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Flood Plain Management Assessment

June 1995

Appendix E
(Cultural Resources)



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The oversight agency for the floodplain management assessment was the North Central Division. The St. Paul District was the lead agency for completion of the report, but actual work on the report was accomplished by five Corps District; St. Paul, Rock Island, St. Louis, Kansas and Omaha.

The assessment evaluated the impacts of a wide array of floodplain policies, programs and flood damage reduction measures to the Midwest Flood of 1993. However, this assessment has taken an important step toward achieving a better understanding of the current uses of floodplain, forces causing those uses and impacts of various alternative changes in the management of floodplains. Some of the objectives included in the assessment are: describing land and water resources and making projections of future conditions; identify local interests; alternative uses of floodplain resources; identify facilities needing additional flood protection; examine Federal cost-sharing; evaluate cost effectiveness of alternative flood control projects and recommend improvements to current system.

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**FLOODPLAIN MANAGEMENT ASSESSMENT
OF THE
UPPER MISSISSIPPI AND LOWER MISSOURI RIVERS
AND THEIR TRIBUTARIES**

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This appendix is a compilation of working papers generated by the five Corps of Engineer Districts involved in the Floodplain Management Assessment. These working papers are often results of separate analyses that were synthesized to generate the main report. The data in these appendices were not as thoroughly reviewed to remove all inconsistencies or editorial errors as was accomplished for the main report. In some cases numbers may have been reconciled in the main report but not in the appendix.

FLOODPLAIN MANAGEMENT ASSESSMENT

ST. PAUL DISTRICT

CULTURAL RESOURCES AFFECTED ENVIRONMENT

Upper Mississippi River

Introduction

The Mississippi River and its valley have been many things to those who have inhabited it. The river has been a central transportation corridor; a resource for fish, game, mussels, and wildrice; a boundary between human groups; a recreational resource and its floodplain terraces home to people for more than 12,000 years. During their travels on the river, in their camp sites and village sites and their cities and in the wrecks of their boats, the valley's inhabitants have left evidence of their presence. Flood control policies and programs have the potential to damage or destroy this evidence.

This section of the environmental appendix provides the context for understanding the potential number and value of archeological and historic sites in the Mississippi and Minnesota River Valleys.

Archeology

In the broadest sense, the human occupation of the Upper Mississippi River Valley is a story of successful adaptation to environmental and social shifts over a 12,000 year period. The character of the valley has changed dramatically since the arrival of the first people some twelve thousand years ago. From glacial fronts and torrential floods that have swept the valley, to a several thousand year drought in which the Mississippi may have dwindled to little more than a stream, to the lush floodplain that we fish, hunt, and enjoy today, past cultures have occupied the banks of the river nearly continuously. Through these 12,000 years, the complexity of the cultures grew as population and technological innovations grew. Throughout it's past, the river provided a centralizing focus for subsistence, travel and the exchange of materials and ideas.

Robert Boszhardt and James Theler

Our knowledge of the prehistoric past along the Mississippi River comes from archeological excavations beginning in the 1800's and continuing to the present day. Early investigations focused on areas adjacent to the floodplain, such as terraces and upland bluff tops. However, over the past decade, investigations along the river have increasingly shifted to include more study of the floodplain environment in an attempt to understand when and how prehistoric peoples were using it.

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APP E - Cultural-1

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Much of the archeological survey that has been done on the floodplain of the Upper Mississippi River over the past decade has been associated with Federal programs and projects. For the most part, surveys associated with Federal projects have been small in scale and oriented towards the specific project area in question. While these type of survey efforts have provided information on the presence and absence of resources that effect Federal projects, these surveys have not provided a comprehensive approach to resources management.

A more comprehensive approach to the study of cultural resources should be undertaken - one that would focus on identifying appropriate methods and techniques for the study of floodplain environments, identifying specific geological patterns that influenced human settlement patterns, and identifying the full range of resources that may be present. This approach would allow for better management of the resources, and, in the long run, would expedite the Federal compliance process for cultural resources related to small projects.

The standard survey methods and techniques used for upland environments are not necessarily those best suited to the floodplain. Over the past several years, chance encounters during floodplain surveys have located deeply buried sites in a number of locations along the river. If we are to fully appreciate how prehistoric populations were using the river over time, we cannot leave the location of some sites to survey techniques that only provide chance encounters while other sites are consistently located. Furthermore, before embarking on floodplain survey, a better understanding of the morphology of floodplain environments is absolutely necessary. Unless this is accomplished prior to undertaking surveys on the floodplain, we can expect to continue surveying with inappropriate methods and in areas that may have little potential for furthering our understanding of the prehistory of the river.

Within that portion of the Upper Mississippi River that St. Paul District operates, recent investigations have shown that, while some areas of the river have not changed significantly for thousands of years, other areas have changed radically. Geomorphological studies of some of the pools along the Upper Mississippi River suggest that major changes have taken place in river morphology that affect the potential for finding sites, and, once found, the way in which these sites must be interpreted.

A comprehensive survey of Pool 4 suggests that siltation of Lake Pepin over the past 1,500 years has reduced the size of the lake by nearly 5 miles. This information should have a dramatic effect on the way archeologists look at this section of the river for planning and conducting future archeological surveys. This information also effects the archeological interpretations of sites previously found along the river in these areas. For example, archeological site 47PI95 was discovered in a 1988 survey of Pool 4 and was listed as being associated with a natural levee unit of the river. However, Dr. Clark Dobbs, in his final report of investigations, cautions

... we strongly suspect that further investigations at this site will reveal that it is actually within the remnant of a small delta or beach cusp that has been embedded in a more recent levee formation. The radiocarbon dates from near this site indicate that the Lake was at this point at least 800 years ago. At least some of the cultural materials recovered from the site are older than 800 years, suggesting that the site was used in association with activities oriented toward the lake, not the river.

