 250) by royal mandamus (Figure 5) (Des Barres 1779).

The rebellious eastern seaboard colonies made a futile attempt to enlist West Florida in their fight against the mother country. Isolated from the troubles to the east and content with British government, most



BRITISH WEST FLORIDA - Acquired by Great Britain 1763. Boundary of 32° 28' fixed 1767.

SPANISH WEST FLORIDA - Acquired by Spain 1783. Northern Boundary fixed 1795. Pearl-Perdido portion annexed to Mississippi Territory 1812. Possession taken 1813. Perdido-Apalachiola portion acquired by Florida purchase of 1819.

INDEPENDENT STATE OF WEST FLORIDA - Independence won by Revolt. Declared September 26, 1810. Annexed to U.S. by President proclamation, October 27, 1810. Added to State of Louisiana by Act of Congress April 14, 1812.

Figure 4. Map designating British West Florida, Spanish West Florida, and the Independent State of West Florida (Chambers 1898).

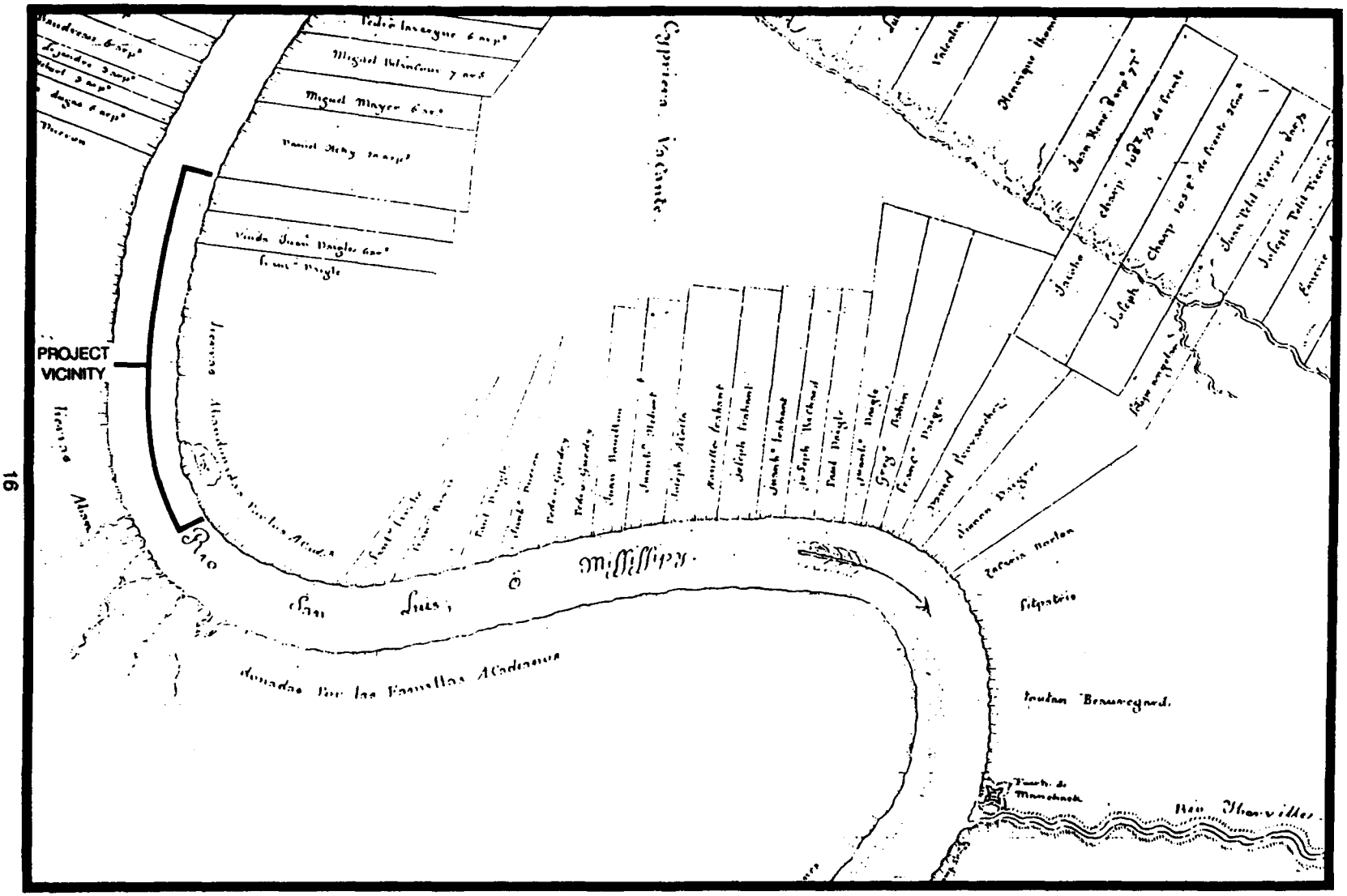


Figure 5. [1779] Excerpt from Joseph Des Barres' *Mississippi River, From Iberville to . . . 1779 Land on the River Mississippi, River Amit, Etc.*, showing British land grant nos. 210-214, and 250 in the project vicinity.

Louisiana colonists remained loyal to the crown. In 1777, the Commerce Committee of the Continental Congress authorized former Natchez resident James Willing to lead a small expedition down the Mississippi River into West Florida. The party's original instructions remain vague; Willing may have been ordered to purchase supplies from the Spanish in New Orleans, to seize Loyalist plantations along the eastern Mississippi, or to secure pledges of neutrality from the West Florida colonists.

Regardless of the intended purpose of the mission, Willing and his men ravaged the British riverfront plantations between Natchez and Manchac (Caughey 1932:5-12; Johnson 1971:205, 208-209). Prominent planter William Dunbar, who owned a plantation near Baton Rouge, reported Willing's raid in his daily journal:

> About the end of February [1778] we were alarmed late of an Evening by a report from Manshac, that a party of Americans had arrived there & taken an armed Merchant Man [the *Rebecca*] that lay there . . . upon this intelligence I instantly determined to send my negroes for protection to the Spanish side . . . same day I made a jaunt to Manshac to learn news. Upon my arrival there I found the ship had been taken by 13 men by surprise, & that they had dropped down below the Town to be more safe . . . . A small party [of] 40 men had been left at Manshac by Willing commanded by Elliot, which was attacked in the night by a party of 15 headed by Mr. Chrystie, the Am--s lost three or four people & the rest were dispersed and taken prisoners -- Chrystie's party being small & having many prisoners he thought it prudent to retire, by which the Coast became again clear for the Willingites . . . [sic throughout] (Rowland 1930:60-63).

After sacking Manchac, the marauders took their plunder downriver for auction in Spanish New Orleans. Through their violent actions, Willing and his men ended any chance of swaying West Florida colonists to the American cause. Not only had their property rights been violated, but the plantations of these colonists had been destroyed by a man who had been entertained only the year before in the very homes he pillaged (Caughey 1932:10-16, 31, 35; Johnson 1971:205, 209; Meyers 1976:32-36). William Dunbar recorded the general disgust toward the raiders:

> . . . the intention of the Americans was to rob & plunder Every English subject who had property of any value Some few excepted . . . the Party was commanded by James Willing of Philadelphia, a young man who had left this Country the year before; perfectly & intimately acquainted with all the Gentlemen upon the river at whose houses he had been often entertained in the most hospitable manner . . . . This was the Gentleman our friend & acquaintance, who had frequently lived for his own conveniency for a length of time at our houses . . . . Villains, Rascalls. Twould be a prostitution of the name of Americans to honor them with such an apellation [sic throughout] (Rowland 1930:60-63).

Following the Willing raid, the British reactivated Fort Bute and reinforced their other Mississippi River posts; however, all forces were surrendered to Spanish troops in September 1779. Spain had entered the Revolutionary War the previous June as a French ally, prompting Louisiana Governor Bernardo de Galvez to commence immediate action against the British. At the close of the war, West Florida was ceded to Spain through the 1783 Treaty of Paris (Figure 4). Fort Bute remained under Spanish control until the

Baton Rouge and Manchac districts were combined as the *Distrito de Baton Rouge* in late 1794 (Casey 1983:35-36; Johnson 1971:211-213, 218-219; Meyers 1976:67).

Spanish Colonial Period. When the Baton Rouge region fell under Spanish dominion in 1779, Joseph F. W. Des Barres was hired to survey the area, and instructed to identify the landowners (Figure 5). Many of the British claims were nullified, including those tracts granted to veterans for their services to the crown during the Seven Years' War (Goodwin et al. 1990a:25). English settlers who remained in the Baton Rouge area were required to take an oath of allegiance to Spain. Those who did not swear fealty were deported at Spanish expense, and their property was sold to reimburse the government (Meyers 1976:63-64).

It was under Spanish rule that Acadian families first settled in the Manchac District. The Acadian settlement at St. Gabriel already had been established below the Iberville River [Bayou Manchac] in 1767. Nearly two decades later, *Le Bon Papa* arrived in New Orleans in late July 1785; the vessel carried approximately 155 French passengers, including 27 Acadian families who were to settle above the bayou in the Manchac District. On August 28, the immigrants were transported upriver to their new homes in the Lafourche District, near the Bayougoula and Manchac posts (Brasseaux 1987:93, 97, 107-109, 111). With this population influx, Manchac grew from only 77 inhabitants in early 1785 to 284 by 1788 (Dalrymple 1978:31).

According to a Spanish map drawn in 1799, some of the Acadian families lived at one time within the project vicinity. While spring floods were expected as an annual occurrence, the bend in the river now known as Conrad's Point apparently was particularly prone to overflow. The spring of 1788 brought a terrible flood to the Baton Rouge area; the Mississippi River inundated the Manchac District lowlands, wreaking devastation on the farms of the new settlers. Governor Esteban Mirò established an emergency fund for the Acadians, "to succor them with corn and rice" (Meyers 1976:60). However, this temporary aid was not enough to induce the Acadian families to remain at the riverbend; by 1799, many of the lowland farms had been abandoned (Figure 6).

The United States purchased the Louisiana Territory, with the exception of West Florida, from France in 1803. Because West Florida had been acquired from England through conquest, Spain insisted that the region was not affected by the Louisiana Purchase. Despite conflicting claims, the Spanish government retained control of that portion of eastern Louisiana above the Isle of Orleans (known today as the Florida Parishes of Louisiana) until 1810 (Figure 4) (Burns 1932:397-409; Chambers 1898:24-33). It was under Spanish rule that the lowlands abandoned by the Acadians after the 1788 flood were parceled out again to new settlers. The Spanish colonists listed in the project vicinity, ca. 1810, were: D. [Don] Daniel Hicky [Hickey], Vinda Juana Daigle, and Francisco Alex. Daigle, whose claims dated from at least 1799, and D. Jorge Mather, Pablo Trahan, Luis Daigle, Juan Carlos Tuillier, Francisco Medero Tuillier, and Samuel Moor, all of whom occupied a portion of the former Acadian lands (Figures 6 and 7).

The patriarch of some of these early land claimants was François Marie Daigle, who brought his family to Louisiana aboard *Le Beaumont*, which carried the third shipload of Acadians from France to New Orleans in August 1785. Included among his children were François Alexandre Daigle, Louis François Daigle, and Flora Adelaide Daigle, the latter of whom later married Jean Charles Tullier [Tuillier] in 1790. Most of the *Le Beaumont* passengers were transferred upriver to the west bank of the Mississippi in present-day West Baton Rouge Parish. François Marie Daigle settled his wife and minor children across the river at the Manchac post; however, West Baton Rouge Parish records indicate that the Daigle sons and Tuillier each owned several land tracts on both sides of the Mississippi River throughout the early nineteenth century (Brasseaux 1987:109-111; Kellough and Mayeux 1979:52-53, 98).

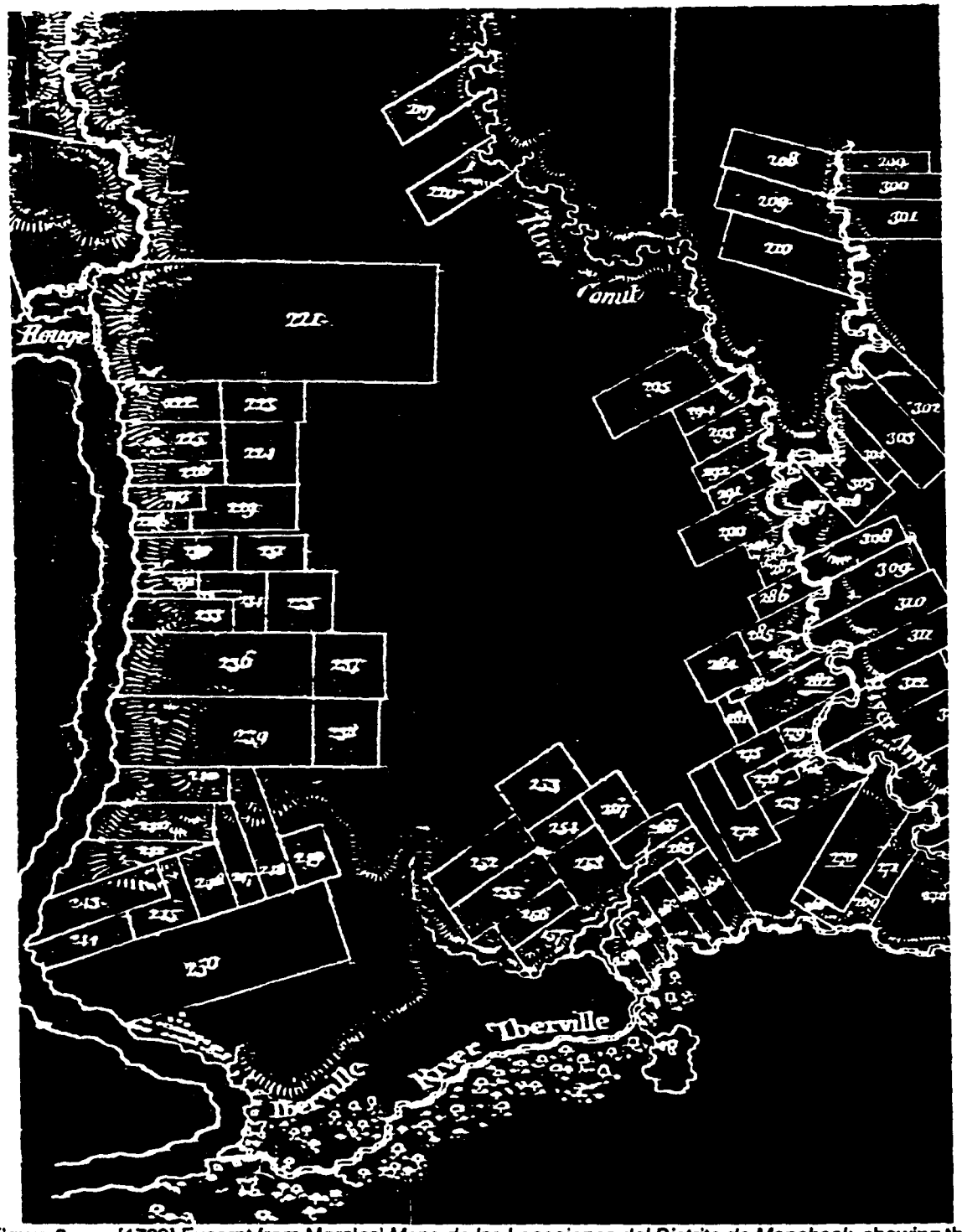


Figure 6. [1799] Excerpt from Morales' *Mapa de las Locaciones del Distrito de Manchack*, showing the project vicinity.

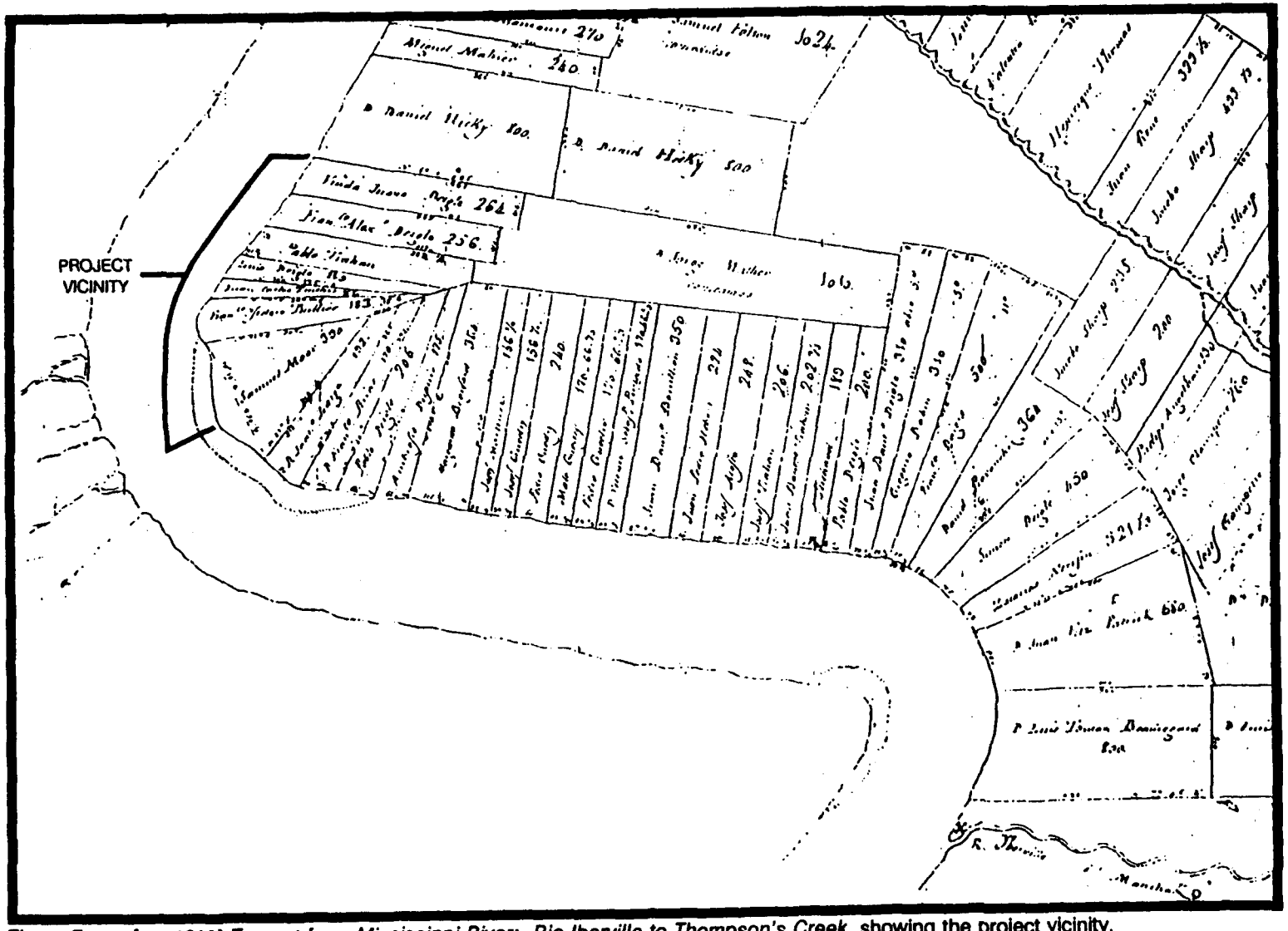


Figure 7. [ca. 1810] Excerpt from *Mississippi River: Rio Iberville to Thompson's Creek*, showing the project vicinity.

Independent State of West Florida

Spanish land grants made after 1803 in the "Florida Parishes" region were not acknowledged by the United States; however, the U.S. government honored settlers' individual claims, regardless of loyalties (Ellis 1981:69). As more American settlers moved into the area, the growing population became increasingly dissatisfied with Spanish colonial rule. Spain's refusal to permit the settlers a representative government finally brought matters to a head in the summer of 1810. With the permission of Baton Rouge District Governor Carlos de Lassus, American citizens met north of the town of Baton Rouge to formulate a plan of government that would allow representation of the settlers while still retaining the Spanish bureaucracy. The Spanish officials outwardly cooperated with the settlers, but secretly sent for military reinforcements from Pensacola and Cuba. When they discovered the Spanish duplicity, the Americans openly rebelled against the colonial government. They captured the fort at Baton Rouge on September 23, and declared independence from Spain on September 26, 1810 (Figure 4) (Chambers 1898:27-32; Davis 1971:172-173; Jennings 1974:27-38).

Interestingly, two of the most influential men involved in these proceedings were landholders in the project vicinity: Philip Hickey (son of Daniel Hickey) and George Mathers, Sr. These two men were trusted friends of Governor de Lassus, who sent them to collect information at the first American meeting on June 23, 1810. However, Hickey and Mathers agreed with the settlers, and not only relayed the initial plan of American/Spanish compromise to De Lassus, but also petitioned the governor for further meetings. The Americans elected Hickey as a delegate to the convention that was to decide the new representative government; Mather was appointed recorder. Once he learned that his "friend," Governor de Lassus, secretly had requested armed assistance against the Americans, Philip Hickey acted as "Paul Revere" for the rebellion, warning the American settlers. The following morning, Hickey entertained the governor at his home, proving that two could play the game of deceit (Jennings 1974:27-31; Meyers 1976:83-91).

Following their declaration of independence from Spain, the convention delegates met at St. Francisville to organize a new government and to petition the U.S. Congress for annexation of the Republic of West Florida to the Territory of Orleans. By proclamation dated October 27, 1810, President James Madison ordered Orleans Governor William C. C. Claiborne to take possession of West Florida. In December, Claiborne designated the West Florida region between the Mississippi and Perdido rivers to be Feliciana County; that part of the county west of the Pearl River was divided into the parishes of East Baton Rouge, Feliciana, Saint Helena, and Saint Tammany. Claiborne appointed George Mather district judge for Baton Rouge, a position that he held for only a few months before resigning. On April 14, 1812, President Madison signed the congressional act adding those four parishes to Louisiana (Davis 1971:173, 176; Meyers 1976:122, 124).

Antebellum Era

The project vicinity was affected only indirectly by the War of 1812. In June 1814, Admiral Alexander Cochrane suggested that the capture of the town of Baton Rouge would facilitate British control of the Mississippi River and would effectively cut off communications between New Orleans and the rest of the country; however, the plan never was implemented (Owsley 1981:101-102). However, in anticipation of such a threat, General Andrew Jackson ordered the Iberville River [Bayou Manchac] dammed at its confluence with the Mississippi, to prevent British use of that route (Davis 1971:179; Huguet 1976:10).

The Iberville was reopened for a short period after the end of the war, but frequent flooding caused area planters to petition the state legislature to close it again (Huguet 1976:10-11). After its abandonment, commerce moved overland. The waterway also was reduced in status by nomenclature; by the mid-nineteenth century, the Iberville River commonly became known as Bayou Manchac (Bayley 1853; Boyd 1849).

The U.S. government originally surveyed the region fronting the project area between 1820 and 1830. Only after resurveys from 1849 - 1858 did the Secretary of the Interior give his final approval in 1859. The approved township survey listed many of the same claimant names noted on the ca. 1810 Spanish survey, including Philip and Daniel Hickey, George Mather, and the Tuillier family. Although they had been granted under Spanish dominion, these claims were not confirmed by the U.S. government until 1813 (Figure 8) (Louisiana Surveyor General 1859).

Cottage Plantation. Cottage Plantation was established during the early nineteenth century from lands claimed by Charles Tuillier, J. C. Tuillier, J. F. Tuillier, and Daniel Hickey [Sections 50, 51, 52, and 54, T8S, R1W]; Sections 49, 75, and 53 still were listed as public lands on the township survey (Figure 8) (Louisiana Surveyor General 1859). Both the Tuillier and Hickey families made notable contributions to the settlement history of West Florida and the Baton Rouge area. Daniel Hickey was an Irishman described by a contemporary [traveler Dr. John Sibley] as "remarkable for his good living and Hospitality" (Bannon et al. 1984:38). According to Dalrymple (1978), Hickey was serving the British government as a Pensacola-based Indian Commissary when he purchased land above Baton Rouge on November 29, 1768. It is not known when Hickey moved to the area (his correspondence indicates that he still resided in Pensacola in 1769; however, by mid-1776, he was living in the Manchac District. His son, Colonel Philip Hickey, developed Hope Estate, immediately above the project area. As noted earlier in the text, Philip Hickey played a significant role during the West Florida Rebellion against the Spanish colonial government (Conrad 1988:401-402; Dalrymple 1978:47; Dart 1929:632-637).

The tracts owned by these various landholders were consolidated by Abner Lawson Duncan, a New Orleans attorney and former aide to Governor Claiborne (Owsley 1981:152). Duncan presented Cottage Plantation and its slaves as a wedding gift to his daughter, Frances Sophia, and her fiancé, Frederick Daniel Conrad, a young attorney in the Duncan law firm. The plantation was held in the Conrad's possession from ca. 1824 - 1825 to the mid-twentieth century.

The plantation house was built around 1824 - 1825 in the upper part of Section 53, T8S, R1W. The two-story Greek Revival mansion, with its large rooms opening to spacious galleries, is considered a predecessor to Oak Alley and other similar grand riverfront plantation homes (Figure 9) (Greene et al. 1984:3:Site 309; Kerr and Morgan 1951:9-10; Laughlin 1951:Plate 32; Spratling and Scott 1927:22). The misleading name of the plantation was derived from the smaller Duncan summer house that previously existed on the site; the family referred to the visits to their Baton Rouge property as "going to the cottage," an appellation that continued in use after the mansion was built (*Louisiana Traveler* 1955; Price 1939).

Frederick Conrad and his three brothers, all of whom resided at Cottage Plantation at some point in their lives, occupied a unique place in Louisiana history; all four brothers -- Frederick, Charles, Alfred, and Francis -- served in the state legislature at the same time. Charles Magill Conrad moved up in the political hierarchy to become a U.S. senator and Secretary of War under President Millard Fillmore (1850 - 1853) (Price 1939).

The Conrad family entertained such noted visitors as the Marquis de Lafayette at Cottage Plantation. According to Lafayette's secretary, A. Levasseur, the visit in April 1825 apparently was only a brief stop along the Lafayette excursion up the Mississippi River:

> Twenty-four hours after leaving New Orleans, we arrived at Duncan's Point, where we were met by a delegation of citizens who had come down from Baton Rouge -- which is situated eight miles above -- to ask General Lafayette to stop and spend a few moments among them. The general thankfully accepted the invitation and two hours afterward(s) we landed at

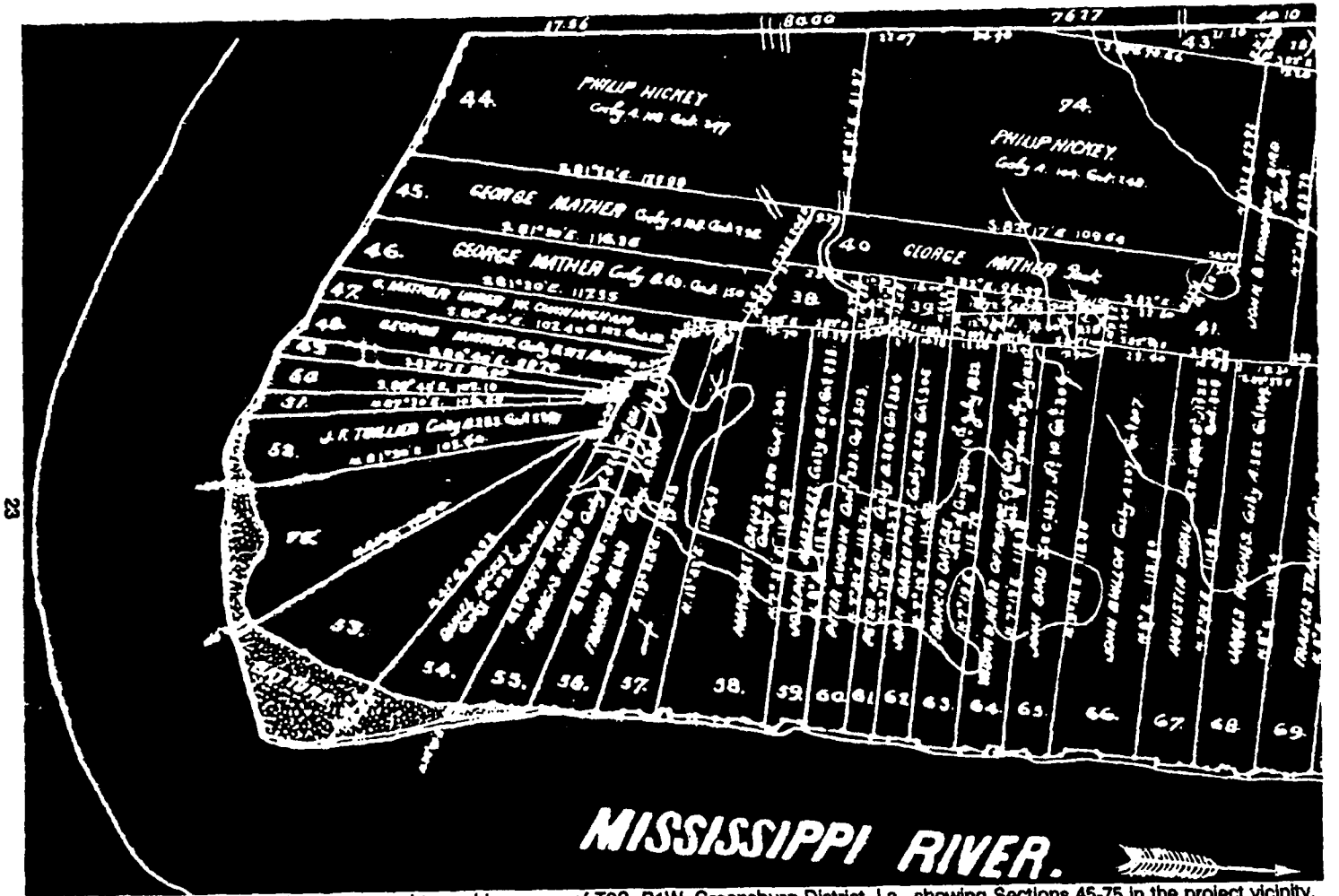


Figure 8. [1859] Excerpt from approved township survey of T8S, R1W, Greensburg District, La., showing Sections 45-75 in the project vicinity.

Figure 9. Copy of a photograph of The Cottage, Cottage Plantation mansion at Duncan, or Conrad's, Point (Kerr and Morgan 1951:9).

> the foot of the amphitheatre above which the city is built (Colomb 1931:178).

Other celebrated visitors through the years included Zachary Taylor, Jefferson Davis, Judah P. Benjamin, and Henry Clay (Greene et al. 1984:3:Site 309; Kerr and Morgan 1951:9; Laughlin 1951:Plate 32). In fact, Clay was considered such a close family friend that one Conrad daughter, Henrietta, was named in honor of the statesman (Price 1939).

Frederick Daniel Conrad established Cottage Plantation as a very successful sugar-producing operation before the Civil War. The 1860 census records listed F. D. Conrad as a Virginia-born farmer owning 1,400 improved acres and 1,545 unimproved acres, all valued at $150,000.00. The cash value of the farm property alone was $110,000.00, while Conrad's personal property was worth $262,800.00. In 1860, the 248 Conrad slaves, who occupied 50 slave dwellings, produced 215 hogsheads (1,000 pounds each) of cane sugar, 14,000 gallons of molasses, 7,500 bushels of Indian corn, 200 bushels of peas and beans, 150 bushels of Irish potatoes, and 300 bushels of sweet potatoes. Conrad's livestock included 48 horses, 50 asses and mules, 18 milk cows, 12 working oxen, 120 sheep, 50 swine, and 40 cattle (Menn 1964:139-140).

Just before the Civil War, the riverbend fronting Cottage Plantation was the scene of a tragic steamboat explosion. On Sunday morning, February 27, 1859, the U.S. mail packet *Princess*, (reportedly the fastest steamboat on the Mississippi at that time [Twain 1911:132]), exploded and burned at Conrad's Point while en route to New Orleans with a load of cotton and over 250 passengers and crew members. As the point closest to the burning wreck, Cottage Plantation became the rescue site. Aided by planters and slaves from neighboring plantations on both sides of the river, the overseer of the Cottage Plantation, W. M. Boswell, rallied his work force to pull survivors from the river. Mr. Boswell and Gilbert Sees, a carpenter at the Cottage Plantation, were cited in contemporary newspaper accounts for their outstanding rescue efforts (Affleck 1859; Baton Rouge *Weekly Advocate* 1859; *New Orleans Daily Picayune* 1859). Once on shore, the scalded victims were rolled in flour-covered sheets spread by the Conrad slaves, a treatment considered then "an almost instantaneous cure" for burns (Coulter 1960:22; Morgan 1917:3-5; Storer 1828-1829:734-735). James Morris Morgan, a frightened young boy attempting to find out the fate of his parents, thought to be on board the *Princess*, witnessed the dreadful scene:

> From the levee I rushed into the park in front of Mr. Conrad's residence and there saw a sight which can never be effaced from my memory. Mr. Conrad had had sheets laid on the ground amidst the trees and barrels of flour were broken open and the contents poured over the sheets. As fast as the burned and scalded people were pulled out of the river they were seized by the slaves and, while screaming and shrieking with pain and fright, they were forcibly thrown down on the sheets and rolled in the flour. The clothes had been burned off of many of them. Some, in their agony, could not lie still, and, with the white sheets wrapped round them, looking like ghosts, they danced a weird hornpipe while filling the air with their screams. Terrified by the awful and uncanny scene, I hid behind a huge tree so that I should not see it, but no tree could prevent me from hearing those awful cries and curses which echo in my ears even now (Morgan 1917:4).

Despite the immediate reaction to the catastrophe, it was estimated that approximately 70 lives were lost (Carleton 1981:60-61; Detro et al. 1979:521).

Laurel Place/Plantation. Immediately above Cottage Plantation and below Hope Estate was Matthew Ramsey's sugar plantation, Laurel Place (Figure 10). The Ramsey plantation was composed of tracts formerly belonging to George Mather, whose various claims were confirmed in 1813. Mather was born in England, but came to the Baton Rouge District around 1775; as noted earlier in this chapter, he was an influential figure in the West Florida Rebellion and in early East Baton Rouge Parish history (Meyers 1976:122). The Mather tracts that comprised the riverfront of Laurel Place were Sections 45, 46, 47, and 48, T8S, R1W (Figure 8) (Louisiana Surveyor General 1859).

A succession of owners followed George Mather. One survey noted Caldwell as inhabitant of that stretch of riverfront in 1839 (Porter 1839). In 1851 - 1852, the annual sugar report listed Charles Jones as owner of Laurel Plantation, which produced 50 hogsheads of sugar that season (Champomier 1852). However, by 1857, Matthew Ramsey was planting sugar cane at Laurel Plantation, the river landing then recorded at mile 124 above New Orleans (Henry and Gerodias 1857:29).

The Civil War

The first year of the Civil War was a profitable one for Louisiana sugar planters. Cottage Plantation sugar production leaped from 220 hogsheads for the 1860 - 1861 season, to 600 hogsheads in 1861 - 1862. The yield at Laurel Plantation nearly quadrupled, from only 47 hogsheads produced in 1860 - 1861, to 181 hogsheads in 1861 - 1862 (Champomier 1860-1862). However, with the surrender of Baton Rouge to Federal troops in May 1862, local fortunes took a turn for the worse.

After the fall of Baton Rouge that summer, hundreds of area residents fled the city; many headed south to the river plantations, while others traveled northeast toward their summer cottages in Greenwell Springs. The river plantations south of Baton Rouge proved no haven, for those that were not destroyed were occupied and ransacked by Federal troops (Bannon et al. 1984:69-73; Burgess 1917-1918:34-35). Like many of his neighbors who sought refuge in interior Louisiana, Frederick Conrad took his family to St. Helena Parish for the duration of the war (Price 1939).

Ironically, the impetus for the Conrads flight appears to have come from a "Yankee" relative. Prior to Federal occupation of Cottage Plantation, Commodore Levin Powell, identified as a nephew or cousin of Frederick Conrad, shelled the trees around the mansion in an attempt to "annoy" his Confederate kin. The two men had argued earlier because Powell refused to resign his commission with the U.S. Navy when the war began. The bombardments became quite a game for a time; each new barrage sent the occupants flying out of the house to seek shelter behind the levee.

However, the Union army did not occupy the plantation immediately. Conrad had seen three sons leave home to serve the Confederacy; one daughter-in-law, Mrs. Duncan Conrad, stayed at Cottage Plantation and gave birth to her first child while her husband was away. Confined to her room and unable to travel, she became so hysterical each time a Federal soldier entered her chamber that the troops reportedly retreated in confusion (Hansen 1971:514; Price 1939).

Following the eventual departure of Conrad and his daughter-in-law, Cottage Plantation was used by Union troops through the remainder of the war as a hospital for wounded and yellow fever-stricken soldiers. The dead were buried near the house in unmarked graves among a grove of cedar or cypress trees that still stood during the mid-twentieth century. Fear of contagion kept vandals at bay after the war, although the Federal occupiers already had looted the plantation's provisions, furniture, and other valuables (Hansen 1971:514; Kerr and Morgan 1951:9; Laughlin 1951:Plate 32; Price 1939).