Further downstream in Pool 7, a comprehensive survey failed to locate significant archeological resources associated with the floodplain of the Upper Mississippi River in this area. The results of this survey were surprising since the density of archeological sites on river terraces surrounding La Crosse is extremely high. This phenomenon is likely associated with the large amount of post-settlement alluvium that has been discharged into the Mississippi River by the Black River. Boszhardt, in his 1988 survey of Pool 7 states:

The survey results posed a critical question: Do the lack of identified sites on Holocene landforms in Pool 7 reflect non-utilization by prehistoric and early historic groups, or do such sites exist but are simply not possible to locate given traditional floodplain shoreline survey methods? Based on the extensive prehistoric utilization of the Mississippi floodplain...it seems improbable that similar activities were not conducted in the upper reaches of Pool 7. To the contrary, it is highly likely that numerous sites do exist there.

From excavations of archeological sites on the terraces adjacent to the river, it is apparent that the resources of the floodplain were being used much the same as other areas where floodplain sites are prevalent. Therefore, we must assume that archeological sites that once were near the surface of the floodplain are now buried under an undetermined amount alluvium.

Geomorphological studies have also shown that where we look for archeological sites has a direct bearing on the types and ages of the sites that we find. Comprehensive surveys of Pool 10 have identified an extremely large number of floodplain sites along the river banks; however, river morphology dictates the location of these sites. For example, sites have a much higher probability of being found along lateral accretion ridges than along mid-channel islands.

Many investigations of Pool 10 have focused on the location of sites through shoreline survey, and, interestingly, these shoreline surveys have identified a preponderance of late period sites. Clues of the existence of earlier floodplain sites have been found, but few actual early sites are known. Peter Church, in his study of the geomorphology of Pool 10 (The Wisconsin Archeologist, Volume 66, No. 3) suggests that

Islands underlain by lateral accretion deposits have a high potential of containing archaeological sites. Prehistoric cultural material will be found in or beneath the vertical accretion deposits that mantle the lateral accretion deposits. Buried sandy ridges under the island interiors are older than those along the island perimeters and some may represent middle to possibly late Holocene landforms. (p. 235)

In 1988, Richard Wahls, a graduate student at the University of Wisconsin-Madison, confirmed Church's thesis that the island interiors may prove to be good locations for earlier sites, when he discovered the Tillmont archeological site. He describes this site as a large, well stratified multicomponent site located on a ridge in the center of an island. The Tillmont site dates from the Archaic through the Early, Middle, and Late Woodland periods, and also includes Mississippian and historic components.

In 1982, the St. Paul District conducted a literature search and records review of archeological and historic sites along the Mississippi River. At that time, more than 1000 known sites and districts were identified along the river valley. These sites contained more than 1400 archeological components

from the earliest Paleo-Indian periods of 13,000 years ago to historic archeological sites associated with the early historic transportation of the mid 1800's.

The St. Paul District has also placed more emphasis in identifying historic archeological sites along the river such as the Winter's Landing site in Pool 7 and the structures associated with lumber booming along Beef Slough. The District is currently reviewing historic maps for data that will help identify these resources to insure that future studies along the river take them into consideration.

Most recently, the District has completed a literature search and records review of historic shipwrecks that are known to have sunk along the river. Until passage of the Abandoned Shipwreck Act of 1987, these shipwrecks represented a category of resources that had, for the most part, been overlooked by both the States and the Federal government. This inventory effort has identified over 60 wrecks along the Mississippi, St. Croix and Black Rivers. While much has been written about the riverboat era along the Upper Mississippi River, these resources have a great potential for providing specific information on the vessels themselves. At the present time, we know very little about construction methods and the history of construction development for the riverboats that plied the Upper Mississippi.

Since the early days of Federal involvement on the Upper Mississippi River, the approach to archeology along the river has become increasingly more sophisticated. More resource types are being considered than ever before, survey methods and techniques are changing to meet the demands of varying conditions on the river, and archeological investigations are more consistently taking a multi-disciplinary approach to survey and evaluation of located resources. While archeology of the Upper Mississippi River has come along way over the years, significant progress can still be made.

For a more detailed review of the archeological cultures and the geomorphological history of the Mississippi River, the St. Paul District is compiling a detailed database for Pools 7 through 10 of the Mississippi River. A draft report from the Great Lakes Archeological Research Center (GLARC) on past cultures and their geomorphological context has been completed. By May 1, the final report should be completed. In addition to compiling a database of all archeological sites in the Mississippi River Valley for Pools 7 through 10 GLARC is developing the historical contexts for the archeological and historical eras.

Historic Resources

Exploration and the Fur Trade

During the late seventeenth century, French explorers and fur traders became the first Europeans to enter the upper Mississippi River valley. They initiated an era of tremendous change. The Dakota, Sac, Fox and other tribes living along the river had known of and met the French before, and they had been trapping furs and had been receiving trade goods for decades. But direct contact would bring rapid change. French entry into the upper Midwest would lead to an ever increasing flow of Europeans and then Americans that would overwhelm the native populations. Written records from this era provide the great insights about Native Americans in this region and about what the region was like. But these records are scarce. Archeological sites dating from the era of exploration and

trade can add immeasurably to our knowledge of this era. Great care should be taken to identify and preserve these sites, many of which lie in the floodplain or have been submerged by the 9-foot channel project. The history of this era can be divided into three distinct, if not entirely separate, periods: the French, British and American.