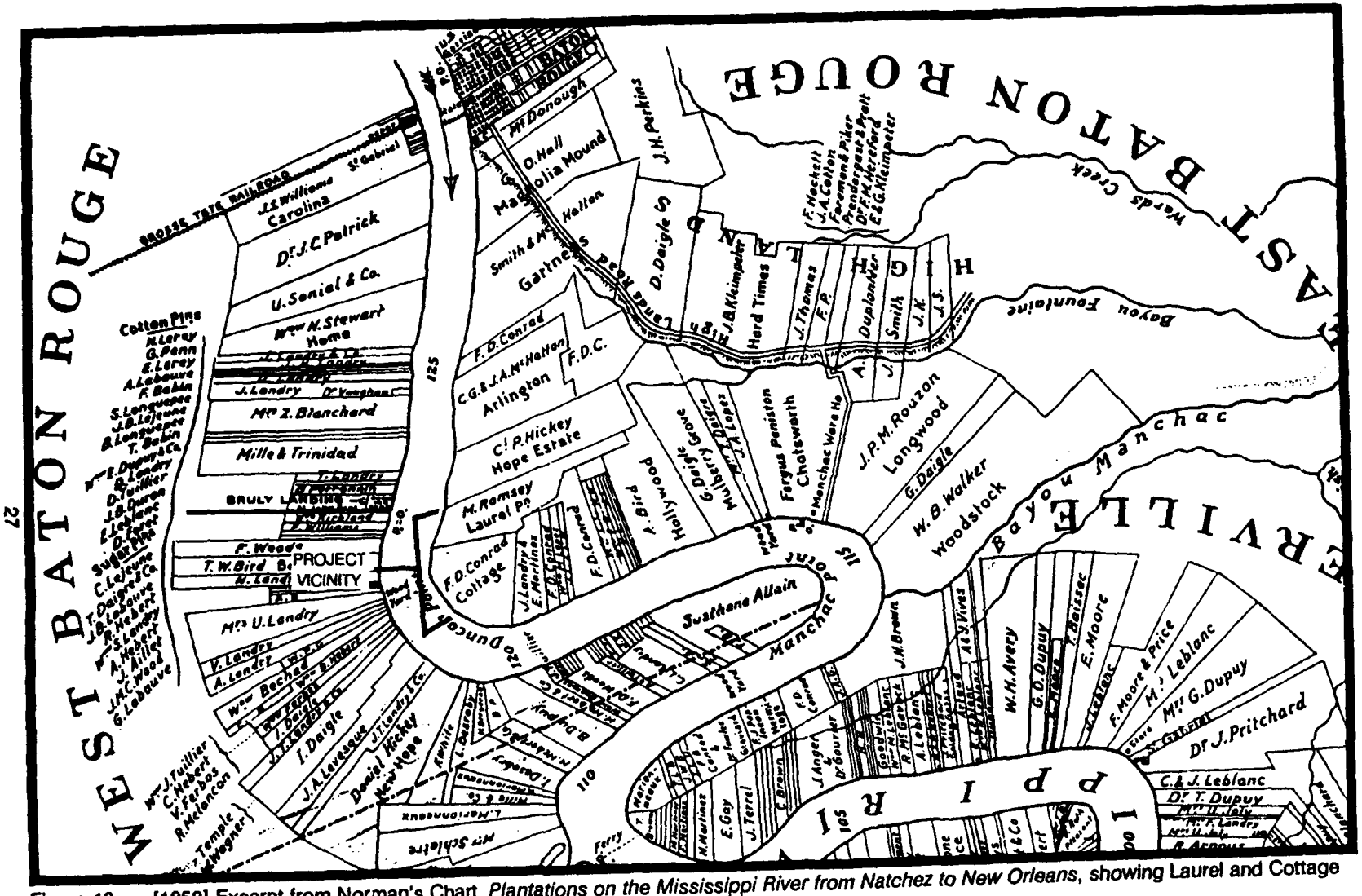


Figure 10. [1858] Excerpt from Norman's Chart, *Plantations on the Mississippi River from Natchez to New Orleans*, showing Laurel and Cottage Plantations at Duncan Point.

Postbellum Era

The close of the Civil War brought hard times and hauntings to Cottage Plantation. Following his return to Conrad's Point, Frederick Conrad reportedly died of sorrow over his devastated home and lands (Price 1939). His secretary, Angus Holt, continued to live at Cottage Plantation, but developed eccentric habits while there, allegedly saving scraps of food and roaming through the house at night. One source stated that Holt never recovered from the effects of his Union imprisonment and, as a result, developed an extraordinary phobia of poverty. After his death, spectral sightings of the Scotsman Angus Holt were reported; these reports continued well into the twentieth century. Whether or not the spirit of Angus Holt participated in the ghostly slave "musicales" supposedly heard on the galleries of Cottage Plantation remains a mystery (Keyes 1945:xi; Laughlin 1951:Plate 33).

Following the death of Frederick Conrad, Cottage Plantation was managed from the mid-1860s through the 1870 - 1871 season by Mrs. F. S. Conrad. Sugar production dropped from its peak of 600 hogsheads produced in the 1861 - 1862 season to only 63 hogsheads in 1868 - 1869. One year later, sugar production had increased to a yield of 155 hogsheads of sugar and 12,600 gallons of molasses, but during the following season (1871 - 1872), production fell again to 100 hogsheads under the new management of A. L. D. Conrad & Company. Sugar production continued at Cottage Plantation on a relatively small scale into the early 1880s; by that time, as on neighboring plantations such as Magnolia Mound and Hope Estate, cotton had replaced sugar cane as the primary cash crop (Figure 11). After 1881, the brick and slate sugar house (with steam and kettle apparatus) that had existed at the plantation since the early 1850s no longer was listed on plantation inventories. Any small amount of cane still harvested could be processed at one of the neighboring plantations; the addition of a cotton gin was far more valuable to Cottage Plantation production than maintaining its sugar house (Bannon et al. 1984:75-76; Bouchereau 1869-1901; Laughlin 1951:Plate 32; Mississippi River Commission [MRC] 1879-1880:Charts 66 and 67).

On the other hand, Laurel Place continued cane cultivation into the early 1880s. The plantation sugar house was destroyed ca. 1870, but by 1872 it had been rebuilt as a brick and shingle structure with a steam and kettle apparatus. Like Cottage Plantation, sugar production dropped at Laurel after a peak of 181 hogsheads during the season of 1861 - 1862, to a yield of only 48 hogsheads in 1870 - 1871. By that time, R. M. and D. H. Walsh were managing Laurel Place (listed as Laurels or Laurel in the 1870 - 1881 sugar and rice reports) which then was acquired by a succession of owners during the next decade: T. J. Buffington & Co., J. Barnard, Garig & Fisher, and William Garig. Laurel Place reached its top production under the ownership of Garig & Fisher, who produced a sugar crop of 217 hogsheads in 1880 - 1881. By 1890, under William Garig, rice had replaced sugar as the plantation cash crop. During the 1889 - 1890 season, 6,000 barrels were harvested, each weighing 162 pounds (Figure 11) (Bouchereau 1869-1890; MRC 1879-1880:Charts 66 and 67).

The Twentieth Century

Laurel Place remained in the hands of William Garig through the turn of the century (Bouchereau 1900-1901). By 1921, the plantation appeared on the Mississippi River Commission survey as the downriver portion of the Garett Estate, which apparently included lower Hope Estate; land divisions were designated under the names of Connely and Peter Paulfruy. Rice remained the cash crop at Laurel Place during the early twentieth century; Garett also apparently converted lower Hope Estate to rice cultivation (MRC 1921:Chart 66).

The Conrad heirs experienced a period of declining economic fortune at the turn of the century, when the cotton crop at Cottage Plantation was destroyed by the boll weevil (Price 1939). The Mississippi River Commission survey suggested that sugar cane was planted in the upper portion of the plantation, but the former cotton fields appear to have been abandoned by 1921 (MRC 1921:Chart 67). The Conrad family

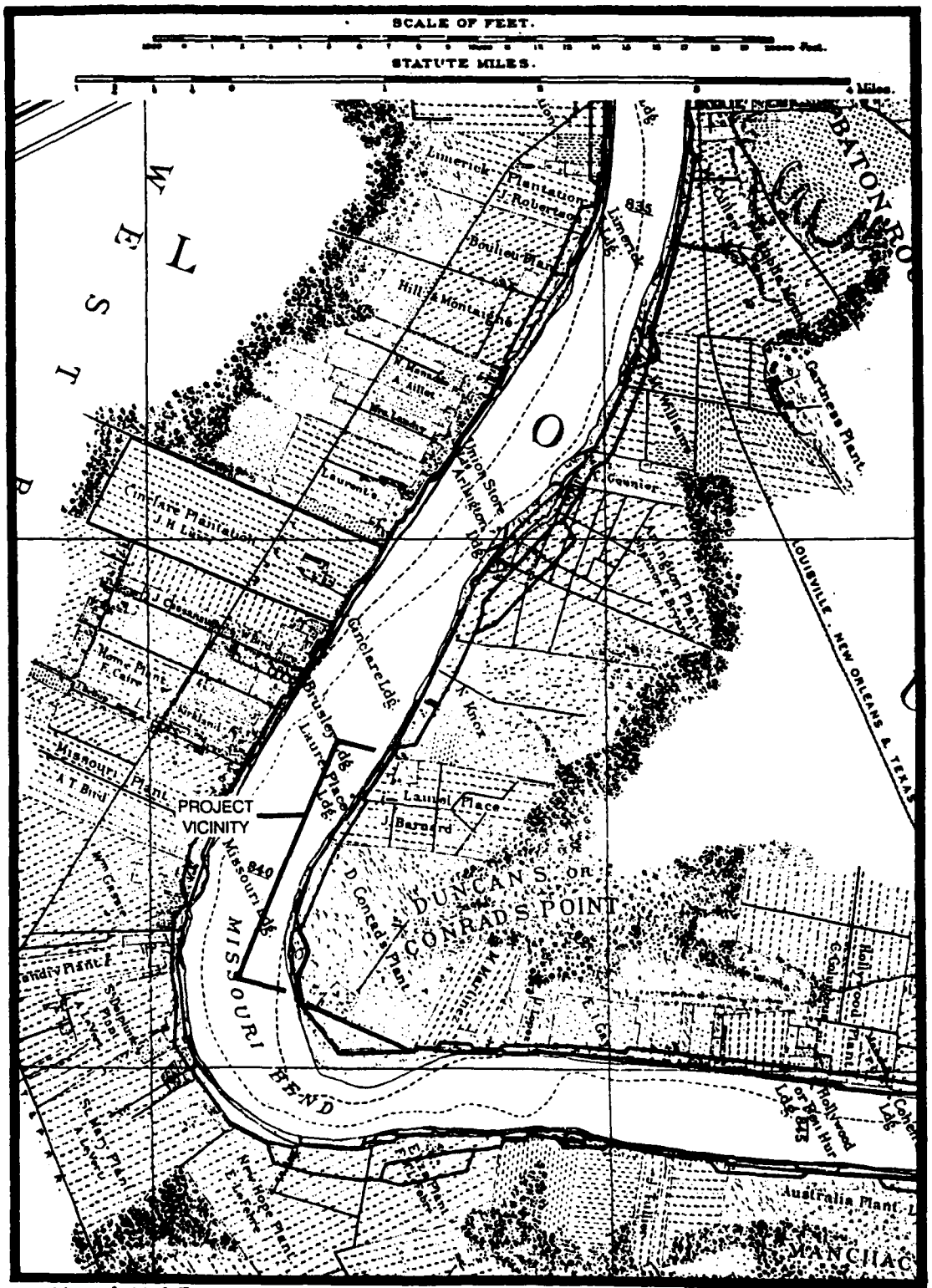


Figure 11. [1907] Excerpt from *Map of the Mississippi River from the Mouth of the Ohio River to the Head of the Passes*, Sheet No. 25, showing Laurel Place and Cottage Plantations.

finally leased the Cottage Plantation lands to tenants and vacated the mansion, which unfortunately fell into disrepair through the subsequent years. It was no doubt during these years of neglect that the previously cited plantation ghost stories became a part of local lore (Jones et al. 1990:128; Laughlin 1951:Plates 32 and 33; Spratling and Scott 1927:22).

During the twentieth century, Cottage Plantation gained national notoriety as a book and film setting. In 1917, the silent movie "Burning the Candle" was filmed there; 30 years later, Cottage Plantation was used in "Cinerama Holiday" (1956) and as Pointe du Loupe, the plantation home of Clark Gable, in "Band of Angels" (1957). Noted American author Frances Parkinson Keyes lived at the house from December 1943 through September 1945 while writing her novel *The River Road* (Keyes 1945:xi-xvi; *Louisiana Traveler* 1955; Baton Rouge *Morning Advocate* 1960). In addition to using the Conrad family home as a setting and research base, Miss Keyes employed some of the Conrad heirs. Frederick D. Conrad helped the author visualize the old plantation by "tramping over every inch of the property on Conrad Point" so that she "could mentally recreate all the buildings which once stood here;" his daughter and one of her cousins recounted stories of earlier days at Cottage Plantation, while another descendant, great-grandson James J. Bailey, posed for the jacket cover (Keyes 1945:xi-xii, xv). The long-vacant mansion apparently provided hardships as well as inspiration for Miss Keyes, who wrote in her introduction:

> While plying a profession peculiarly dependent upon communication, I have had to get along without a telephone, without mail service, without delivery of any commodity, even a newspaper. All this has taken some adjustment to meet, especially as the intermittent absence of water, roads which at times have been almost impassable, the ruin of two victory gardens -- one through drought and one through seepage . . . have further complicated the picture. I have found everything from snakes to skunks on my doorstep, and I have been obliged to combat mosquitos and other insects which found no difficulty in boring their way through two sets of screens and a mosquito bar . . . . even in my moments of greatest depression, I knew down deep in my heart that the beauty of my surroundings, the wealth of my material, . . . were far more significant than any obstacle in my path (Keyes 1945:xv-xvi).

Although they resided elsewhere, members of the Conrad family began restoration of Cottage Plantation mansion during the 1940s. When it was not occupied by film crews or literaries, the home was opened for public tours. In the mid-1950s, Conrad heirs James J. Bailey and his sister, Mrs. Claude F. Reynaud, transferred the plantation title to The Cottage, Inc., a family corporation formed to "preserve and exhibit the mansion as an [sic] historic Southern landmark" (*Louisiana Traveler* 1955). Sadly, fire destroyed the historic home on February 18, 1960. Authorities ruled the blaze accidental, suggesting that the cause may have been a lightning strike (Hansen 1971:514; *Morning Advocate* 1960).

Summary

Conrad's, or Duncan, Point has had a long and colorful history. The antebellum planters endured the hardships of the Civil War and changed their traditional sugar cane cultivation to cotton or rice for the sake of survival. While much of the project vicinity still is used for farm and pasture lands, the plantation buildings have fallen into disrepair through long years of neglect.

The grand mansion of the area, The Cottage, has become an overgrown ruin since fire destroyed it in 1960. No attempt ever has been made to restore the home. Several sources have suggested that, in

addition to the remains of the main house, other sites remain at Cottage Plantation, including an early nineteenth century slave cemetery, a Union burial ground, and the plantation well (Greene et al. 1984:Site 309; Heck 1970:51-52, 77; Jones et al. 1990:123-125, 130-131, 133-135; *Morning Advocate* 1960).

Laurel Place also has been affected by time and neglect. A few dilapidated structures remain: one small Acadian-style house, possibly built during the early twentieth century as a home for the plantation owner or manager; two shotgun shacks; and, two barns. All buildings are now unoccupied or used for storage. Two large live oak trees are situated in a manner that suggests that they may have fronted a structure that no longer exists; however, no evidence was found to corroborate that hypothesis (Jones et al. 1990:113, 115-121).

CHAPTER IV

POTENTIAL FOR SUBMERGED ARCHEOLOGICAL RESOURCES AT RED EYE CROSSING

Throughout the prehistoric and historic periods, the Mississippi River has been a major artery of transportation. Watercraft of all descriptions, from dugout canoes to the great "floating palaces" of the nineteenth century, have plied its waters. The river is also an extremely treacherous body of water with many natural hazards. Chief among these are shifting sand bars and snags formed from large trees that have washed into the river. Vessels also have been lost as a result of fires, explosion, warfare, and collisions with other vessels.

Many thousands of vessels have plied the waters of the Mississippi River from its headwaters to the Gulf of Mexico; literally hundreds, if not thousands, of them have been lost in the river as a result of natural disaster or human error. Many merely were abandoned when their useful lives had expired, while others served as floating wharves until they deteriorated and sank. These maritime activities have left a substantial archeological legacy along the Mississippi River and its tributaries, one that offers unique insights into both the material culture and evolution of transportation along the river.

The earliest watercraft used in the area most likely were simple log rafts or even individual logs. At some point in time, the aboriginal inhabitants of the region began to construct dugout canoes. Some of these canoes were large enough to hold between 75 and 80 passengers, seated three across. The remnants of De Soto's ill-fated expedition destroyed a number of these and smaller canoes in the "vicinity of Head of Passes in present-day Plaquemines Parish, Louisiana" (Pearson et al 1989: 70-71). Three such canoes have been found in Louisiana waters: the Fluker's Bluff Dugout Canoe, on display at the Museum of Geoscience at Louisiana State University, the Lake Salvador Dugout Canoe, now at Acadian Village in Lafayette (Terrel n.d.), and the Red River Dugout Canoe on display at the Louisiana State Exhibit Museum in Shreveport. Radiocarbon dates have been assigned to all three canoes. The Fluker's Bluff Canoe was dated from ca. 1240 A.D. Three dates have been derived for the Lake Salvador canoe: 410 ± 90 B.P. (1540 A.D.), 330 ± 80 B.P. (1620 A.D.), and 300 ± 80 B.P. (1650 A.D.). The Red River canoe has been dated by radiocarbon between 1005 and 1065 A.D. (Phillip Rivet, personal communication 1993).

It is possible that any number of these vessels may have come to grief in the vicinity of Red Eye Crossing without leaving any historical record of the event. The physical remains of such vessels could be discrete, with low profiles and scant ferrous metal fasteners that could make them undetectable with either magnetometer or side-scan sonar.

The Mississippi River in the vicinity of the project area has served as the major avenue for European exploration and commerce since Pierre Le Moyne, Sieur d'Iberville, first ventured upstream to the mouth of the Red River in 1699. French traders passed through the project area on their way between the settlements of Biloxi and Mobile and the Illinois country even before the establishment of New Orleans in 1718. Bayou Manchac, which enters the Mississippi River approximately five miles below the project area, served as a major communication link between Mobile and the Mississippi River, particularly after it was freed of obstructions in the 1760s. By providing a water connection to the Gulf of Mexico via the Amite River, Lake Maurepas and Lake Pontchartrain, the long and difficult passage across the bars blocking the mouths of the Mississippi. This route, however, required portages, which limited the size of the craft that could negotiate this route.

The French quickly adapted the Native American dugout canoe, or *pirogue* to their own use. Carved from a single cypress log, *pirogues* could reach up to 15 m (50 ft) in length and carry 50 tons of cargo.

The *bateau* eventually supplanted the pirogue as the most common carrier of freight employed on the river throughout the eighteenth century. The term *bateau* was freely applied to numerous vessel types and forms describing small to moderate sized sailing cargo vessels. The variant generally associated with inland waterways was flat-bottomed,double ended and carvel-built. They generally were propelled by oars or poles but could be fitted with sails (Chapelle 1951:34-35).

With the influx of Anglo-American settlers into Louisiana from the Ohio Valley in the late eighteenth century, flatboats and keel boats became a common site on the Mississippi River. Flatboats, also known as arks, family boats, flats, Kentucky boats, New Orleans or Orleans boats, and broadhorns, were constructed as a rectangular box with a low cabin. They were propelled essentially by the current of the river and guided by long sweeps. Flatboats were a cheaply constructed, one-way means of transportation that were usually broken up and sold for timber once they reached their destination.

Unlike the flatboat, the keelboat was designed for two-way travel. The keelboat and the barge, a somewhat larger variant, were built on a keel with frames covered with planks. They were narrow, double-ended vessels with a cabin amidships. Propulsion was provided by poles in shallow water, by oarsmen stationed in the bow, or, if conditions permitted, a square sail. The vessel was guided by a long steering oar at the stern.

The arrival of the steamboat in New Orleans on January 10, 1812, revolutionized river transportation. Although flatboats and keelboats continued in use for many years to come, it was the steamboat that was largely responsible for the rapid expansion of Americans into the West during the first decades of the nineteenth century. Freed of the constraints of current and wind, steamboats permitted the establishment of regularly scheduled packet service from New Orleans to the gateways to the West at St. Louis, Cincinnati and Pittsburgh.

Captain Henry M. Shreve is credited generally with developing the distinctive form of the western river steamboat. Typically, these vessels were shallow draft and almost flat bottomed. Because of their shallow depth of hold, engines and cargo were carried on the main deck. Passengers were quartered on the boiler deck above the main deck. Larger steamers might also boast a Texas deck, and a hurricane deck. The tier of decks was topped by the pilot house.

Steamboats on the Mississippi River normally were driven by two high pressure horizontal steam engines. Steam pressure in excess of 100 pounds per square inch was required to drive the vessels against the flood of the Mississippi whereas 15 psi was the more common operating pressure of engines propelling vessels along rivers and bays in the east. The high steam pressure required to drive the engines challenged the technology of the day to contain it. As a result, boiler explosions were an all too frequent occurrence.

River steamers typically were propelled by paddle wheels in order to maintain their shallow draft. Paddle wheels were either mounted on the stern of the vessel or slung from outriggers called guards on the sides. The more maneuverable sidewheelers were preferred on the Mississippi where the width of the river was not a limiting factor. Sidewheel steamers would have churned through the project area well into the twentieth century.

The rapid extension of railroad lines after the Civil War spelled the beginning of the end of the Steamboat Era. The low freight charges offered by the railroads diverted much of the bulk hauling business away from steamboats in the waning years of the nineteenth century.

The internal combustion engine fomented another revolution in the history of navigation. By the 1920s, a dramatic increase in bulk material handling was experienced by gasoline-powered towboats (Owens 1990:155). The towboats delivered their cargoes of coal, oil, gasoline, sand, gravel, cement, or brick on wooden barges.

According to nineteenth century directories, river landings existed at both Cottage Plantation and Laurel Place until at least 1881, although the Cottage Plantation landing did not appear on the 1879 - 1880 Mississippi River Commission survey (Figure 11) (Cayton 1881:20, 26; Henry and Gerodias 1857:29; MRC 1879-1880:Chart 67). By 1921, the Mississippi River survey showed neither landing (MRC 1921:Charts 66 and 67). Whether the landings were dismantled or simply deteriorated through disuse is unknown.

The proximity of Laurel Place and Cottage Plantation to the project area correlates with a high probability for submerged cultural resources. These resources could take the form of small vessels used at the plantations, abandoned vessels, structures associated with boat landings, and materials lost or discarded in the river at or near these landings. Considering the variety of activities which took place at river landings, there could be significant deposits of artifacts associated with these activities.

Historical research presented in the previous chapter revealed how the potential for underwater resources can be linked to landings located in the vicinity of the project area. Research has revealed that the sidewheel steam packet *Princess* may lie within the project area.

The *Princess*

The *Princess* was one of the fastest and most luxurious steamers on the Mississippi River prior to the Civil War, and held the record for the fastest time between New Orleans and Natchez. This time, 17 hours and 30 minutes, stood as the record, until it was surpassed in 1870 by the steamer *Robert E. Lee*, with a time of 17 hours and 11 minutes. The *Princess* was assured a place in history after her depiction by the renowned illustrators Currier and Ives (Figure 12). Her image was "used to illustrate everything in connection with western steamboat operations" (*The Waterways Journal*, November 6, 1954).

Built at Cincinnati, Ohio in 1855, the 715-ton *Princess* was 285 feet long, had a beam of 38 feet and a draft of nine feet (Detro et al. 1979:251). She was owned by Carroll, Holmes & Co. of New Orleans and made weekly runs from New Orleans to Vicksburg and back, stopping at various intermediate points to pick up passengers, cargo, and mail (New Orleans *Daily Picayune* [*NODP*] February 26, 1859:8).

On the morning of Sunday, February 27, 1859, the *Princess* was on her way to New Orleans with a number of prominent persons on board, many on their way to Mardi Gras. After making a stop at Baton Rouge at around 10:00 AM, she continued downstream. At approximately 11:00 AM, about a mile above Conrad's Point at Missouri Bend, the steamboat suddenly exploded without warning. According to one contemporary account: "Four of the large powerful boilers exploded at once, driving aft clearing all before them, and the whole upper cabin, state rooms, hurricane deck, texas and all, fell in almost immediately, and in a few minutes, the flames burst forth" (*NODP*, March 1, 1859:1). The burning vessel then "made a graceful turn to the left - to the shore - as if under the control of the pilot, and landed as beautifully as if under human guidance" (*NODP* Afternoon Edition, March 1, 1859:1). As the burning vessel neared shore, "a daring slave of [Cottage] plantation jumped into the river and swam nearly to the boat, and a line being thrown to him, he brought it ashore (Taken from the Baton Rouge *Weekly Advocate*, March 1, 1859. Printed in the *NODP*, March 2, 1859:1).

When the *Princess* grounded, many of the survivors, as well as people from surrounding plantations, began to rescue and carry off the injured and dead. There were many acts of bravery associated with these rescues, as well as some grisly descriptions of the carnage. A number of these rescues were carried out by slaves from the adjoining plantations and by the servants of those on board the ill-fated steamboat. One account describes how "a negro boy belonging to M. Robinson . . . saved a number of ladies after he himself got out [by] drawing them out with a forked stick." Another account relates how an elderly woman

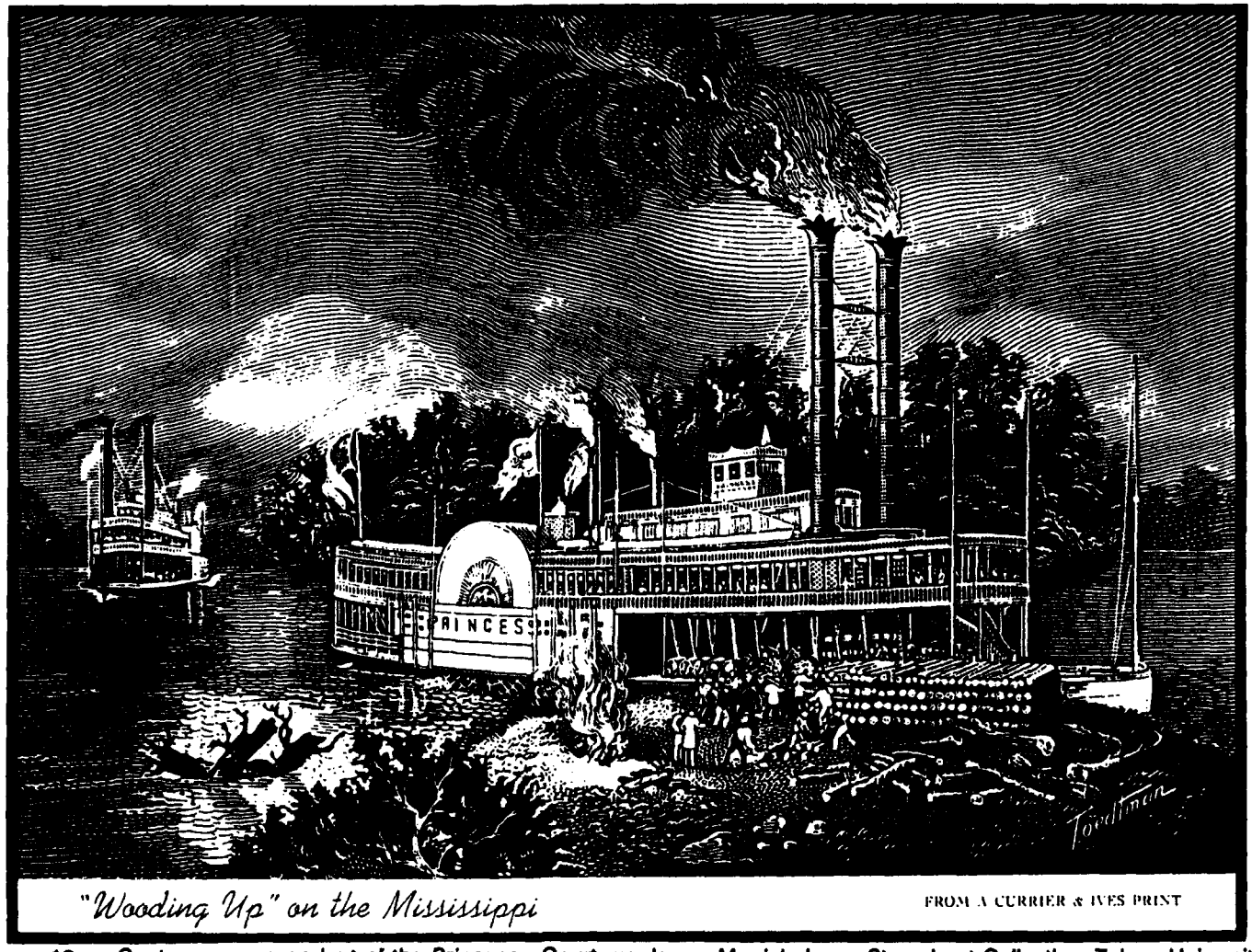


Figure 12. Contemporary woodcut of the *Princess*. Courtesy, James Merrick Jones Steamboat Collection, Tulane University, New Orleans.

home of Mr. Gilbert L. Sees that was "nearest the point where the *Princess* touched land" (*NODP* Afternoon Edition, March 2, 1859:1). In a letter written by one of the survivors to the Baton Rouge *Weekly Advocate*, Mr. Sees was praised for his assistance to the suffering (*Weekly Advocate* March 6, 1859).

One of the more horrifying tales from the disaster described the demise of the captain of the *Princess*. One eyewitness recounted that:

> Capt. Jackson was sitting in a chair on the hurricane deck, leaning against the skylights, when the explosion took place, and was blown up, and coming down with the timbers of the shattered wreck, was caught among them by the neck and shoulders, where he remained, struggling, till the flames gathering around and about him, burnt the timbers that sustained him and he fell - to be seen no more - into the raging fire below [Reprinted from the Natchez *Free Trader* in the *NODP* Afternoon Edition, March 4, 1859:1].

It is ironic that, in the same edition of the *Daily Picayune* that first reported the disaster, there was an advertisement for a device called "Miller's Steam Boiler Alarm and Water Gauge." This devise was intended to guard against boiler explosions by sounding a shrill whistle notifying the engineer that the water in the boilers was getting too low (*NODP*, February 28, 1859:4). It is even more ironic that, shortly before the explosion, Captain Jackson was describing this or a similar device to one of the passengers, Thomas Affleck, who wrote many of the news dispatches to the *Daily Picayune* concerning the disaster and who, luckily, got off in Baton Rouge (*NODP*, Afternoon Edition, March 1, 1859). Whether Captain Jackson was describing this device as being on his vessel or as something that he intended to have installed is not clear. However, if the steamboat was fitted with such a device, it clearly did not function properly.

On the day following the accident, the only sign of the site of the *Princess* disaster was "a few cotton bales floating about, here and there" (*NODP*, March 1, 1859:1). Apparently those portions of the vessel that protruded above the water had been consumed by fire, and the wreckage probably had begun either to settle into the shifting sands of the river bottom, or to slide off the bar into deeper water.

Some attempt was made to salvage materials, possibly machinery, from the wreckage. It was reported that about a week after the accident "The State steamer, with diving bell [had] been on the spot" (*NODP*, March 8, 1859:1).

The effects of this explosion were devastating to Louisiana society. Many prominent families living between Natchez and New Orleans lost at least one member in the accident. Among the casualties were two members of the state legislature, Messrs. Huard and Bannister; W. R. C. Vernon, the sheriff of Concordia Parish; Mr. Seymour H. Lurty, the sheriff of Bayou Sara; and Judge Henry Boyce and his nephew, both of Alexandria (*NODP* March 2, 7, and 12, 1859).

An explosion such as the one that destroyed the *Princess* probably deposited cultural materials at the site of the explosion, as well as in a debris trail formed as the vessel burned and drifted downstream with material falling from the collapsing upper works. Since the sinking, natural processes probably have scattered material over an even wider area. Depending on the thoroughness of the contemporary salvors, the site could yield a wide variety of artifacts ranging from the vessel's engines to small items belonging to the passengers and crew to remains of the cargo. At the time of the disaster, the *Princess* was said to be carrying "1756 bales of cotton, 200 ploughs, and sundry small articles of freight" (*NODP* Afternoon Edition, March 1, 1859:1).

Previous Archeological Investigations

Previous archeological research in the project area has been, for the most part, restricted to terrestrial surveys. The potential for submerged cultural resources within the project area has been addressed peripherally in general discussions concerning waters under the jurisdiction of the New Orleans District of the U.S. Army Corps of Engineers (Pearson et al. 1989). This study focuses on previous investigations conducted within an area extending from Mile 218.5 to 226.5.

Shenkel (1976) conducted a survey of the batture at Conrad's Point prior to major levee improvements. No sites were located and no further work was recommended. The National Park Service (Stuart and Greene 1983) surveyed a portion of the batture at Missouri Bend on the west side of the Mississippi River. No sites were located and no further work was recommended.

Coastal Environments, Inc. (Glander and Gagliano 1977) surveyed a portion of the batture to the east of Conrad's Point between Section 60 and Section 68 of T8S, R1W, and from the low water line to landside toe of the current Mississippi River system. This survey located the remains of historic Hollywood Plantation, 16EBR46, and determined that the site was potentially eligible for inclusion on the National Register of Historic Places. It was recommended that a proposed borrow pit be relocated in order not to impact the site. R. Christopher Goodwin & Associates, Inc. (Goodwin et al. 1983) assessed 16EBR46 prior to revetment construction and concluded that the site did not possess the integrity for National Register inclusion. The investigations concluded that all surface remains within the project area were confined to the actively eroding bankline. No intact archeological features or architectural remains were encountered. Therefore, no further work was recommended.

R. Christopher Goodwin & Associates, Inc. (Goodwin et al. 1990b) examined a portion of the batture on the west bank of Missouri Bend prior to revetment construction. Archival research had suggested that the remains of two landings and a wood yard might be present in the area. One site, the remains of historic Clara Belle Plantation, 16IV160, was located during this survey. It was determined that the site lacked integrity and does not meet the criteria necessary for inclusion on the National Register. No further work was recommended at this site.

Louisiana State University's Museum of Geoscience (Jones et al. 1990) surveyed an area of batture and adjoining high ground extending from approximately M-222.2 to 226.1-L prior to the construction of a new berm and the expansion of an existing revetment. The most substantial and important site by that survey located in the project vicinity was the ruins of Cottage Plantation, 16EBR57. This survey determined that the proposed work would not affect the archeological integrity of the Cottage Plantation site since it technically lay outside the project area.

CHAPTER V

PROCEDURES FOR SURVEY AND ANALYSIS

Description of the Project Area

The project area is located in the Mississippi River, from M-223.3 to 224.7 (AHP) in East Baton Rouge Parish, Louisiana. The project area extends from the Low Water Reference Plane on the left descending bank, near Conrad's Point to the closest edge of the navigation channel at Red Eye Crossing at the time of the survey, the level of the Mississippi River was exceptionally low. A level of 2.46 m (8.1 ft) was recorded at the Baton Rouge gauge on November 11, 1992. Two months later, a level of 7.16 m (23.5 ft) was recorded at the same gauge.

Equipment and Methods

The investigative methodology was designed to accommodate a gentle bend in the river by establishing two slightly overlapping survey blocks (Figure 13). Block A, at the lower end of the project area, measured 549 x 793 m (1,800 x 2,600 ft); Block B measured 529 x 1,781 m (1,735 x 5,844 ft). A total of 12,419,375 square ft, or 285.1 ac, of submerged land was surveyed. The survey blocks were divided into transects spaced 246 m (75 ft) apart and oriented parallel to the river bank. Some transects near the shore in Block B were eliminated because of low water; other transects extended into the navigation channel to ensure survey coverage of the entire block.

The remote sensing array consisted of a Geometrics G866 proton precession magnetometer, an EG&G 260 sidescan sonar, and a recording echosounder. Magnetic readings were collected at one-second intervals on the G866's internal thermal recorder and on magnetic media by means of a link-up with a laptop PC programmed with Geometrics' *MAGPAK* software. The magnetometer sensor was floated on the surface at a distance of 164 m (50 ft) behind the aluminum survey boat. Clean magnetic readings with less than 2 gamma fluctuation were achieved in areas away from artificially induced magnetic disturbances.

The EG&G 260 sonar was operated at its 100 kHz setting and a minimum range setting of 25 m (82 ft). The sensor was slung from the forward starboard quarter of the survey boat and towed at a depth of about 1.3 m (4 ft) below the surface. The chart speed was manually set at 2 kts, which closely duplicated the average boat speed maintained during the survey. Acoustic data were recorded on the 260's internal thermal recorder. Each chart was annotated according to transect.

Positioning control was maintained by a Differential Global Positioning System (DGPS) consisting of a Magnavox 200 GPS receiver and a Micronet Data Link that provided corrections to compensate for the Department of Defense's induced Selective Availability (SA). Corrected positions were read into a Macintosh Classic II computer running *Navigatel* software to provide navigational control and to record position fixes. GPS outputs coordinates in ellipsoidal (Latitude/Longitude) coordinates, with reference to the NAD87 datum. Coordinates of located anomalies were provided to the Corps of Engineers in Louisiana State Plane coordinates referencing the NAD27 datum. Coordinate conversion was accomplished through the use of *Corpscon* software available from the National Oceanographic and Atmospheric Administration's Hydrographic Survey Branch.

A number of environmental factors affected the survey, the most severe of which was weather. A cold front hovered over the Baton Rouge area for much of the week (November 4 through 11, 1992) during the project, bringing with it heavy winds and rains. One planned survey day had to be canceled due to weather conditions. Exceptionally low water levels also had caused the Mississippi River to drop below the

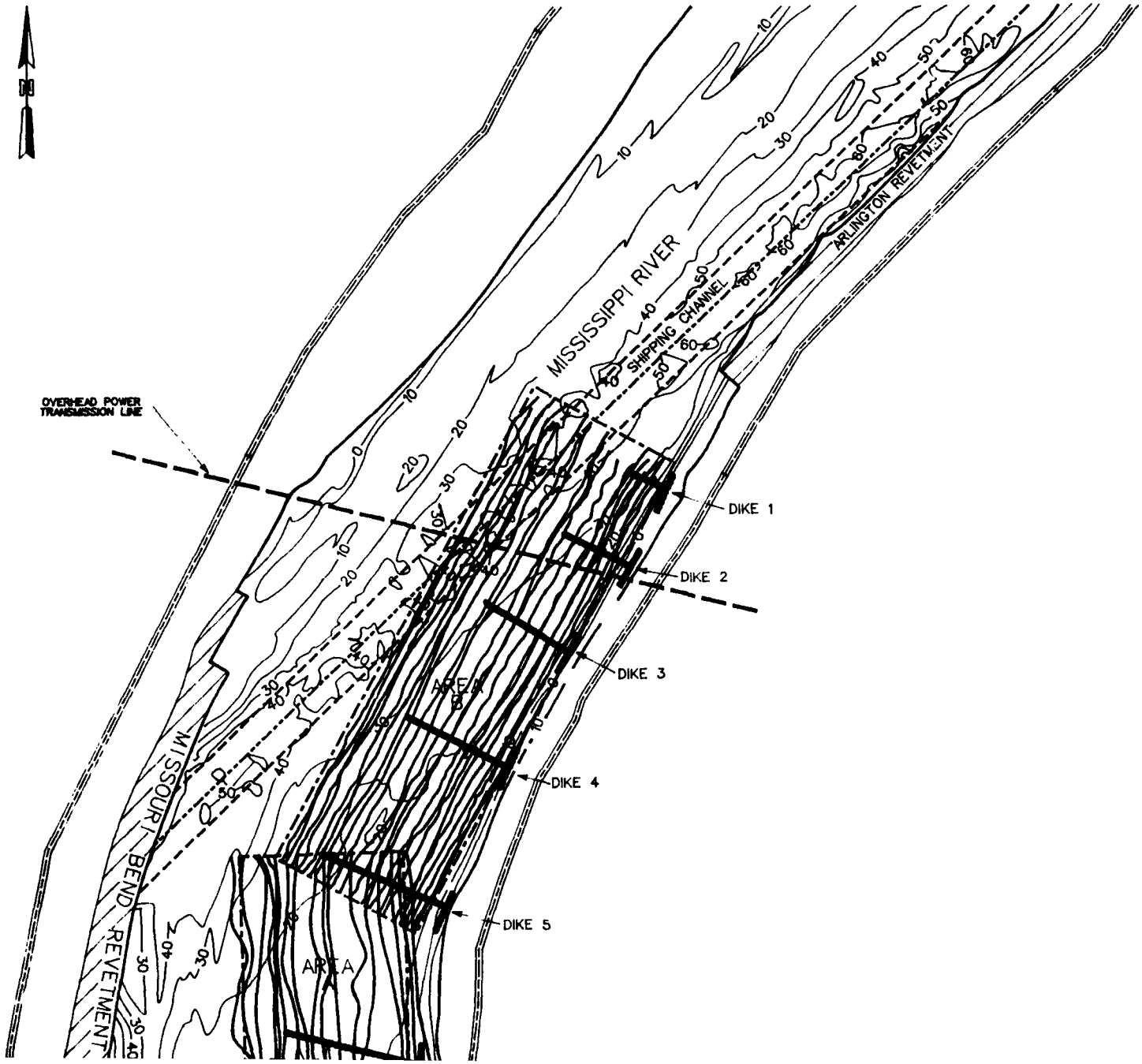

OVERHEAD POWER TRANSMISSION LINE
MISSISSIPPI RIVER
SHIPPING CHANNEL
ARLINGTON REVETMENT
MISSOURI BEND REVETMENT
DIKE 1
DIKE 2
DIKE 3
DIKE 4
DIKE 5
AREA
AREA

Figure 13. Survey blocks within the project area, showing depths and survey track lines.

level of the boat launches in Baton Rouge. A suitable launch was found in Port Allen, bringing the 7 m (24 ft) survey boat through the Port Allen locks.