The French (1673-1763)

As far as we know, Jacques Marquette and Louis Joliet became the first Europeans to see the upper Mississippi River. In 1673, they journeyed through Green Bay to the Fox River and then down Wisconsin River to the Mississippi. They were followed, during the early winter of 1680, by Father Louis Hennepin, Michael Accault and Antoine Auguelle who travelled down the Illinois to the Mississippi and then upstream to what is now St. Paul and then by land to Mille Lacs Lake. Later in their journey, they would meet Daniel Greysolon, sieur Du Luth, who had come down from Lake Superior via the St. Croix. These men had come in part to survey the region and claim it for France, but also to begin direct trade with the Native Americans there.

To solidify both aims, the French began building trading posts and small forts throughout the upper Mississippi River valley. They established three principal centers during the early 1700s: Lake Pepin, Prairie du Chien and Trempealeau. To trade with and attack the French, the Fox, Dakota and other tribes frequently visited these posts and forts. As many 150 to 200 independent traders may have been in the upper river basin by the mid 18th century.

Between 1756 and 1763, the French and British fought over issues in Europe and the New World. Called the French and Indian War or the Seven Years War, it ended with Britain victorious. France had to cede its lands east of the Mississippi, except New Orleans, greatly diminishing France's territory in the Americas. (They had ceded their lands west of the river to Spain the year before.)

The British (1763-1815)

Trade and exploration remained strong with the British. After 1763, Prairie du Chien became even more important, as one of the few centers from which the British operated. While the British tried to convince the region's Indians to come to their main post at Mackinac, they failed. Competition from French and Spanish traders coming up from the south soon led the British to open the trade to independent English and Colonial traders who flooded the region. The American Revolution had little affect on the fur trade. Few war related events occurred in the region and the British would not withdraw until after the War of 1812. During this era, the number of traders working in the upper river valley increased greatly, as did the number of sites from which they traded.

The Americans (1783-1837)

British traders who remained in the upper Mississippi River valley following the Revolutionary War concerned the Americans. British alliances with the region's Native Americans threatened the new country's hold on its western frontier. But, it was not until Zebulon Pike's expedition to the upper river 1805 and 1806 that the Americans began formal efforts to control the British. Pike's expedition,

as those of Stephen Long in 1817 and of Lewis Cass and Henry Schoolcraft in 1820, were undertaken to assess the status of the region's Indian tribes and natural resources.

To ensure the safety of those traders and other American citizens already on the frontier and to pave the way for more settlement, the Americans began building more substantial forts in the west. Built at the confluence of the Mississippi and Minnesota Rivers, Fort Snelling, begun in 1819, would become the most substantial of these.

By 1840, the nature of the fur trade was changing. In 1837 key lands along the Mississippi's east bank had opened for settlement. The settlers quickly decimated the surviving fur bearers. By this date settlers far outnumbered fur traders and would soon surpass the Native populations, and the wilderness of the upper Mississippi River valley quickly came under the ax and the plow.

Cultural Resources Potential

The era of exploration and trade represents a critical time in Native American and American history. During this era, Europeans established their foothold in the upper Mississippi River valley and Native American populations were forced to adapt to the great influx of Europeans and Americans, with their new cultures, new technologies and new diseases.

Fur traders did not come alone to the upper Mississippi River valley. As the trade expanded, more bookkeepers, servants, hunters and clerks joined them. Trading posts and regular rendezvous sites began growing into small villages. Many of these incipient villages were located in the floodplain.

Traders and explorers and those that followed them left forts, trading posts and associated buildings, portage routes, battle sites, rendezvous sites, historic Indian villages, camps and burial grounds, warehouses, agency buildings, early settlements.

Settlement and Transportation

Until the 1860s, no transportation route provided better access to the Midwest than the Upper Mississippi River. Explorers and fur traders relied on it from the late seventeenth century to the mid-nineteenth century. Between 1840 and 1880, steamboat traffic grew at the same frantic pace as did the population and production of the Upper Midwest. Immigrants, farmers and lumbermen depended on the river to transport themselves and their products, and commerce on the upper river flourished. By the late nineteenth century, traffic on the river began declining and, except for local shipping, almost disappeared by 1920. Since the Corps of Engineers completed the nine-foot channel project, commerce has returned to the upper river on a far greater scale than ever before.

Settlement. As the fur trade attracted the earliest settlers to the upper Mississippi River valley, the region's other resources--its land, minerals, and lured even more. The table below demonstrates how quickly the region's population grew during the nineteenth century.

Responding to the great inflow of immigrants, the Midwest's population soared between 1850 and 1900. Iowa's population grew from 192,000 to 2.2 million, Minnesota's population increased from

6,077 to 1.8 million, and Wisconsin's population swelled from 305,391 to 2.1 million. Overall, the Midwest's population grew from 5.4 million in 1850 to 26.3 million in 1900.¹ Many of these inhabitants lived along the upper river, especially in Minnesota and Iowa.

Early River Boats. Prior to 1840, those travelling in the Upper Mississippi River Valley relied on several different types of boats. Explorers and early traders used birch bark and dugout canoes. As the fur trade grew and the need to deliver larger quantities of goods to the region increased boats increased in size and capacity. From the canoe, traders moved to the pirogue, a large dug out canoe, or to the bateau, which was wider than the pirogue and tapered at the ends.

Later, shippers developed the keelboat. Entrepreneurs on the upper Mississippi River began using keelboats in the early 1800s. Built on a keel, with ribs and planking, some keel boats measured 40 to 80 feet long and seven to ten feet wide. The principal craft for hauling large loads upstream, keelboats had drafts of only 20 to 30 inches when loaded. Keelboats carried passengers, trade goods for the fur traders and military supplies for posts like Fort Snelling. Cargoes might include furs, grain, powder, alcohol, fabrics, metal goods, and numerous other commodities.²

Settlers and fur traders also used flatboats. Simpler in design and cheaper to build than keelboats, shippers employed flatboats primarily for moving passengers and goods downstream (for this reason they were far more important on the Ohio River than on the Upper Mississippi). Ranging from 20 to 150 feet long and 12 to 20 feet wide, these boats carried 30 to 40 tons of goods. By the mid-1840s, steamboats had driven keelboats and flatboats from the upper river.³

Cultural Resources Potential. As the great majority of the Upper Mississippi River valley's population and economic growth occurred after the 1840s, we would not expect to find many wrecks of the boats of early settlers, explorers and traders. Nor is there much evidence regarding the location and dates of the demise of such boats. As they had shallow drafts, they could have used the main or side channels in the river. Since few of these vessels may exist, those that are found would be of great historical value.