Radically variable water depths in the project area also affected the outcome of the survey. With water depths ranging from 20 to 197 m (6 to 60 ft), it was impossible to maintain the sensor at a consistent height above river bottom. As the sensor distance increases from a ferrous object, its detectable magnetic intensity declines drastically.

Two other factors that potentially affect the interpretation of the results of the survey are the modern use of the river and the presence of modern marine-related debris. The survey was fortunate in experiencing little interference from marine traffic, although some brief sections of data were eliminated because of noise from passing barges. A larger problem was the accumulation of flotsam and jetsam along the river bank. An assortment of cables, pipes, steel belted radial tires, rebars, welding rods, scrap iron, and other debris was observed along the bank in the project area. In fact, the lane closest to the shore exhibited nearly continuous magnetic noise that could not be isolated into individual anomalies. In effect, the entire bankline is one large anomaly, making the interpretation of any near-shore anomalies suspect. Similar difficulties have been experienced during other surveys in identical conditions. Pearson and Saltus (1990) noted that a large accumulation of trash along the bank in a survey near Morgan City interfered with their interpretation of magnetic data.

Procedures for Analysis

Irion et al. (1992) provide a detailed discussion of the relative merits of various schemes for analyzing the potential significance of magnetic anomalies. He concludes that most researchers distinguish the magnetic signatures of potentially significant cultural resources from modern debris using a combination of the duration of signatures and the clustering of three or more anomalies in a 50,000 square m area that has been surveyed at 50 m intervals. This analytical process was developed for the active coastlines of Florida and Texas and was applied to the analysis of magnetic data from Breton Sound off the coast of Louisiana (Irion et al. 1992:61). To date, insufficient investigation has been done to test the veracity of this hypothesis in the waters of the Mississippi, although logic would suggest that a different analytical system should be applied to account for the different set of variables that exist between shipwrecks offshore and those in the Mississippi River. These variables include the potential for much smaller vessels, the likelihood of fewer wreck scattering events, and the potential for vessels such as batteaux, flatboats, and keelboats with few or no iron fasteners.

The causes of wreck formation in the Mississippi River are far different from the causes that might be observed in association with wrecks at sea. Many of the wrecks examined by archeologists off the Texas and Florida coasts, for example, were dashed to pieces as they were driven ashore by storms, an unlikely occurrence in the Mississippi River. A cursory examination of any listing of Mississippi River wrecks (e.g., Berman 1973) makes it apparent that the majority of river craft succumbed to snags, collisions, boiler explosions, and fire. Little dispersion of material would be expected from sinkings caused by snags or collisions where a sudden loss of hull integrity probably would result in the vessel sinking relatively quickly. Snags, unlike collisions, normally would occur only in shallow water where, in most instances, the cargo and the machinery could be salvaged and, very often, the vessel could be raised and repaired.

Boiler explosions and fires present a radically different scenario. A boiler explosion was a particularly cataclysmic event that was akin to detonating a bomb inside the ship. The many vivid accounts of boiler explosions describe an initial scattering of material combined with the formation of a trail of debris as the vessel drifts and burns; these events finally end as the hull loses buoyancy and sinks (Lloyd 1856). In this scenario, material associated with the wreck potentially could be scattered for a mile or more.

Clearly, no single definition of what constitutes the signature of a significant site in the Mississippi River can be derived, since the potential variables are too great. Pearson et al. (1991:70) contends that the smaller vessels that one would be more prone to find in a river setting still would produce a characteristic multiple anomaly composed of a cluster of dipoles and monopoles, even though such a cluster is a function of the proximity of the sensor to the wreck. At greater distances from the sensor, the entire wreck would be detected as a single source and would produce a simple dipolar signature. At the same time, accumulated debris can mask or even simulate shipwreck signatures.

As a result, other historical and environmental considerations must be brought to bear in the analysis of magnetic anomalies detected in a riverine environment. Several remote sensing studies in Louisiana (e.g., Pearson and Saltus 1990; Pearson et al. 1991; Saltus 1985, 1986, and 1988) have demonstrated conclusively that historic vessel remains are concentrated at landings, wharfs, and communities. Two factors contributed to this relationship: the fact that worn-out vessels generally were abandoned near population centers, and the unfortunate proclivity of high-pressure steam boilers to explode as steam was brought up to move the vessel away from a wharf or landing. The utility of conducting a thorough background analysis to identify such features in the project area clearly is demonstrated by the present study.

Other factors that bear on the interpretation of anomalies in a riverine environment are geophysical in nature, including changes in river course and sedimentation rates. A recent survey by Irion and Heinrich (in preparation) demonstrated that the 882 m (269 ft) long ironclad warship *Louisiana*, which burned and sank in 1862, presently is located in the batture under 131 to 197 m (40 to 60 ft) of sand and clay. This deposit was formed after the river built out from the bank and covered the wreck. Major differences between the historic river courses and its present channel also can occur as a result of river migration. Careful comparison between modern and historic charts of the project area have been found to be effective in concentrating research efforts (Goodwin et al. 1992).

These many variables have been taken into account in isolating potentially significant anomalies from modern debris recorded during the Red Eye Crossing survey. As noted in Chapter II, the project area also is located near historic Laurel Place and Cottage Plantation. The project area possesses a high potential for containing submerged cultural resources. These resources are most likely to relate to wharfs or landings associated with these plantations and to steam navigation of the river. In addition, research indicates the presence of two vessels within the project area: a late twentieth century spud barge and the sidewheel steam packet *Princess* that sank in 1859. Both vessels contain massive amounts of ferrous material and should be detected easily with a magnetometer. Additionally, no appreciable change has occurred within the Mississippi's channel in this reach over the past century, suggesting a low sedimentation rate; thus, there is an excellent probability that both wrecks would produce an acoustic signature as well as a magnetic one.

As a result, the following criteria are employed to assess the potential significance of remote sensing targets:

- Duration. Pearson et al. (1991) indicates that riverine watercraft of moderate size were found to produce a magnetic signature 262 to 295 m (80 to 90 ft) across the smallest dimension. At the boat speed maintained during the present survey, approximately 30 seconds would be required to cross this distance. Thus, anomalies of 30-second or greater duration may possess significance.

- Magnetic Field Strength. Magnetic field strength alone generally is regarded as a poor indicator of potential significance. However, when combined with duration, it is suggestive of association with historic watercraft. Since historical research suggests that shipwrecks in the project area are most likely to take the form of steamboats containing a significant mass of iron, only anomalies with a signal strength greater than 50 gammas are considered potentially significant.

- Magnetic Clusters. In order to be considered significant, anomalies must be associated in a cluster with two or more other anomalies appearing on adjacent track lines. This association will serve to eliminate isolated objects from further consideration.

These three criteria, duration of signature, field strength of signature, and patterning of anomalies, form the basis for sorting potentially significant anomalies from isolated modern debris.

CHAPTER VI

RESULTS AND RECOMMENDATIONS

Survey Results

A total of 68 magnetic anomalies were recorded during survey at Red Eye Crossing (Table 1). Twenty-nine of these anomalies were concentrated in eight clusters, designated Clusters A through H (Figure 14, see back pocket of this report). The remaining 39 anomalies were isolated finds. Two of the clusters, B and D, were associated with acoustic targets that aided in their identification. Cluster B is a wreck marked on modern navigation charts of the Mississippi River (Nautical Chart 11370). At "Mile 224 above the Head of the Passes [approximately] 200 to 250 yards from the left descending bank," is reported to be the wreck of a spud barge sunk in 1979 (Eighth Coast Guard District, Navigation Bulletin No. 79-4). Cluster D is believed to represent the remains of the sidewheel steam packet *Princess*, a potentially significant cultural resource. Analyses and recommendations of each cluster are presented below.

Cluster A

Cluster A is located between Dikes 1 and 2 in the upriver end of the project area (Figure 14). It comprises three anomalies: 41, 45, and 46. These anomalies exhibit only weak, undiagnostic magnetic signatures of brief duration. Geomorphological research suggests that this area eroded into the river after ca. 1921 (Chapter II). Due to the recency of the of the river bottom here, this cluster of anomalies has little potential to contain significant cultural resources; no further investigations are recommended.

Cluster B

Cluster B contains Anomalies 35, 58, 59, and 63; it is located between Dikes 2 and 3 in the upriver end of the project area, in about 14 m (45 ft) of water. A very strong perturbation of the magnetic field was recorded at Anomaly 63, which registered 520 gammas in a bipolar signature with a duration of 100 seconds. This cluster apparently derives from a spud barge reported sunk to the U.S. Coast Guard at this approximate location in 1979. The acoustic record shows a large scour pit with one perfectly straight edge. It would appear that the barge has been covered by river sediments; however, the current has scoured a pit in front of the upstream face of the barge. Since the wreckage is modern in origin, no further investigation is recommended.

Cluster C

Six anomalies comprise Cluster C: 28, 37, 38, 39, 42, and 47. The cluster is located in near shore shallow waters, between Dikes 2 and 3 (Figure 14). Anomaly 28, nearest the shore, registered the greatest magnetic perturbation of 265 gammas; it demonstrated a bipolar signature with a duration of 215 seconds. Like Cluster A, Cluster C also falls within an area that had eroded into the river after the first quarter of the twentieth century. Because the strongest magnetic anomalies are near or at the present shoreline, the cluster probably represents an accumulation of modern ferrous debris, perhaps related to a barge fleet that was observed moored during the survey. No further work is recommended at Cluster C.

Table 1. Magnetic and Acoustic Anomalies.

NUMBER	GAMMAS	TYPE	DURATION	SONAR
1	30	Bipole	20	
2	38	Bipole	30	
3	114	Bipole	20	
4	23	Positive	17	
5	170	Bipole	35	
6	20	Multi-component	20	
7	20	Bipole	8	
8	9	Negative	3	
9	11	Positive	9	
10	22	Bipole	15	
11	138	Bipole	13	Small box-like object
12	70	Negative	30	
13	33	Negative	9	
14	14	Negative	12	Cable
15	128	Bipole	20	Cable
16	133	Negative	30	Cable
17	59	Negative	35	Cable
18	28	Bipole	20	Steel drum
19	28	Negative	22	
20	707	Multi-component	120	Cable
21	160	Multi-component	23	
22	69	Multi-component	15	
23	45	Negative	15	
24	34	Positive	10	
25	522	Bipole	13	
26	10	Negative	5	
27	189	Bipole	12	
28	265	Multi-component	215	

Table 1, continued

NUMBER	GAMMAS	TYPE	DURATION	SONAR
29	252	Bipole	53	Cable
30	93	Multi-component	45	4-Meter skiff
31	225	Bipole	20	
32	46	Multi-component	16	
33	63	Bipole	15	
34	72	Bipole	10	
35	82	Bipole	20	
36	91	Bipole	50	
37	168	Bipole	15	
38	63	Bipole	50	
39	55	Bipole	23	
40	166	Multi-component	54	
41	19	Positive	10	
42	94	Positive	12	
43	127	Positive	15	Wreckage, 50 ft to port
44	583	Multi-component	120	
45	19	Negative	15	
46	38	Bipole	22	
47	66	Positive	30	
48	194	Bipole	60	
49	40	Bipole	40	
50	60	Multi-component	90	
51	36	Positive	20	
52	188	Positive	30	
53	42	Multi-component	20	
54	93	Positive	30	
55	55	Multi-component	40	

Table 1, continued

NUMBER	GAMMAS	TYPE	DURATION	SONAR
56	15	Negative	15	
57	82	Negative	45	
58	50	Multi-component	80	
59	33	Negative	45	
60	20	Bipole	20	
61	10	Bipole	10	
62	35	Negative	35	
63	520	Bipole	100	Large scour, possible barge
64	29	Positive	17	
65	35	Bipole	20	
66	50	Bipole	32	
67	26	Positive	20	
68	11	Negative	10	

Cluster D

Cluster D encompasses an area between Dikes 3 and 4 (Figure 14). Four anomalies, including 27, 36, 43, and 48, form this tightly grouped cluster. Two of the anomalies in the cluster, 36 and 48, may be characterized as moderately strong perturbations of relatively long duration. The other anomalies in the cluster exhibit strong magnetic perturbations of brief duration. This type of patterning, wherein magnetic perturbations of long duration cross two survey tracks and are associated with a cluster of smaller anomalies, is characteristic of the type of signature frequently exhibited by shipwrecks. The cluster also falls within an area that has witnessed only slight geophysical changes since the nineteenth century. Its proximity to Cottage Plantation further contributes to its potential as a significant cultural resource.

Furthermore, the acoustic record for this area clearly shows the remains of a wooden hulled vessel with frames curving up from the bottom (Figure 15). Another structure off to the side that is composed of three parallel bands strongly resembles the sonagram of a paddle wheel shaft from the 1850 wreck of the *Columbus* in Chesapeake Bay, excavated by Goodwin & Associates, Inc. in 1992 (Figure 16) (Morrison et al. 1991:48; Irion et al., in preparation). This cluster of anomalies is believed to represent the remains of the 1859 wreck of the sidewheel steamer packet *Princess*.

If indeed this site is the wreck of the *Princess*, it is potentially significant on both the state and national levels under several criteria described in 36 CFR Section 60.4. The *Princess* has been designated Site 16EBR97. The vessel is significant under Criterion A for its associations with the antebellum cotton trade that was fundamental to the economy and life of the southern United States. The *Princess* is a classic representative of the antebellum Mississippi River packet, of which there are no currently surviving contemporary examples.

The vessel also is potentially significant on the state and national levels under Criterion B. Many of the casualties that occurred at the time of its sinking were prominent members of Louisiana society, including two state legislators, a judge, and a sheriff. Representations of the *Princess* are found among the works of nationally prominent contemporary artists Currier and Ives. The reporting of the wreck to the local press was undertaken by Thomas Affleck, author of one of the most famous Southern almanacs, *Affleck's Rural Almanac*.

The vessel would potentially fulfill the requirements of Criterion C by embodying the distinctive characteristics of a type, period, and method of construction for which there are no surviving parallel examples. The *Princess* was considered to be the prime example of a Mississippi River packet by her contemporaries. In fact, her image served as the archetype for steamboat illustrations used on handbills throughout the period. She also was prized for her speed. Her record passage in 1857 from Natchez to New Orleans of 17 hours 30 minutes was not surpassed until 1870, indicating a very successful combination of hull design and power plant that represents the work of a master boatbuilder. Her swiftness earned her mention in Mark Twain's *Life on the Mississippi*.

The wreck of the *Princess* represents the only known example of one of the famous "floating palaces" associated indelibly with mid-nineteenth century Southern history. These vessels characterize a period of American history that has been romanticized in art and literature the world over. The wreck of the *Princess* could offer a rare opportunity to study the construction, engineering, and contents of such a vessel. As a result, the site would be clearly significant under Criterion D.

Cluster D was re-surveyed on January 15, 1993, during high water conditions. The level of the Mississippi River was up 8 m (23.5 ft) at the Baton Rouge gauge over its level the previous November (a level of 2.5 m (8.1 ft) was recorded at Baton Rouge on November 11, 1992; 9.6 m (31.6 ft) was measured

Figure 15. Sonagram of wooden wreckage believed to be the *Princess*.

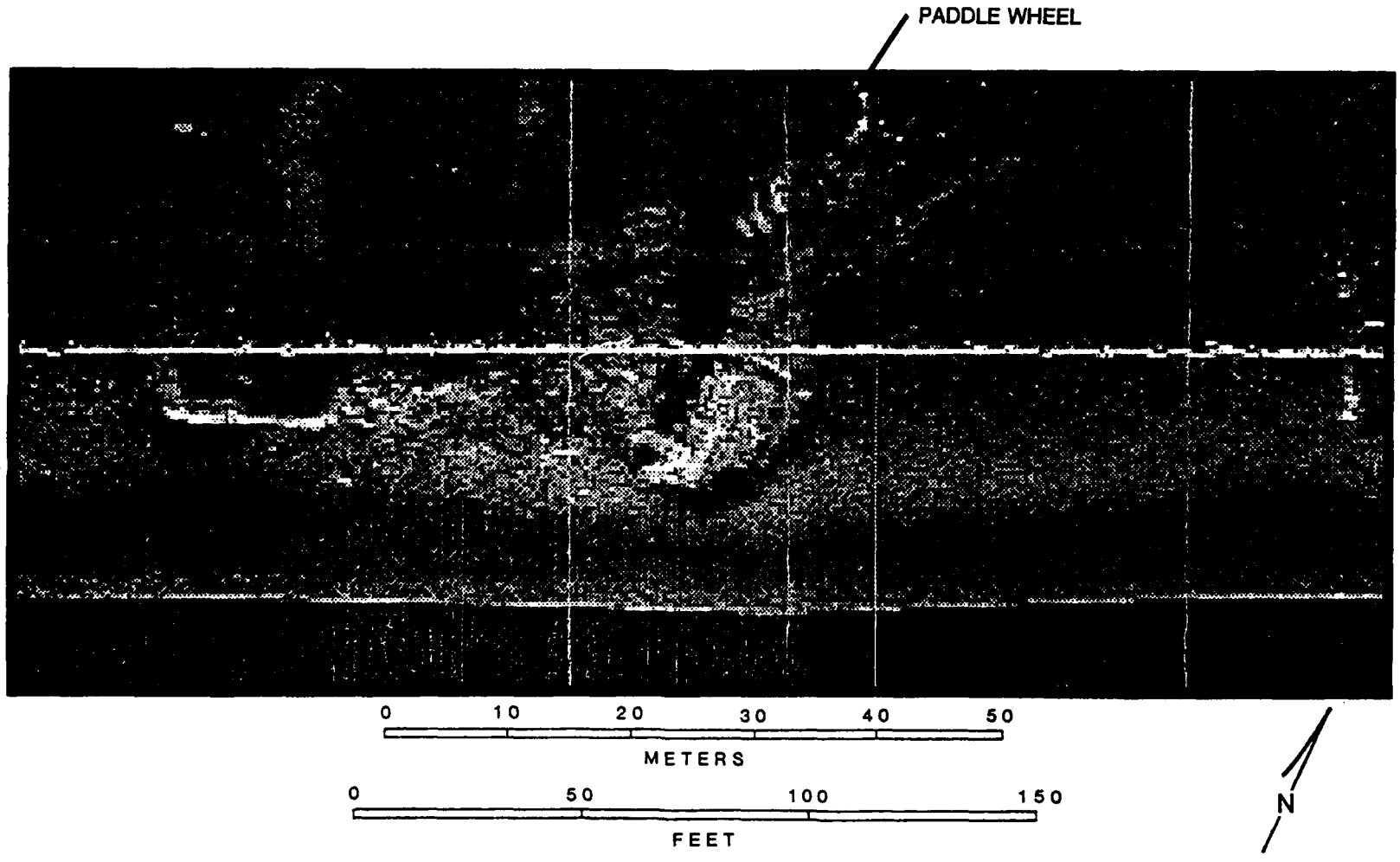


Figure 16. Sonogram of the wreck of the *Columbus*, showing the paddlewheel.

on January 15, 1993). This permitted access into what had been shoal water during the initial survey conducted in November and facilitated the acquisition of a more accurate position for the site.

A survey grid was established over the general area of the site with the coordinate E 2 031 681.9697 / N 618532.9 as the central focus.of a 10,000 m^2 block. The block was surveyed along track lines spaced 15 m apart. Positioning control was supplied by a Trimble DGPS unit. A base station unit was set up at Corps of Engineers benchmark 22A to transmit differential corrections to the mobile receiver.

The close-interval survey revealed that the wreck lies perpendicular to the bank and partially exposed in about 9 m (28 ft) of water, meaning it had less than 1.3 m (4.5 ft) of water over it in November, 1992. The associated fathometer chart clearly shows a the type of scour commonly associated with exposed wreckage at shot point #20 (Figure 17). Debris appears to be scattered downstream from the main wreck site with a second concentration near shot point #11, about 122 m (400 ft) away. The sand bar that prevented the survey of this track in November, and, that may have been the very bar described in eyewitness accounts of the sinking of the *Princess*, is clearly seen at shot point #5 with only 1.6 m (5.5 ft) of water over it. It lies at a distance of about 200 yards downstream of the wreck site. A magnetic map of the survey area (Figure 18) suggests that the wreck scatter extends downriver along the shoreline from the sandbar for a distance of about 229 m (750 ft). The primary wreck concentration lies near coordinate E 2 032 000.7597 / N 618751.11.

It is difficult to state with absolute confidence that the sonar image associated with Cluster D is the wreck of the *Princess*. By the same token, underwater archeological investigation of this site in its present environment would be extremely problematic. Located in the main stream of the Mississippi, and subjected to swift currents estimated at greater than 4 mph (U.S. Army Corps of Engineers, New Orleans District, personal communication 1992), scientific diving on the site, at best, would be difficult and dangerous. Moreover, the turbidity of the water precludes other means of identification such as remotely operated video cameras. However, diving may be possible within the protection of the contraction dikes after they are in place. To that end, it is recommended that the presumed wreck be avoided with a minimum buffer of 91 m (300 ft) maintained around the site.

The construction of the contraction dikes will change the hydrology of the area significantly. It is possible that this will benefit the preservation of the presumed wreck by protecting it from the full force of the current, and by depositing sediment on top of it. Nevertheless, periodic monitoring of the effects of the changes in sedimentation rates in the vicinity of the presumed wreck should be undertaken, to assure its preservation in place.

Cluster E

Cluster E consists of a tight grouping of five anomalies: 24, 25, 26, 33, and 34 near the bankline between Dikes 3 and 4. All of the anomalies in this cluster may be characterized as weak and brief perturbations of the magnetic field, probably caused by a clustering of individual ferrous objects. Their location immediately downstream from the putative site of the *Princess* offers some cause for concern. It is conceivable that this cluster represents wreck scatter associated with the main site. Therefore, efforts should be made to avoid this cluster during construction.

Cluster F

Four anomalies, 21, 22, 30, and 31, are contained within Cluster F located immediately downstream from Dike 4. These anomalies may be characterized as moderately strong to strong in nature, and of relatively brief duration. The exception is Anomaly 30, which exhibits a 93 gamma magnetic deviation in a

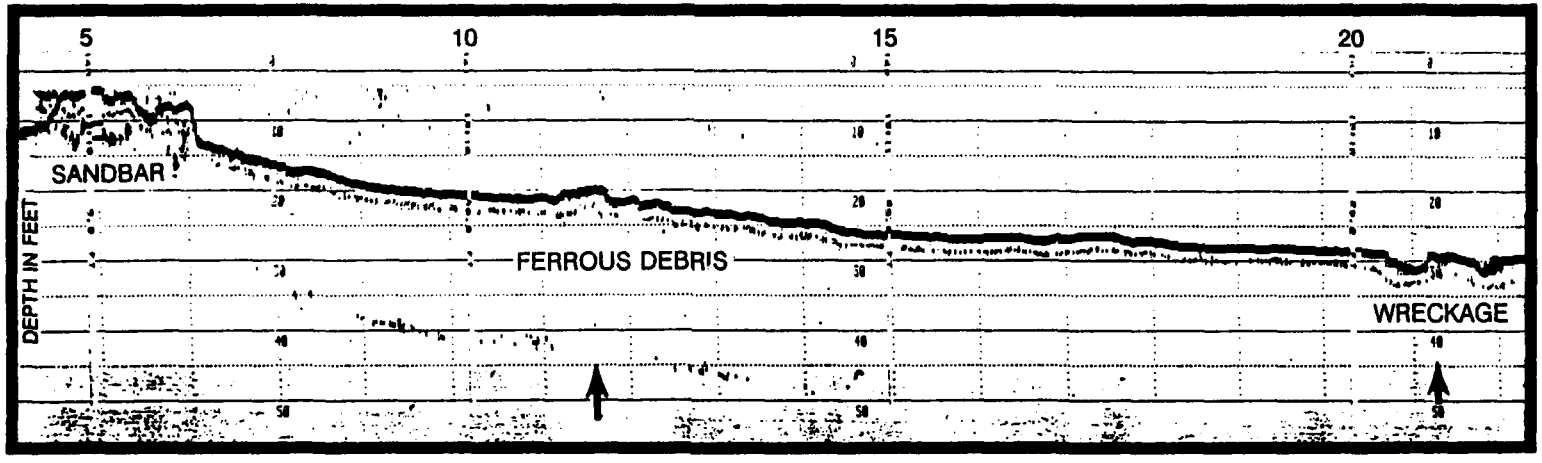


Figure 17. Fathometer chart showing the wreckage believed to be the *Princess*.

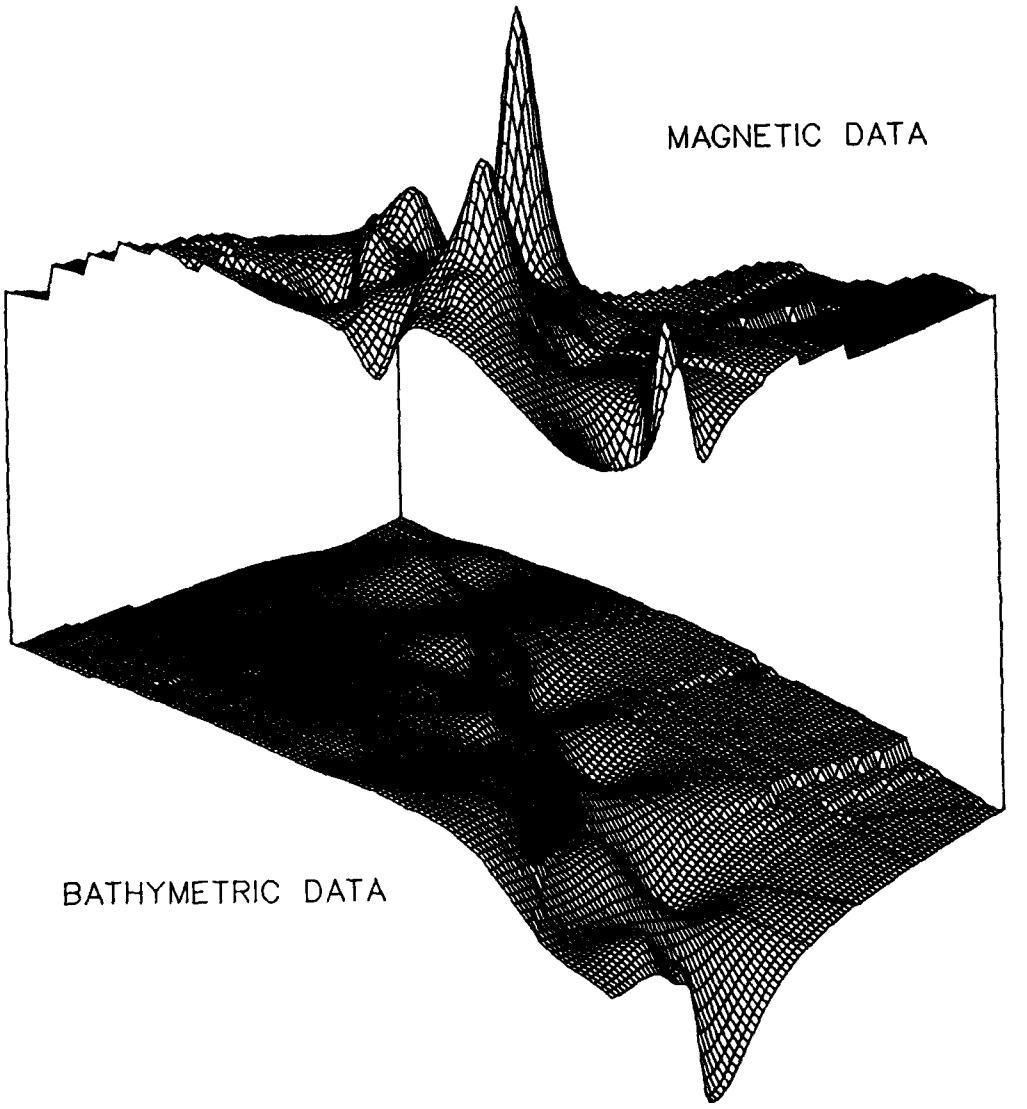


Figure 18. Magnetic contour map of the site of the *Princess*

multicomponent signature for 45 seconds, a distance of about 54 m (180 ft). This type of signature commonly is associated with small wooden hulled craft. However, the acoustic record for this track shows what appears to be a small 4-m (15-ft) outboard skiff. The magneto in the outboard engine, and the proximity of the sensor to the source, could account for the magnetic readings in this area. The site does not appear to be historic in character; no further investigation is recommended.

Cluster G

Cluster G is comprised of three very strong magnetic perturbations of long duration located at the bankline near Dike 5. The acoustic record of this area shows an anomalous zone of scattered debris, including several strands of wire cable, one of which is parallel to the bank and measures over 50 m long. A road that crosses the levee terminates at the water's edge adjacent to this cluster, suggesting that the area has been subjected to modern contamination. This cluster appears to be modern in origin; no further work is recommended.

Cluster H

Cluster H is composed of Anomalies 12, 14, 15, 16, and 17 located between Dikes 5 and 6. This cluster is characterized by moderately strong (over 50 gamma) anomalies of significant duration. The acoustic record shows an uncharacteristic bottom disturbance associated with what appears to be wire cable, which appears to explain the magnetic signature. Therefore, no further work is recommended for this cluster.

Summary of Findings

The proposed Red Eye Crossing project area was found to contain a total of 68 magnetic anomalies. Twenty-nine of these anomalies appear to be grouped into eight clusters, presumably indicating a potential association with eight common events. Clusters A, B, C, F, G, and H are interpreted as representations of recent depositional events for which no further work is recommended.

The remains of a wooden-hulled vessel were visible in the sonagram of Cluster D. Based on historical documentation, it is hypothesized that this wreckage is associated with the steam packet *Princess* (16EBR97). Cluster E, which is immediately downstream of the wreckage, could be associated wreck scatter. The planned construction should have no effect on this site, provided an adequate buffer is maintained between construction and the presumed wreck. Any resultant sedimentation should help to preserve the site in place. Finally, after the dikes are in place, archeological testing could take place within their protection, if conditions change or if scientific analyses become desirable or warranted.

REFERENCES CITED

Affleck, Thomas
1859 The Catastrophe on the Princess. *New Orleans Daily Picayune*, March 1 PM:1 and March 2 PM:1.

Autin, Whitney J., Scott F. Burns, Bobby J. Miller, Roger T. Saucier, and John I. Snead
1991 Quaternary Geology of the Lower Mississippi River Valley. In *Quaternary Nonglacial Geology, Conterminous U.S.*, edited by R. B. Morrison, pp. 20-56, *The Geology of North America*, Vol. K-2, Geological Society of America, Boulder.

Bannon, Lois Elmer, Martha Yancey Carr, and Gwen Anders Edwards
1984 *Magnolia Mound: A Louisiana River Plantation.* Pelican Publishing Company, Gretna, Louisiana.

Baton Rouge *Morning Advocate*
1960 Fire Marshal's Office Probes Blaze Causes at The Cottage Here. *Morning Advocate* February 19. Article on file, Louisiana Scrapbook 55:29, Louisiana Collection, Tulane University, New Orleans.

Baton Rouge *Weekly Advocate*
1859 An Awful Calamity! Explosion and Burning of the *Princess*. March 6:3.

Beard, David V.
1992 *Causeways and Landings: Assessing the Archaeological Potential of Riverine Adaptations.* Unpublished paper presented to the South Carolina Historic Landscapes Synthesis Project. Slated for publication, fall 1992.

Berman, Bruce D.
1973 *Encyclopedia of American Shipwrecks.* The Mariners Press, Boston.

Bouchereau, Louis and Alcee
1869-1901 *Statement of the Sugar and Rice Crops Made in Louisiana.* Pelican Steam Book and Job Printing, New Orleans.

Brasseaux, Carl A.
1987 *The Founding of New Acadia: The Beginnings of Acadian Life in Louisiana, 1765-1803.* Louisiana State University Press, Baton Rouge.

Burgess, George W.
1917-1918 The Ram *Arkansas* and the Battle of Baton Rouge. *Proceedings of the Historical Society of East and West Baton Rouge* 2:34-37.

Burns, Francis P.
1932 West Florida and the Louisiana Purchase, an Examination into the Question of Whether It Was Included in the Territory Ceded by the Treaty of 1803. *The Louisiana Historical Quarterly* 15:391-416.

Carleton, Mark T.
1981 *River Capital: An Illustrated History of Baton Rouge.* Windsor Publications, n.c.

Casey, Powell A.
1983 *Encyclopedia of Forts, Posts, Named Camps, and Other Military Installations in Louisiana, 1700-1981.* Claitor's Publishing Division, Baton Rouge.

Caughey, John
1932 Willing's Expedition Down the Mississippi, 1778. *The Louisiana Historical Quarterly* 15:5-36.

Cayton, Frank M. (compiler)
1881 *Landings on All the Western and Southern Rivers and Bayous.* Woodward, Tiernan, and Hale, St. Louis.

Chambers, Henry E.
1898 West Florida and Its Relation to the Historical Cartography of the United States. In *Anglo-American Relations and Southern History*, pp. 2-59. Johns Hopkins University Studies in Historical and Political Science, vol. XVI, No. 5. The Johns Hopkins Press, Baltimore.

Champomier, P. A.
1852-1862 *Statement of the Sugar Crop Made in Louisiana.* Cook, Young and Company, New Orleans.

Chapelle, Howard I.
1951 *American Small Sailing Craft.* W. W. Norton & Company, New York.

Colomb, R. W. (translator)
1931 Lafayette's Visit to Baton Rouge, April, 1825. *The Louisiana Historical Quarterly* 14:178-181.

Conrad, Glenn R. (general editor)
1988 *A Dictionary of Louisiana Biography*, Vol. I. The Louisiana Historical Association, in cooperation with The Center for Louisiana Studies of the University of Southwestern Louisiana, Lafayette, Louisiana.

Coulter, E. Merton (editor)
1960 *Confederate Receipt Book: A Compilation of Over One Hundred Receipts, Adapted to the Times.* Republished. The University of Georgia Press, Athens. Originally published 1863, West & Johnston, Richmond, Virginia.

Dalrymple, Margaret Fisher (editor)
1978 *The Merchant of Manchac: The Letterbooks of John Fitzpatrick, 1768-1790.* Louisiana State University Press, Baton Rouge.

Dance, Ray E., B. I. Griffis, B. B. Nutt, A. G. White, and S. A. Lytle
1968 *Soil Survey East Baton Rouge Parish.* U.S. Department of Agriculture, Soil Conservation Service, Alexandria, Louisiana.

Dart, Henry P. (editor)
1929 West Florida: Documents Covering a Royal Land Grant and Other Land Transactions on the Mississippi and Amite Rivers during the English Rule. *The Louisiana Historical Quarterly* 12:630-644.

1930 The British Proclamation of October 7, 1763, Creating the Government of West Florida. *The Louisiana Historical Quarterly* 13:610-616.

Davies, David K.
1966 Sedimentary structures and subfacies of a Mississippi River point bar. *Journal of Geology* 74:234-239.

Davis, Edwin Adams
1971 *Louisiana, A Narrative History.* 3rd edition. Claitor's Publishing Division, Baton Rouge.

Detro, Randall A., Donald W. Davis, and Francine Middleton
1979 *Mississippi River Ship and Boat Sinkings from the Delta to Baton Rouge, 1814 to 1979.* Submitted to the U.S. Corps of Engineers, New Orleans District.

Ditchy, Jay K. (translator)
1930 Early Census Tables of Louisiana. *The Louisiana Historical Quarterly* 13:205-229.

Eighth Coast Guard District
1979 *Navigation Bulletin* No. 79-4.

Ellis, Frederick S.
1981 *St. Tammany Parish, L'Autre Côté du Lac.* Pelican Publishing Company, Gretna, Louisiana.

Farrell, Kathleen M.
1989 *Stratigraphy and Sedimentology of Holocene Overbank Deposits of the Mississippi River, False River Region, Louisiana.* Unpublished Ph.D. thesis, Department of Geology, Louisiana State University, Baton Rouge.

Fenneman, Nevon M.
1938 *Physiography of the Eastern United States.* McGraw-Hill Book Company, New York.

Ferring, C. Reid
1986 Rates of fluvial sedimentation: their implication for archaeological variability. *Geoarchaeology* 1:259-274.

Fisk, Harold N.
1944 *Geological Investigation of the Alluvial Valley of the Lower Mississippi River.* Mississippi River Commission, U.S. Army Corps of Engineers, Vicksburg District.

1947 *Fine-Grained Alluvial Deposits and their Effects on Mississippi River Activity.* Mississippi River Commission, U.S. Army Corps of Engineers, Vicksburg District.

Flores, Romero M., Frank G. Ethridge. Andrew D. Miall, William E. Galloway, and Thomas D. Fouch
1985 *Recognition of fluvial systems and their resource potential.* SEPM Short Course No. 19. Society for Sedimentary Geology, Tulsa.

French, B. F. (editor and translator)
1875 *Historical Collections of Louisiana and Florida, Including Translations of Original Manuscripts Relating to Their Discovery and Settlement, with Numerous Historical and Biographical Notes.* Albert Mason, New York.

Gagliano, Sherwood, and Perry C. Howard
1984 The Neck Cutoff Cycle Along the Lower Mississippi River. In *River Meandering*, edited by C. M. Elliot, pp. 147-158, American Society of Civil Engineers, New York.