The Steamboat Era. Paddling upstream from St. Louis to St. Paul in 1823, the *Virginia* became the first steamboat to navigate the Upper Mississippi River. Steamboat traffic grew slowly over the next two decades. In 1841, forty-four steamboat arrivals were recorded in St. Paul, and in 1849, 95 steamboats landings were counted there. During the 1850s, however, traffic boomed. In 1857 and 1858, St. Paul became a bustling port, with over 1,000 steamboats arrivals each year. One-hundred and thirteen river miles downstream, Winona, Minnesota, was even busier, counting 1,700 steamboat dockings in 1857. The railroads that had reached the east bank of the upper river before the Civil War fed goods and passengers to the steamboat trade, further invigorating it.⁴

Passenger traffic on the upper Mississippi River began with the *Virginia's* arrival in 1823 and grew slowly until the 1840s. With Iowa's statehood in 1846 and Wisconsin's in 1848 and the creation of the Minnesota territory in 1849, immigrants began streaming into the Upper Midwest. And while some immigrants reached the Midwest by way of the Great Lakes, many settlers entering Wisconsin, Iowa and Minnesota made part of their journey on the upper river.⁵ By the 1850s, passenger traffic became so important to the steamboat trade that passenger receipts often exceeded freight receipts.⁶

Railroads, reaching the east bank of the Mississippi River in the mid to late 1850s, promoted passenger traffic. In 1854 the Chicago and Rock Island Railroad became the first railroad to reach the Mississippi River, when it entered Rock Island, Illinois, and that same year, the Chicago and Alton connected with the upper river at Alton, Illinois. In 1855 another railroad entered Alton and one reached Galena, Illinois. Quincy and Cairo, Illinois, became railheads in 1856, and East St. Louis, Illinois, and Prairie du Chien, Wisconsin, in 1857. La Crosse, Wisconsin, joined these cities, becoming the terminus of the Milwaukee and La Crosse in 1858. In 1856 the Chicago and Rock Island became the first railroad to cross the Mississippi.⁷

Agricultural production boomed with the Midwest's population. In 1850 Iowa, Minnesota and Nebraska produced 11.8 million bushels of wheat, corn, oats and soybeans. In 1860 these crops totaled 65.8 million bushels, and by 1870 they accounted for 162 million bushels.⁸ By 1860 agricultural production had overwhelmed steamboat capacity. In the spring of 1860, the *Stillwater Messenger* estimated that farmers between St. Paul and La Crosse had stockpiled 200,000 bushels of grain for shipment on the river, and that by the beginning of the navigation season, they would have added another 150,000 bushels.⁹ In response to this demand, steamboats began pushing barges during the 1860s and 1870s. One barge could carry as much as ten-thousand bushels of grain and some steamboats pushed five barges. The St. Paul trade employed over 186 barges by 1866. While some barges moved grain to railheads for transshipment, others carried their cargoes to St. Louis and occasionally to New Orleans.¹⁰ By the late sixties, grain shipping, primarily wheat, ranked second to timber in downstream movement.

Steamboats began losing passengers and grain to railroads during and after the Civil War. Although early railheads on the upper river's east bank had fostered steamboat traffic, they had initiated its end as well. With each new rail connection, steamboats made shorter trips between ports. Instead of going to St. Louis or New Orleans, boats unloaded at La Crosse, Prairie du Chien, Rock Island or at other railheads, making most river commerce local.¹¹ As railroads pushed lines across the Mississippi River, grain did not have to move to a river port before transshipment to a railhead. Between 1865 and 1869 three railroads crossed the river to Iowa: the North Western Railroad completed a bridge to Clinton in 1865, the Burlington Railroad finished one to Burlington in 1868, and the following year, the Illinois Central Railroad reached Dubuque. By 1880 thirteen railroads bridges spanned the Upper Mississippi River, and most of the trans-Mississippi states north of St. Louis shipped their products to the east by rail.¹² As railroads built lines paralleling some reaches of the river, steamboat traffic along those reaches quickly disappeared. By 1918 no packet boats or barges carried freight between St. Paul and St. Louis.

Cultural Resources Potential. Because cities along the river were so tied to it, they located their wharves, docks and many of their buildings on the waterfront and in the floodplain. Early photographs and maps clearly show this.

Given the number of steamboats that plied the Upper Mississippi River and the numerous hazards of steamboats navigation, the chances of finding steamboat wrecks are much higher than finding wrecks of earlier vessels. We have much more information about the location, date and cargoes carried on ships that sank in the upper river. Many of these wrecks may have survived dredging on the upper river because they are deeply buried or are in a side channel. We need to examine the historic record of steamboat wrecks carefully and compare the it to proposed and existing dredge cut sites. A recent study of shipwrecks indicates that 62 wrecks occurred in St. Paul District's portion of the river. (See John O. Jensen, "Gently Down the Stream: An Inquiry into the History of

Transportation on the Northern Mississippi River and the Potential for Submerged Resources," Wisconsin Archeologist 73:1-2 (March-June, 1992):61-110.)

Although no work has been done in this area, railroad related cultural resources--the abutments of the earliest bridges, for example--should exist in the river valley.

Timber

Timber products dominated the upper river's commerce from the 1870s to the first decade of the twentieth century. They comprised the greatest quantity of merchandise shipped on the river, and lumbermen shipped them farther and they accounted for more of the total value of goods moved on the river than other commodities. More than passenger traffic or grain hauling, timber shipping prompted federal spending on river improvements for over forty years. Lumbering had begun in Wisconsin and Minnesota in the 1830s and grew rapidly during the 1840s and 1850s.¹³

Raftboats guided log and lumber rafts that came from the Mississippi's Wisconsin tributaries and from above St. Anthony Falls to sawmills and retailing centers along the upper river from Minneapolis to St. Louis. These mills turned the logs and rough lumber into finished lumber, lath, and shingles that they shipped farther downriver or sent by rail to points east and west.¹⁴ Newly arrived immigrants and the rapidly growing domestic population used this lumber to build houses, farm buildings and business establishments throughout the Midwest. As railroads completed lines west of the Mississippi River, settlements spread deeper into the timberless plains and the demand for lumber grew.¹⁵

Boom companies formed to sort and assemble logs floated into the Mississippi River from its tributaries. Mississippi River Commission maps from the late nineteenth century show booms located along many reaches of the upper river. The sorting and rafting works in the Beef Slough area at the mouth of the Chippewa River became one of the largest booming works in the world during the last part of the nineteenth century.

Timber shipping on the Upper Mississippi River lasted as long as the white pine forests of western Wisconsin and northern Minnesota. Initially, the St. Croix, Black and Chippewa Rivers of Wisconsin fed the largest quantities of logs and lumber into the Upper Mississippi. While the Wisconsin River basin was estimated to hold 130 billion feet of pine in 1840, the largest reserve of timber rested in the Black and Chippewa River basins. One-sixth of the nation's white pine west of the Appalachians stood in the Chippewa valley alone.¹⁶ By 1892, however, the quantity of lumber expelled from Wisconsin's tributaries began declining. From 718 million feet of lumber milled along these tributaries in 1892, the amount produced fell to 465 million feet in 1900 and to 123 million feet in 1909. Masking this decline, mills in the Twin Cities and above began contributing more logs and lumber to the Upper Mississippi River. In 1888 these mills dispatched twenty-seven rafts downstream.¹⁷ By 1897 sawmills in Minneapolis and above produced more than those on the Mississippi's Wisconsin tributaries.¹⁸

Overall, 1.6 to 2.1 billion feet of lumber moved into and on the Upper Mississippi River each year between 1892 and 1900. After turning out 2.0 billion feet in 1901, lumber milling along the river steadily declined. By 1909 mills on the river generated only 418 million feet of lumber.¹⁹

Sawmills and raftboats fell with the forests of Minnesota and Wisconsin. At its peak, during the years 1893 and 1894, the lumber industry employed about 100 raft boats and 100 sawmills on the Mississippi River between Minneapolis and St. Louis.²⁰ The number of sawmills dropped to 80 by 1900, 36 by 1903, and 1 by 1913. Raftboats followed a similar decline. Of more than 100 raftboats plying the upper river in 1893, 86 remained on the river in 1900, 50 in 1904, 20 in 1906, and only four in 1912.²¹ In 1915 the *Ottumwa Belle* guided the last lumber raft down the Mississippi from Hudson, Wisconsin, to Fort Madison, Iowa.²²

Cultural Resources Potential. Given the intensity of lumber shipping on the upper Mississippi River, the potential for sites associated with the industry is considerable. Raft booming sites, including on land and in stream structures, logging camps, and floodplain sawmill sites may all be found in the river or its valley.

River Improvement

The Upper Mississippi River's landscape has changed dramatically since European explorers and traders first sailed on its waters. Most of the changes have come as a result of efforts to improve the river for navigation, but sedimentation, due to agriculture and clear cutting have contributed. Where cultural resources might lie or what condition they might be in may be determined by these factors.

Channel Constriction (1878-1930). Before the 1850s, the Corps of Engineers did little to eliminate natural obstacles to river transportation.²³ Following the Civil War, however, the Corps began improving the Mississippi River for navigation through dredging, snagging and clearing, and channel constriction. The Engineers constricted the river with wing dams and the closing of side channels. Wing dams were long, narrow piers, composed of alternating layers of rock and bush, that extended into the river. Together with closing dams, they forced the river down a narrower passage, allowing it to cut through sand and debris in the main channel. The river then trapped the sediment behind or between the dams. The Engineers built experimental wing dams on the Upper Mississippi River in 1874 at Pig's Eye (later South St. Paul) and in 1875 and 1876 at Nininger Slough, about one mile above Hastings, Minnesota. Based upon the success of these dams and pressure from waterway advocates, Congress authorized the four and one-half foot channel project on June 18, 1878, for the Mississippi River between St. Paul and the mouth of the Ohio River.

By the end of the nineteenth century, however, river boosters argued that if the Mississippi River was to offer a reliable navigation route or effective competition against railroads, it needed a deeper channel. With the timber industry faltering and other commodities not seeking waterway transportation, many river boosters blamed the decline of river traffic on the inadequacy of the four and one-half foot channel.²⁴ Responding to the Midwest's demand for help and to a railroad car shortage in 1906, Congress authorized the six-foot channel project on March 2, 1907. This project called for more channel constriction and dredging and the construction of locks and dams at the Des Moines and Rock Island rapids.²⁵

Through channel constriction, the Corps changed the character of the Upper Mississippi River. The engineers made former side channels into the main channel, removed islands, isolated backwaters with closing dams, sloped and riprapped banks and began narrowing the river. By 1930 the Corps had built over 1,000 wing dams between the Twin Cities and Trempealeau, Wisconsin. In a ten mile reach

of the river above Winona, Minnesota, the St. Paul District had constructed almost 140 dams by 1930. The areas between the dams filled with sediment, and trees and plants soon began growing from the dams and from the newly-formed land between them. By 1930, the river's banks had moved significantly inward.