Gagliano, Sherwood M., Richard A. Weinstein, Eileen K. Burden, Susan Fulgham, and Charles Wax
1977 *Cultural Resources Testing at 16 EBR 35, Manchac Bend, East Baton Rouge Parish, Louisiana.* Submitted by Coastal Environments, Inc., to the U.S. Army Corps of Engineers, New Orleans District.

Glander, Wayne, and Sherwood M. Gagliano
1977 *Cultural Resource Survey of Proposed Scallan Brothers Borrow Pit 493+00-500+00, East Bank, Mississippi River, East Baton Rouge Parish.* Submitted by Coastal Environments, Inc. to Scallan Bros. Contractors.

Goodwin, R. Christopher, Peter A. Glendel, and Jill Karen Yakubik
1983 *Archeological Assessment of Two Sites on the Mississippi River: 16PC33 and 16EBR46.* Submitted by R. Christopher Goodwin and Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, Paul V. Heinrich, William P. Athens, and Stephen Hinks
1991 *Overview, Inventory, and Assessment of Cultural Resources in the Louisiana Coastal Zone.* Submitted by R. Christopher Goodwin and Associates, Inc. for Contract SPF Number 25101-90-09 to Coastal Management Division Department of Natural Resources, Baton Rouge.

Goodwin, R. Christopher, Stephen Hinks, William P. Athens, Lawrence L. Hewitt, and William A. Morgan
1990a *Literature Search and Research Design, Amite River and Tributaries Project, Ascension, East Baton Rouge, and Livingston Parishes, Louisiana.* Submitted by R. Christopher Goodwin & Associates, Inc., to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, Stephen Hinks, William P. Athens, James M. Wojtala, Paul C. Armstrong, Jennifer A. Cohen, Julie McClay, and William Morgan
1990b *Cultural Resources Survey of Missouri Bend and Plaquemine Bend Revetment Items, West Baton Rouge and Iberville Parishes, Louisiana.* Submitted by R. Christopher Goodwin and Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, James M. Wojtala, William P. Athens, Susan Barrett Smith, Ralph Draughon, Jr., Paul Heinrich, and William Morgan
1992 *Testing and Survey of Seven Items on the Red River in Pool 3, Red River Waterway, Louisiana.* Prepared for U.S. Army Corps of Engineers, Vicksburg District, by R. Christopher Goodwin & Associates, Inc., New Orleans District.

Greene, Jerome A., A. Berle Clemenson, John C. Paige, David R. Stuart, and Lawrence F. Van Horn
1984 *Mississippi River Cultural Resources Survey: A Comprehensive Study, Phase I, Component B: Cultural Resources Site Inventory*, Vol. 3. Submitted by the Southeast/Southwest Team, National Park Service, Denver Service Center for the U.S. Army Corps of Engineers, New Orleans District.

Hansen, Harry (editor)
1971 *Louisiana: A Guide to the State.* New rev. ed. Hastings House, New York. Originally published 1941, Louisiana Library Commission at Baton Rouge.

Heck, Robert W.
1970 *Historic Baton Rouge: An Urban Planning Perspective for the Preservation of Its Heritage.* Submitted by Robert W. Heck, Professor of Architecture, Louisiana State University, to the Community Renewal Program for the City of Baton Rouge and the Parish of East Baton Rouge, Louisiana.

Heinrich, Paul V.
1991 A sedimentological explanation for the distribution of archaeological sites in a meander belt as stated by the "relict channel rule." *Transactions of the Gulf Coast Association of Geological Societies* 41:320.

Henry, Adolphe, and Victor Gerodias
1857 *The Louisiana Coast Directory of the Right and Left Banks of the Mississippi River, from Its Mouth to Baton Rouge.* E. C. Wharton, New Orleans.

Huguet, Florence Ballantine
1976 *The Dutch Highlanders.* Baton Rouge Bicentennial Commission, Baton Rouge.

Irion, Jack B. and David V. Beard
In prep *Phase III Investigation of the Steamship "Columbus," 18ST625, Chesapeake Bay, Maryland.* To be submitted to the U.S. Army Corps of Engineers, Baltimore District, by R. Christopher Goodwin & Associates, Inc., Frederick, Maryland.

Irion, Jack B., Peter Morrison, Paul V. Heinrich, and Danton Kostandarithes
1992 *Remote Sensing Survey of Mississippi River-Gulf Outlet, Breton Sound Disposal Area, Plaquemines Parish, Louisiana.* Submitted to the U.S. Army Corps of Engineers, New Orleans District by R. Christopher Goodwin & Associates, Inc., New Orleans.

Irion, Jack B. and Paul V. Heinrich
In prep *Remote Sensing Survey and Testing of Anomalies at Fort St. Philip, Plaquemines Parish, Louisiana.* In preparation for the U.S. Army Corps of Engineers, New Orleans District, by R. Christopher Goodwin & Associates, Inc., New Orleans.

Jennings, Virginia Lobdell
1974 *The Plains and the People: A History of Upper East Baton Rouge Parish.* 1st revised ed. Claitor's Publishing Division, Baton Rouge.

Johnson, Cecil
1933 The Distribution of Land in British West Florida. *The Louisiana Historical Quarterly* 16:539-553.

1971 *British West Florida, 1763-1783.* Reprinted. Archon Books. Originally published 1942, Yale University Press, New Haven.

Jones, Dennis, Joann Mossa, F. Todd Smith, Brady Banta, and Jeff Treffinger
1990 *A Cultural Resources Survey of Arlington Revetment and LSU Berm Levee Improvement Item, East Baton Rouge Parish, Louisiana.* Submitted by the Museum of Geoscience, Louisiana State University, Baton Rouge, to the U.S. Army Corps of Engineers, New Orleans District.

Jones, Dennis, Joanna Mossa, F. Todd Smith, Brady Banta, Jeff Treffinger, Melissa Wiedfeld, Jill-Karen Yakubik
1992 *A Cultural Resources Survey of Arlington Revetment and LSU Berm Levee Improvement Item, East Baton Rouge Parish, Louisiana.* Report by Louisiana State University Museum of Geoscience for Contract No. DACW29-88-D-0123, U.S. Army Corps of Engineers, Vicksburg District.

Kellough, Elizabeth, and Leona Mayeux
1979 *Chronicles of West Baton Rouge.* Kennedy Print Shop, Baton Rouge.

Kerr, Ed., and Elmore Morgan
1951 *5 Days in Baton Rouge.* Henry Louis Cohn, n.c.

Keyes, Frances Parkinson
1945 *The River Road.* Julian Messner, New York.

Kolb, Charles R.
1962 *Distribution of Soils Bordering the Mississippi River from Donaldsonville to the Head of Passes.* U.S. Army Corps of Engineer Waterways Experimental Station Technical Report 3-601, U.S. Army Corps of Engineer Waterways Experimental Station, Vicksburg District. Laughlin, Clarence John

Laughlin, Clarence John
1951 *Ghosts along the Mississippi: An Essay in the Poetic Interpretation of Louisiana's Plantation Architecture.* Charles Scribner's Sons, New York.

Lloyd, James T.
1856 *Lloyd's Steamboat Directory and Disasters on the Western Rivers.* James T. Lloyd, New York.

Louisiana Traveler
1955 River Road Plantation Was Upriver Cottage. *Louisiana Traveler* May-June. Article on file, Louisiana Scrapbook 67:69, Louisiana Collection, Tulane University, New Orleans.

Mathewson, Christopher C.
1992 Logic-based qualitative site decay model for the preservation of archaeological sites. *In Interdisciplinary Workshop on the Physical-Chemical-Biological Processes Affecting Archeological Sites*, edited by Christopher C. Mathewson, pp. 227-238, Waterway Experimental Station Environmental Impact Research Program Contract Report EL-89-1, U.S. Army Corps of Engineers, Vicksburg District.

McLemore, Richard Aubrey (editor)
1973 *A History of Mississippi*, Vol. 1. University & College Press of Mississippi, Hattiesburg.

Menn, Joseph Karl
1964 *The Large Slaveholders of Louisiana - 1860.* Pelican Publishing Company, New Orleans.

Meyers, Rose
1976 *A History of Baton Rouge, 1699 - 1812.* Louisiana State University Press, Baton Rouge.

Morgan, James Morris
1917 *Recollections of a Rebel Reefer.* Houghton Mifflin Company, Boston and New York.

Morrison, Peter H., Stephen R. James, R. Christopher Goodwin, and Michael Pohuski
1991 *Phase II Archeological Investigations of Three Shipwreck Sites in the Baltimore Harbor and Channels Federal Navigation 50 Ft. Project, Chesapeake Bay, Maryland and Virginia.* Submitted to U.S. Army Corps of Engineers, Baltimore District by R. Christopher Goodwin & Associates, Frederick, Maryland.

New Orleans Daily Picayune
1859 United States Tri-Weekly Mail Line to Vicksburg. February 26:8:4.
Dreadful Calamity. February 28:1:7.
The Disaster to the Princess. March 1:1:7.
Miller's Steam Boiler Alarm. March 1:4:2.
Further Details of the Princess Disaster. March 2 PM:1.
Further Particulars of the Explosion. March 4:1:5.
The State in Mourning. March 7:1:6.
The Dead of Natchez. March 12:1:6.
Letter from Baton Rouge. March 8.

North American Commission on Stratigraphic Nomenclature
1983 North American Stratigraphic Code. *American Association of Petroleum Geologists Bulletin* 67:841-875.

Owens, Harry P.
1990 *Steamboats and the Cotton Economy.* University Press of Mississippi. Jackson.

Owsley, Frank Lawrence, Jr.
1981 *Struggle for the Gulf Borderlands: The Creek War and the Battle of New Orleans, 1812-1815.* University Presses of Florida, Gainesville.

Pearson, Charles E., George J. Castille, Donald Davis, Thomas E. Redard, and Allen R. Saltus
1989 *A History of Waterborne Commerce and Transportation Within the U.S. Army Corps of Engineers New Orleans District and an Inventory of Known Underwater Cultural Resources.* Submitted by Coastal Environments, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

Pearson, Charles E., Bryan L. Guevin and Allen R. Saltus, Jr.
1991 *Remote Sensing Survey of the Lower Pearl and West Pearl Rivers, Louisiana and Mississippi.* Prepared for U.S. Army Corps of Engineers, Vicksburg District, by Coastal Environments, Inc., Baton Rouge.

Pearson, Charles E., and Allen R. Saltus
1990 *Remote Sensing Survey of the Atchafalaya Basin Main Channel Training Projects, Sts. Martin and Mary Parishes, Louisiana.* Submitted by Coastal Environments, Inc. to the U.S. Corps of Engineers, New Orleans District.

Price, C. W., Jr.
1939 Cannon Balls Kept Residents in Fear; Army Took House. *The Progress* March 31.

Rowland, Mrs. Dunbar (Eron Rowland)
1930 *Life, Letters and Papers of William Dunbar.* Press of the Mississippi Historical Society, Jackson.

Saltus, Allen R., Jr.

1985 *Submerged Cultural Resource Investigation of the Maurepas Basin with Intensive Surveys at Warsaw Landing, Blood River, and Springfield Area, Natalbany River, Louisiana.* Submitted to the Division of Archeology, Louisiana Department of Culture, Recreation, and Tourism.

1986 *Submerged Cultural Resources Investigation of the Western Portion of the Maurepas Basin with Intensive Underwater Surveys at Hoo Soo Too Landing, 16 EBR 60, Colyell Bay, Catfish Landing, and at the Mouth of Bayou Chene Blanc.* Submitted to the Division of Archeology, Louisiana Department of Culture, Recreation, and Tourism.

1988 *Submerged Cultural Resources Investigation of Various Waterways of Lake Pontchartrain's North Shore.* Submitted to the Division of Archeology, Louisiana Department of Culture, Recreation, and Tourism.

Saucier, Roger T.

1969 *Geological Investigation of the Mississippi River Area Artonish to Donaldsonville, Louisiana.* Waterways Experimental Station Technical Report No. S-69-4, U.S. Army Corps of Engineers, Vicksburg District.

1974 *Quaternary Geology of the Lower Mississippi Valley.* Arkansas Archaeological Survey Research Series No. 6, Fayetteville.

1981 Current Thinking on Riverine Processes and Geological History as Related to Human Settlement in the Southeast. *Geoscience and Man* 22:7-18.

Saucier, Roger T., and Lawson M. Smith

1986 Late Wisconsinan and Holocene evolution of the Lower Mississippi Valley. *Geological Society of America Abstracts with Program* 18:739.

Saucier, Roger T., and John I. Snead

1989 *Quaternary Geology of the Lower Mississippi River Valley.* Scale 1:1,100,000, Louisiana Geological Survey, Baton Rouge.

Schumacher, B. A., W. J. Day, M. C. Amacher, and B. J. Miller

1988 *Soils of the Mississippi River Alluvial Plain in Louisiana.* Louisiana Experimental Station Bulletin, No. 796, Agricultural Center, Louisiana State University, Baton Rouge.

Schumm, Stanley A., and G. R. Brakenridge

1987 Chapter 10 River responses. In *North America and Adjacent Oceans During the Last Deglaciation*, edited by W. F. Ruddiman and H. E. Wright, pp. 221-240. *The Geology of North America*, Vol. K-3, Geological Society of America, Boulder.

Shafer, Judy, and A. Berle Clemensen

1983 *An Archeological Survey of the Proposed Port Allen Revetment and Levee Project (M-234.5 to 228-R), West Baton Rouge Parish, Louisiana.* Draft submitted by the National Park Service, Denver Service Center, to the U.S. Army Corps of Engineers, New Orleans District, Louisiana.

Shenkel, J. Richard

1976 *Cultural Resource Survey of the Pontchartrain Levee District Levee Enlargement and Concrete Slope Pavement, Item M-227 to 218-L.* Submitted to the U.S. Army Corps of Engineers, New Orleans District.

Spratling, William P., and Natalie Scott
1927 *Old Plantation Houses in Louisiana*. Lent & Graff Co., New York.

Storer, D. Humphries
1828-1829 External Application of Flour to Recent Burns. In *Boston Medical and Surgical Journal*, Vol. 1, pp. 734-735. On file, Medical Library, Tulane University School of Medicine, New Orleans.

Stuart, David R., and Jerome A. Greene
1983 *An Archeological Survey of the Proposed Missouri Bend Revetment (M-221.1 to 219.4-R), West Baton Rouge Parish, Louisiana*. Submitted by the National Park Service, Denver Service Center to the U.S. Army Corps of Engineers, New Orleans District.

Terrel, Bruce G.
n.d. *Louisiana Submerged Cultural Resource Management Plan*. Department of Culture, Recreation and Tourism, Baton Rouge.

Twain, Mark
1911 *Life on the Mississippi*. Reprinted. Harper & Brothers, New York. Originally published 1883, James R. Osgood & Company, Boston.

Walker, Roger G., and Douglas J. Cant
1984 Sandy fluvial systems. In *Facies Models*, edited by G. R. Walker, pp. 71-90, Geoscience Canada Reprint Series No. 1, Geological Association of Canada, Toronto.

The Waterways Journal
1954 Clipping in the James Merrick Jones Steamboat Collection, Tulane University, New Orleans, Louisiana.

MAPS

Bayley
1853 *New and Improved Map of Louisiana*. Map on file, Library of Congress, Washington, D.C.

Boyd, R. W.
1849 *Map of Louisiana, Subdivided into Townships*. Dr. Hunter, New Orleans. Microfilm copy on file, Regional Archives, Sandell Library, Northeast Louisiana University, Monroe, Louisiana.

D'Anville
1752 *Carte de la Louisiane*. Map on file, Library of Congress.

Des Barres, Joseph F. W.
1779 *Mississippi River, From Iberville to . . . 1779 Land on the River Mississippi, River Amit, Etc.* Map on file, Archives, Hill Memorial Library, Louisiana State University, Baton Rouge.

Louisiana Surveyor General
1859 Township Plat: T8S, R1W, Greensburg District, Louisiana. Map on file, Division of State Lands, Department of Natural Resources, Baton Rouge.

Mississippi River Commission (MRC)

1879-1880 *Survey of the Mississippi River*, Chart Nos. 66 and 67. Maps on file, Planning Division, U.S. Army Corps of Engineers, New Orleans District.

1907 *Map of the Mississippi River from the Mouth of the Ohio River to the Head of the Passes*, Sheet No. 25. 3rd edition. Originally published 1884, Mississippi River Commission. Map on file, U.S. Army Corps of Engineers, New Orleans District.

1921 *Survey of the Mississippi River*, Chart Nos. 66 and 67. Maps on file, Planning Division, U.S. Army Corps of Engineers, New Orleans District.

1939 *Maps of the Mississippi River Angola, Louisiana to the Head of Passes Scale 1:20,000*. U.S. Army Corps of Engineers, New Orleans District.

1951 *Mississippi River Hydrographic Survey 1949-1952 Angola, Louisiana to Head of Passes, Louisiana. Scale 1:20,000 And South and Southwest Passes and Pass A Loutre Scales 1:10,000 and 1:20,000*. U.S. Army Corps of Engineers, New Orleans District.

1983 *Mississippi River Hydrographic Survey 1983-1985 Blackhawk, Louisiana to Head of Passes, Louisiana. Mile 0 to Mile 324 (A. H. P.) Scale 1:20,000 And South and Southwest Passes and Pass A Loutre Scales 1:10,000 and 1:20,000*. U.S. Army Corps of Engineers, New Orleans District.

Morales, Don Juan Bentura

1799 *Mapa de las Locaciones del Distrito de Manchack*. Microfilm copy on file, Historic New Orleans Collection, Pintado Papers, Folder 11, Roll 6, Frame 22.

Norman

1858 *Plantations on the Mississippi River from Natchez to New Orleans*. Reprint. Pelican Publishing Company, Gretna, Louisiana.

Pintado Papers

ca. 1810 *Mississippi River: Rio Iberville to Thompson's Creek*. Microfilm copy on file, Historic New Orleans Collection, Pintado Papers, Folder 8, Roll 6.

Porter, Thomas

1839 *Homo-Graphic Chart of the Settlements on the Mississippi River*. Map on file, U.S. Army Corps of Engineers, Vicksburg District.

U.S. Geological Survey

1971 *Plaquemine Quadrangle Louisiana (Topographic)*, 1:24,000, Reston, Virginia.

PERSONAL COMMUNICATION

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APPENDIX I

SCOPE OF SERVICES

SCOPE OF SERVICES
Contract DACW29-92-D-0011
Delivery Order 01

UNDERWATER CULTURAL RESOURCES SURVEY FOR CONTRACTION DIKES AT RED EYE CROSSING, MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LOUISIANA.

1. Introduction

This delivery order calls for a cultural resources investigation at Red Eye Crossing M-224 AHP. The project features include a series of soft dike structures to be built on the riverbed outside of the main navigation channel. The dikes are designed for maintaining the river's navigation channel at a minimum 45 feet depth. Dikes will be constructed outside of and perpendicular to the main navigation channel to maintain alignment and achieve the required depth. Six dikes are proposed at Red Eye Crossing on the left descending bank, ranging in length from 650 to 1750 linear feet. The dikes will tie into the bank and bank protection will be provided for 200 feet upstream and 300 feet downstream to prevent localized scour from flanking the dikes. The need for training works in crossings between New Orleans and Baton Rouge was initially addressed in the feasibility report for the Mississippi River Ship Channel Gulf to Baton Rouge, La report. The work requires background research and survey of the project reach, inventory of all sites within the project reach, assessment of the significance of all sites, and the preparation of comprehensive draft and final reports of investigation for the study. The contract period for this delivery order is 113 days.

2. Study Area

The study area consists of a reach of the river from M-223.3 to 224.7-L, extending from the top of bank to the edge of the navigation channel. See training dike locations shown on the attached maps (File No. H-4-30946).

3. Background Information

General overview information is available for the project vicinity as a result of cultural resources studies conducted for various federally funded or permitted actions. Pertinent cultural resources investigations include Shenkel (1977) and Jones, et al. (1992). A navigational history and an inventory of known shipwrecks in the study area is provided in the report entitled A History of Waterborne Commerce and Transportation within the U.S. Army Corps of Engineers, New Orleans District and an Inventory of Known Underwater Cultural Resources prepared by Coastal Environments, Inc. (1989). The shipwreck inventory lists the 1888 loss of the Laura Lee, and three modern barge losses

at Red Eye Crossing. Waterborne commerce in the river was crucial to the historical development of Louisiana both locally and regionally.

4. General Nature of the Work

The purpose of this study is to locate significant historic shipwrecks which may exist in the project area. The study will employ a systematic magnetometer and side-scan sonar survey of the study area using precise navigation control and a fathometer to record bathymetric data. All potentially significant anomalies located by the survey will be investigated by more intensive survey. All magnetic, bathymetric, and sonar anomalies will be interpreted based on expectations of the character of shipwreck signatures. No diving will be performed under this delivery order.

5. Study Requirements

The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

> the National Park Service's National Register Bulletin 15 entitled, "How to Apply the National Register Criteria for Evaluation";
>
> the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation as published in the Federal Register on September 29, 1983;
>
> Louisiana's Comprehensive Archaeological Plan, dated October 1, 1983;
>
> The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties";
>
> the Louisiana Submerged Cultural Resource Management Plan published by the Division of Archaeology in 1990.

The study will be conducted in three phases: Review of Background Sources, Remote Sensing Survey, and Data Analyses and Report Preparation.

a. Phase 1: Review of Background Sources. This phase is limited to research of available literature and pertinent historical, archival and geomorphological maps and records contained in existing documents. The focus of this work will be to identify historic banklines, landings, and other features which might relate to underwater features. The background work will provide context for features which may be discovered during the course of the survey.

b. Phase 2: Remote Sensing Survey. Upon completion of Phase 1, the contractor shall proceed with execution of the remote sensing fieldwork. The equipment array required for this survey effort is:

(1) a marine magnetometer

(2) a positioning system
(3) a side-scan sonar system
(4) a recording fathometer

The contractor will begin by establishing the shore reference stations for the positioning system. The following requirements apply to the survey:

(1) transect lane spacing will be no more than 150 feet for the magnetometer survey and 600 feet for the sonar survey,
(2) two separate runs will be made along the transects, one with the side scan sonar and another with the magnetometer,
(3) positioning control points will maximize use of existing Corps of Engineers control points and will be obtained at least every 100 feet along transects,
(4) background noise will not exceed +/- 3 gammas,
(5) magnetic data will be recorded on 100 gamma scale,
(6) the magnetometer sensor will be towed a minimum of 2.5 times the length of the boat or projected in front of the survey vessel to avoid noise from the survey vessel,
(7) the survey will utilize the Louisiana Coordinate System,
(8) additional, more tightly spaced, transects will be run over all potentially significant anomalies.

Two copies of a brief management summary will be submitted to the COR within 7 days after completion of the fieldwork (28 days after award). Additional requirements for the management summary are contained in Section 6 of this Scope of Services.

c. Phase 3: Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methods. The post-survey data analyses and report presentation will include as a minimum:

(1) post-plots of survey transects, data points and bathymetry;
(2) same as above with magnetic data included;
(3) plan views of all potentially significant anomalies showing transects, data points and contours;
(4) correlation of magnetic, sonar, and fathometer data, where appropriate.

The interpretation of identified magnetic anomalies will rely on expectations of the character (e.e. signature) of shipwreck magnetics derived from the available literature. Interpretation of anomalies will also consider probable post-depostional impacts and the potential for natural and modern, i.e. insignificant, sources of anomalies. The Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in all draft and final reports for any anomaly classified as a site. The report shall contain an inventory of all magnetic anomalies recorded during the underwater survey, with recommendations for further identification and evaluation procedures when appropriate. These discussions must include justifications for the selection of specific targets for further evaluation. Equipment and methodology to be

employed in evaluation studies must be discussed in detail. The potential for each target or submerged historic property to contribute to archeological or historical knowledge will be assessed. Thus, the Contractor will classify each anomaly as either potentially eligible for inclusion in the National Register, or not eligible. The Contractor shall fully support his recommendations regarding site significance. The report will include a summary table listing all anomalies, the assessment of potential significance and recommendations for further work.

One set of project area maps with the locations of all anomalies accurately plotted thereon will be submitted with the draft reports. The base project maps will be provided by the COR. In addition to the locations of all anomalies, the maps will also show other pertinent features such as: channel beacons and buoys, channel alignments, bridges, cables and pipeline crossings. The maps will be accompanied by tables listing all magnetic anomalies recorded during the survey. At a minimum, the tables will include the following information: Project Name; Survey Segment/Area; Magnetic Target Number; Gammas Intensity; Target Coordinates (Louisiana State Plane).

If determined necessary by the COR, the final report will not include detailed site location descriptions, state plane or UTM coordinates. The decision on whether to remove such data from the final report will be based upon the results of the survey. If removed from the final report, such data will be provided in a separate appendix. The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible. Additional requirements for the draft and final report are contained in Section 6 of this Scope of Services.

6. Reports

a. Management Summary. Two copies of a brief management summary which presents the results of the fieldwork will be submitted to the COR within 7 days of completion of the fieldwork (28 days after award). The report will include a brief description of each anomaly located during the survey and recommendations for further identification and evaluation procedures when appropriate. A preliminary map will be included showing the locations of each anomaly.

b. Draft and Final Reports. Five copies of a draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 58 days after the date of the award. Completed state site forms will be submitted under separate cover at the same time as the draft report. The final report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973.

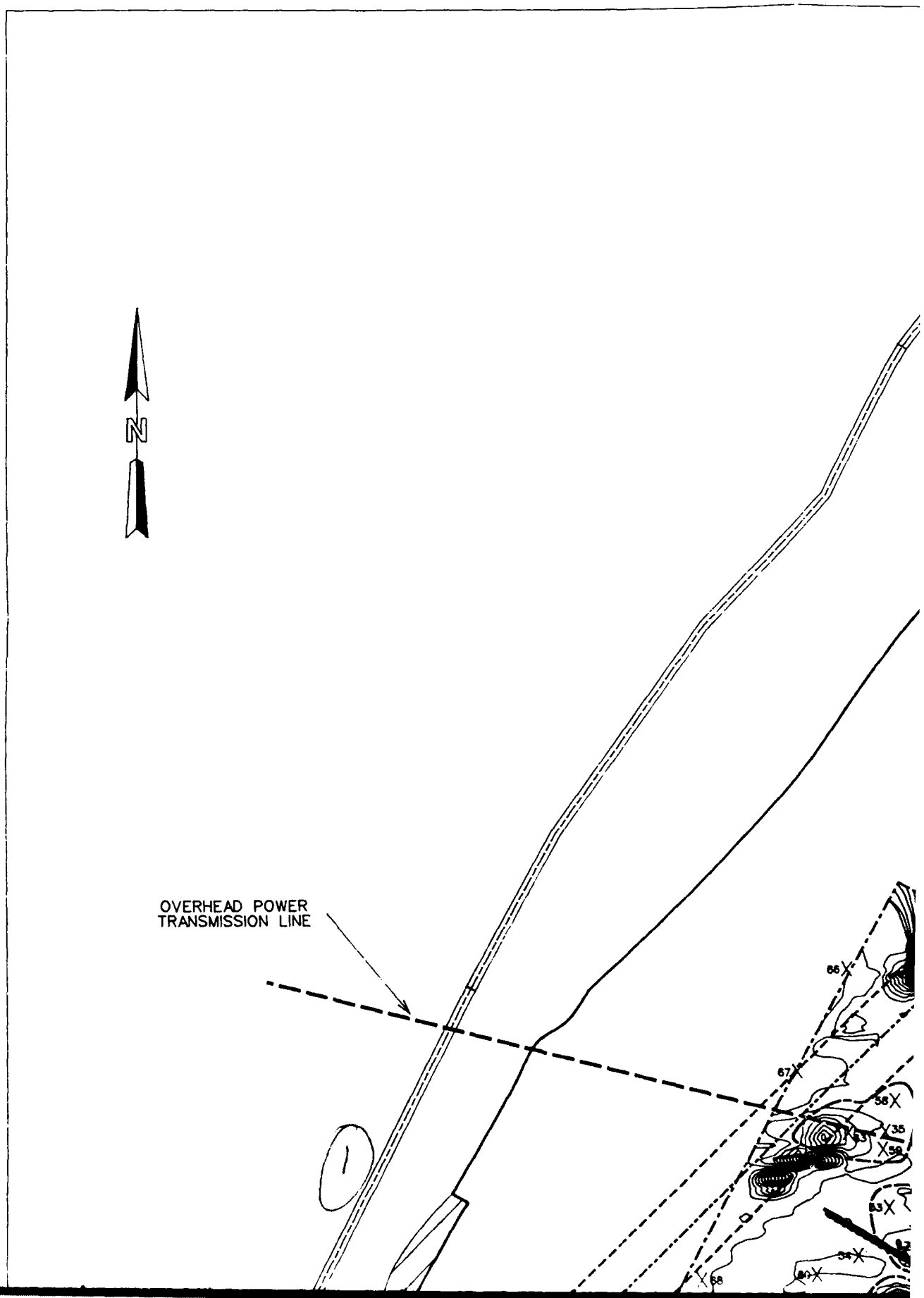
The COR will provide all review comments to the Contractor within 42 days after receipt of the draft reports (100 days after date of order). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 10 days (110 days after date of order). Upon approval of the preliminary final report by the COR, the Contractor will submit one reproducible master copy, one copy on floppy diskette, 30 copies of the final report, and all separate appendices to the COR within 113 days after date of order. A copy of the Scope of Services shall be bound as an appendix with the Final Report.

7. Weather Contingencies.

The potential for weather-related delays during the survey necessitates provision of one weather contingency day in the delivery order. If the Contractor experiences unusual weather conditions, he will be allowed additional time on the delivery schedule but no cost adjustment.

8. Attachments.

Attachment 1. Design Plans H-4-30946 showing the study area (2 copies)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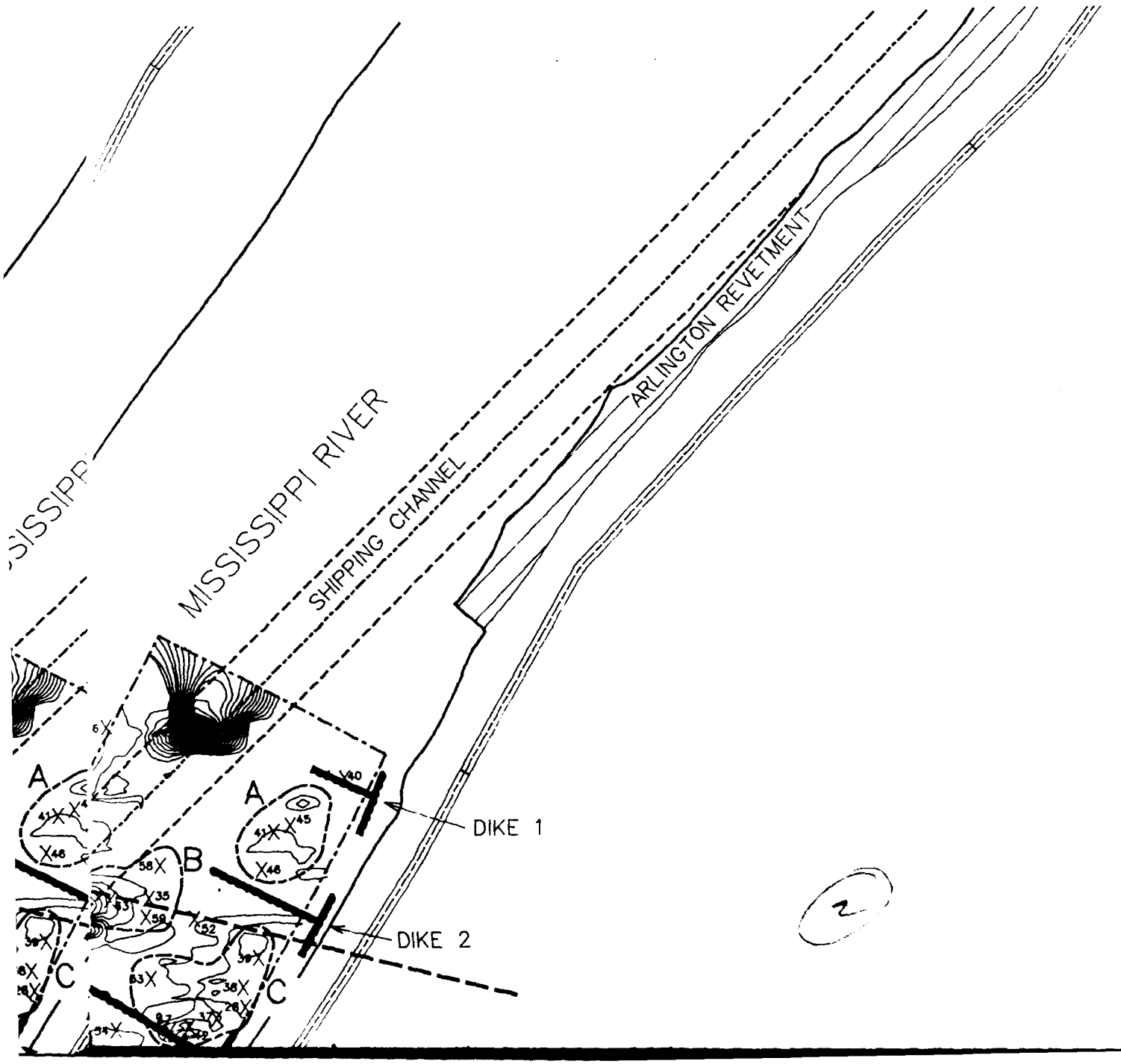
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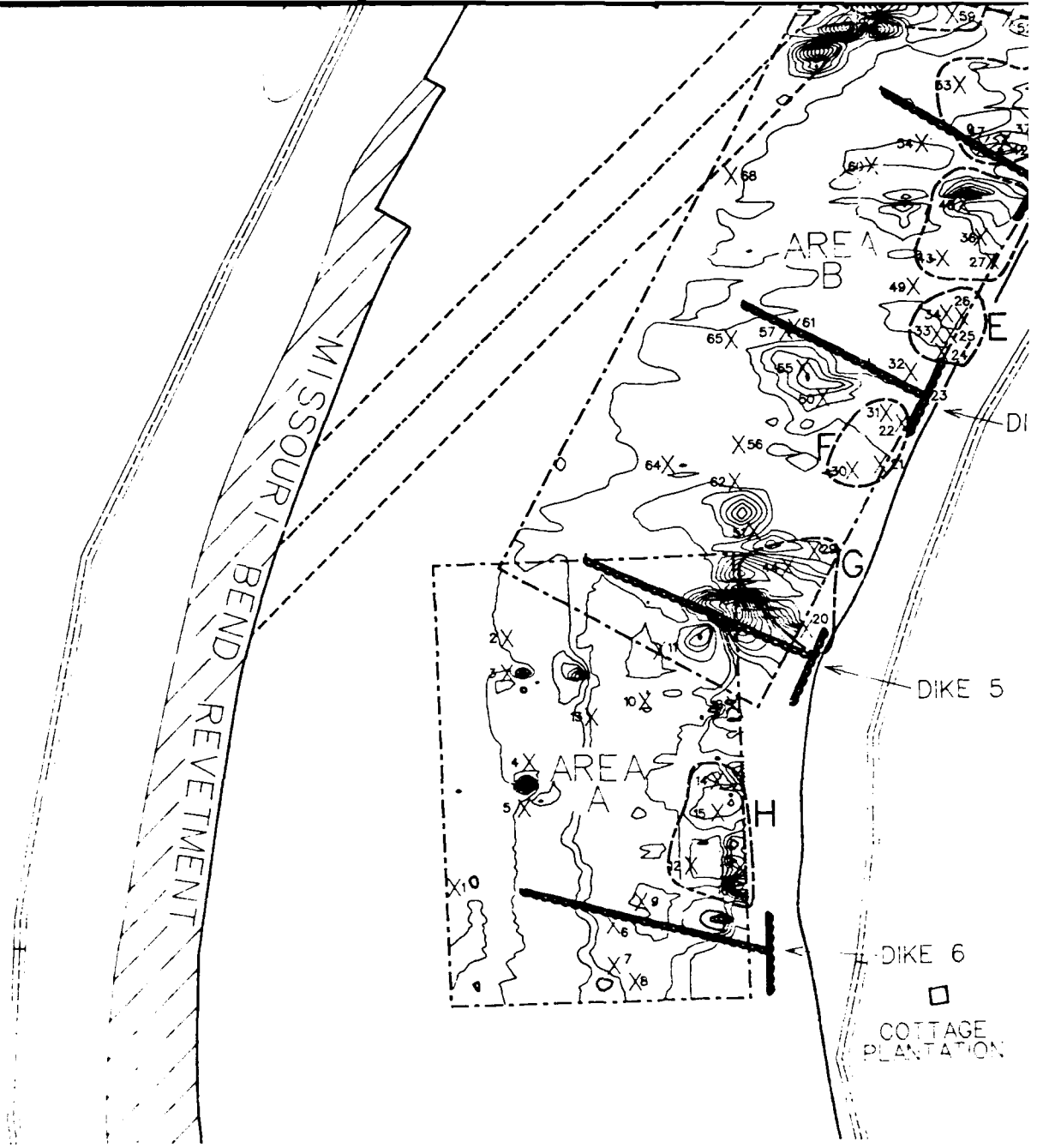
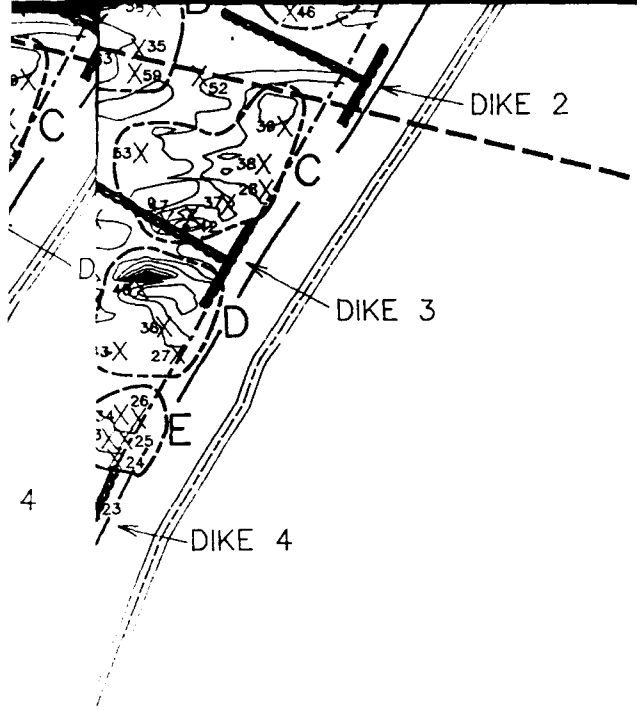


Figure 14 Magnetic contour map of the Red Eye Crossing Project Area.



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