Cultural Resources Potential. Channel constriction changed how the river was used and it changed here cultural resources lay. Some historic sites--such as shipwrecks--may have been buried in sediment. Wing dams collected massive amounts of sediment along the river's banks and the Engineers deliberately filled some backwaters and others filled in naturally due to closing dams. Other sites, those along the river's banks, may have been eroded away as wing dams directed the current toward them or they may have been buried by riprap when the Engineers protected the banks.

Locks and Dams. Despite these improvements, commerce on the upper river declined steadily throughout the early twentieth century. During this same period, the region's population and production increased dramatically. As the Midwest's need for a multi-faceted transportation system grew, its shipping options declined. By the mid-1920s, the region faced a transportation crisis. The crisis had been building for forty years. Its origins lay in the Upper Mississippi River's failure to be a viable or competitive transportation route and in railroad expansion. Other factors contributed to the crisis as well. Railroad car shortages, the Panama Canal's opening and an Interstate Commerce Commission decision erected what Midwesterners called an "economic barrier" around their region.

In response to the transportation crisis, Midwesterners initiated a movement to restore commerce on the Upper Mississippi River. Led by the Minneapolis Real Estate Board, the movement began in the Minneapolis, in 1925, and spread quickly to cities downriver. Between 1925 and 1928, river boosters, including many of the Midwest's largest and most important businesses and agricultural organizations, struggled to restore commerce on the upper river.

They soon realized that they needed a channel deep enough to support modern tows and barges, a channel deep enough to enable the economies of scale necessary to compete with railroads. Such a channel would require harnessing one of America's greatest rivers with locks and dams. In 1928, river boosters turned their attention to achieving this goal. For two years they fought to have the Corps of Engineers assess the project's feasibility and to get Congress to approve it. Despite President Hoover's opposition and Corps misgivings, deep channel supporters convinced Congress to include their project in the 1930 Rivers and Harbors bill.

During the next ten years, the Corps of Engineers constructed 23 locks and dams from just above Red Wing, Minnesota, to near St. Louis, Missouri. These locks and dams have fundamentally changed the character of the upper river. The dams have submerged many of the wing dams and closing dams, and they have inundated land that Indians, explorers, traders, settlers, and others formerly used for a variety of activities. To understand the potential for cultural resources in the river and its valley, we have to consider these changes.

St. Paul District built three other locks and dams on the upper river before the it began the 9-foot channel project. The first, the Meeker Island Lock and Dam was completed in 1907, but due to the development of hydroelectric power in the early twentieth century, it was destroyed in 1912 to make way for a high dam. This high dam would be call Lock and Dam No. 1 or the Ford Dam. The Engineers completed this dam in 1917. The Corps built Lock and Dam No. 1 to bring traffic into Minneapolis. To get traffic above St. Anthony Falls, the Corps would complete Lower St. Anthony

Falls Lock in 1956 and Upper St. Anthony Falls Lock in 1963. Because the river's slope above Hastings was so shallow, wing dams did not work well. Consequently the Corps completed Lock and Dam No. 2 at Hastings in 1930. All these projects had been pushed for by Twin Cities navigation boosters.

Cultural Resources Potential. The reservoirs created by the river's dams have flooded many areas that had been seasonally dry, places that may have held cultural resources associated with one of the eras discussed above. They have also submerged most of the wing dams and closing dams and have changed the river's hydraulic regime. Sites that may have been seasonally inundated are now permanently under water. Other sites may be eroding due to wave action in the reservoir. Channel maintenance activities should consider the new relationship between the river and potential cultural resources sites.

Dam No. 1 and Locks and Dams 3 through 26 have been determined eligible for the National Register of Historic Places. Remains of the Meeker Island Lock and Dam are still visible in the river and should be considered eligible for the National Register. Upper and Lower St. Anthony Falls Locks and Dam lie in the St. Anthony Falls Historic District, one of the most important historic areas in the State.

Conservation and Historic Resources

National and regional "conservationists" began trying to improve the upper Mississippi River for recreation and commerce soon after the Corps began its work. In 1871 Congress created the Office of the U.S. Commissioner of Fish and Fisheries.²⁶ While not in danger, the commission and the commercial and sport anglers that it served wanted the upper Mississippi to yield more popular food and game species. So, beginning in 1872--six years before Congress authorized the 4½-foot channel project--the commission introduced American shad into the upper Mississippi River and two years later began stocking it with Atlantic salmon. While neither the shad nor the salmon survived long, the commission successfully introduced carp and stocked the river with native fish it thought desirable. It also established itself as another federal agency with an interest in the river's management.

Fish management on the upper Mississippi expanded in 1874, when Iowa, Minnesota, Missouri, and Wisconsin established fish commissions. Iowa's commission, under its first commissioner, B.F. Shaw, began the most far reaching program. At first Shaw raised fingerlings for stocking use, but he soon turned to another source. Each spring, when the Mississippi flooded, fish entered the river's many backwaters to spawn. As the water receded, the adult fish returned to the river. Fingerlings--numbering in the hundreds of millions--remained and became stranded. Looking for a cheap source for stocking fish, Shaw recognized the trapped fingerlings as a tremendous resource. During the early 1870s, he began rescuing fingerlings from the backwaters and returning them to the river, and to the state's lakes and streams.

Other States and the Bureau of Fisheries soon followed Iowa's lead. But it was the Bureau that quickly dominated fish rescue on the upper river, establishing 34 fish rescue stations between 1917 and 1923. Fish rescue had become so vital to the Bureau's program by the early 1920s that its chief fish expert declared his agency dependent upon the Mississippi for its fingerling supply. In 1923, he reported, the Bureau provided 32 States with fish from the river. During the 1920s, the Bureau rescued 100 to 176 million fish annually.

Cultural Resources Potential. The nine-foot channel project, by flooding areas from which fingerlings had been rescued, forced the Bureau of Fisheries to change its fish management strategy. Instead of recovering stranded fingerlings, the Bureau had to build fish hatcheries and rearing ponds. Some of these it placed in the river valley. The remnants of ponds and other structures can still be found, and in some cases these features are historically significant (eg., the Guttenberg Fish Ponds near Lock and Dam No. 10). Other physical structures or sites associated with other historic aspects of fish and wildlife management in the Mississippi River valley undoubtedly exist.

Button and Clamming Industries

In the 1890s, as the lumber industry waned, the clamming and button making industry began on the Upper Mississippi River. J. F. Boepple, a German immigrant, founded the first button factory in 1891 in Muscatine, Iowa. By 1902, clambers had depleted the mussel beds in the Muscatine area. Clamming operations extended southward into Missouri and northward into Minnesota and Wisconsin. Productive mussel beds on the Upper Mississippi included those at Guttenberg, McGregor, Lansing, Prairie du Chien, Lynxville, Prescott, and as far north as St. Paul.²⁷

As interest in clamming and the button industry spread, hundreds of clambers came to the river in scows during the catch season, harvesting several species of clams. Clam fishermen raised tent cities along the banks of the Mississippi during the summer months, particularly around Lansing, McGregor, Harper's Ferry, and Prairie du Chien. Although clambers employed several methods of gathering clams, they most often used crowfoot bars pulled by a small, flat-bottomed "john boat." During the winter months, when the ice on the river became thick enough, clambers harvested mussels through the ice with "shoulder" and "scissor" rakes.²⁸

Once clambers had raked the clams from the river bottom, they brought them to shore. They then boiled the harvest in crude, oblong tanks to separate the shell from the clam meat. They often sold the meat as bait or as feed for poultry and hogs. Clammers sold the shells to local factories or shipped the shells downriver for processing. In factories, workers cut the shells into button "blanks" and then drilled and polished them. Hundreds of women and men worked for button companies grading, cutting, and boxing shell buttons. Markets for the Mississippi shell buttons extended across the country.²⁹

Entrepreneurs built button factories and "saw works" in several river towns in the late 1890s and early 1900s. Prairie du Chien had the large Chalmers Button Factory, as well as several smaller operations. Lansing and Guttenberg had three button factories each. Downriver, Muscatine, Davenport, and Clinton also had factories.³⁰

Commercial clamming, button cutting, and the trading of pearls--sometimes found in the clams--were significant parts of the economy of the Upper Mississippi for thirty years. During the 1930s and 1940s, however, inexpensive plastic buttons and the dwindling supply of mussels in the river destroyed the button industry.

Clamming revived on the Upper Mississippi in the late nineteen-sixties. Japanese cultured pearl growers demanded freshwater clams as seed for their pearls. The Japanese processes the freshwater mussel shells into round pellets, which they inserted into saltwater oysters for producing

pearls. Unlike previous clamming practices, clambers only took the larger shells of a few species, shipping thousands of tons of shells from Prairie du Chien to Japan.³¹

Several historic clamming sites, shell heaps, and buildings related to the button industry are located along the Upper Mississippi, particularly in the Prairie du Chien, McGregor, Guttenberg, and Lansing areas. The Red House landing site, located on the west side of the river near Marquette, is an important clamming station site that is being adversely affected by wave action and seasonal fluctuations in pool levels.³²

Minnesota River

Archeological and Historical Resources

Limited time and funds have precluded a detailed review of the cultural resources of the Minnesota River valley. However, in June 1993, the Minnesota Department of Natural Resources completed a study entitled "A Lower Minnesota River Valley Cultural Resource Study and Interpretive Plan for the Minnesota Valley State Park & Trail." This study provides a detailed overview of cultural resources in the lower Minnesota River valley.

ENDNOTES

1. Donald B. Dodd and Wynelle S. Dodd, *Historical Statistics of the United States, 1790-1970, Vol. II - The Midwest* (University of Alabama Press,); Hartsough, *Canoe*, 73-76, 106-108; Raymond Merritt, "The Development of the Lock and Dam System on the Upper Mississippi River," *National Waterways Roundtable Papers, Proceedings: History, Regional Development, Technology, A Look Ahead*, (Washington: U.S. Government Printing Office, 1980?), 91-93.
2. Hartsough pp. 29-32; Erik F. Haites, James Mak, and Gary M. Walton, *Western River Transportation: The Era of Early Internal Development, 1810-1860*, (Baltimore: The Johns Hopkins University Press, 1975), pp. 15-16.
3. Hartsough pp. 32, 67; Haites, *Western River Transportation*, pp. 14-15.
4. Hartsough, *From Canoe to Steel Barge*, (Minneapolis: University of Minnesota Press, 1934), pp. 57, 100-103; Frank Haigh Dixon, *A Traffic History of the Mississippi River System* (Washington: Government Printing Office: 1909):20.
5. Some easterners came to take the "fashionable tour." Arriving in St. Louis or at other railheads on the river's east bank, these excursionists traveled upstream, sometimes to St. Anthony Falls. Roald Tweet, *History of Transportation on the Upper Mississippi & Illinois Rivers*, (Washington: U.S. Government Printing Office, 1983), 21-22; Peterson, "Captain and Cargoes," 228, 234-38; Hartsough, *Canoe*, 74-75.
6. Peterson, "Captains," p. 235.
7. Dixon, *Traffic History*, pp. 29-30.
8. Dodd and Dodd, *Historical Statistics*.
9. Hartsough, *Canoe*, p. 103; she cites the *Stillwater Messenger*, March 27, 1860.
10. *Ibid.*, 116-117; she notes that barge shipping--as opposed to steamboat shipping--grew rapidly in the 1860s and 1870s.
11. Dixon, *A Traffic History*, p. 49; Hartsough, *Canoe*, pp. 84-85, 91.
12. Dixon, *Traffic History*, p. 48.
13. Hartsough, *Canoe*, 104, 119.
14. Robert F. Fries, *Empire in Pine: The Story of Lumbering in Wisconsin, 1830-1900*, (Madison: State Historical Society of Wisconsin, 1951), 78-83; Walter A. Blair, *A Raft Pilot's Log: A History of the Great Rafting Industry on the Upper Mississippi, 1840-1915*, (Cleveland: Arthur H. Clark Co., 1930), 255-64; *Annual Report 1877*, part 1, 531.
15. Tweet, *History of Transportation*, 31; Fries, *Empire*, 78-79.
16. Fries, *Empire*, 20; Merritt, "The Lock and Dam System," 91; Tweet, *History of Navigation*, 31.
17. *Annual Reports*, 1889, p. 1729; 1890, p. 2031.
18. *Annual Reports*, 1886 to 1897.

19. *Annual Reports*, 1892-1909.

20. One-hundred raftboats sailed the river in 1893 and 75 in 1894; 100 sawmills operated on the river in 1894; see *Annual Reports* for 1894 and 1895.

21. *Annual Reports*, 1892-1909.

22. Blair, *A Raft Pilot's Log*, 204; Tweet, *History of Transportation*, 32.

23. The Engineers undertook some surveys and removed some rock from the Rock Island and Des Moines Rapids, improved the St Louis and Dubuque harbors and carried out limited dredging and snagging.

24. Tweet, *History of Transportation*, 56, 76.

25. Patrick James Brunet, "The Corps of Engineers and Navigation Improvement on the Channel of the Upper Mississippi River to 1939," (Masters thesis, University of Texas, Austin, 1977), 79-82; "Mississippi River between Missouri River and St. Paul, Minn.," United States, 59th Congress, 2nd session, House Document No. 341, 1907.

26. Congress established this commission to address the country's decreasing food and game fish populations. Initially, Congress authorized the commission to study fishery problems, but, in 1872, it expanded the commission's duties to include raising and planting fish. See Frank T. Bell, "Proposals for a Solution of the Fishery Conservation Problem," *The Progressive Fish Culturalist*, Bureau of Fisheries, U.S. Department of Commerce (February 1936), 1.

27. Overstreet, p.134.

28. Overstreet, p.135.

29. Ibid.

30. Ibid.

31. Ibid., p.136.

32. Ibid.

FLOODPLAIN MANAGEMENT ASSESSMENT

ROCK ISLAND DISTRICT

CULTURAL RESOURCES AFFECTED ENVIRONMENT

Cultural Resources - Cultural resource base conditions derived from the 1993 flood impacts for the three reaches discussed below are judged to be -2 for both historic structures and archaeological sites. This is based on an arbitrary scale of -5 to +5.

Mississippi River Flood Plain: Muscatine, Iowa, to Saverton, Missouri (River Reach Code MI4) - This discussion is limited to the 156-mile reach of flood plain between Muscatine, Iowa (river mile 457), and Saverton, Missouri (river mile 301). Here the flood plain cuts across portions of 14 counties -- 6 in Illinois and 4 each in Iowa and Missouri.

500-Year Flood Plain Delineation

The 500-year flood plain, as mapped on Plate R-1, covers approximately 458,900 acres between Muscatine and Saverton. Boundaries are from the digital Flood Insurance Rate Map acquired by the Rock Island District from the Federal Emergency Management Agency in March 1994. The delineation is slightly flawed, as revealed by occasional discontinuities at political boundaries and elsewhere. Other flaws in flood plain delineation or in Iowa and Illinois cultural resource data were revealed by non-flood plain landform attributes on 7 of 235 sites in Illinois and on 25 of 209 sites in Iowa (Table R-2). Missouri site information contained no landform attributes.

Known Cultural Sites in the 500-Year Flood Plain

The number of recorded cultural resource sites (n = 551) in this reach of flood plain is broken down by state and county on Table R-2. This is the total count of cultural sites recorded within the 500-year flood plain as mapped on Plate R-1.

Iowa and Missouri site coverage was limited to certain USGS maps as noted on the table, thus omitting some portions of the extreme western part of the 500-year flood plain.

Portions of the 500-year flood plain not covered by this count included the 39,900 acres in Column B on Table R-5 -- roughly 9% of the total flood plain in this reach.

The count of 551 known cultural resource sites represents randomly recorded sites as well as sites recorded within documented Phase I survey boundaries. The documented surveys cover 37,900 acres (Table R-5, Column D) -- well under 10% of the total flood plain acreage. Whether or not this count included all National Register structures and districts listed on Table R-3 was not determined. Also undetermined are how many of the sites occurred inside or outside of the documented survey boundaries. Clearly, any use of these figures to derive site density estimates is inappropriate. See the section entitled Cultural Resource Site Densities, below, for more discussion of this point.

Table R-2

Flood Plain Management Assessment (FPMA) Project: Cultural Resource Sites along the Mississippi River between Muscatine, Iowa, and Saverton, Missouri – Count of Sites by State and County within the 500-Year Flood Plain				
County Name	Number of Cultural Sites by State and County			County Totals
	IL	IA*	MO*	
ADAMS	56			56
HANCOCK	15			15
HENRY	25			25
MERCER	47			47
PIKE	84			84
ROCK ISLAND	8			8
DES MOINES		95		95
LEE		26		26
LOUISA		72		72
MUSCATINE		16		16
CLARK			78	78
LEWIS			21	21
MARION			6	6
RALLS			2	2
State Totals	235	209	107	
Sites on Non-Flood Plain Landforms	7	25	?	
			Grand Total	551
Iowa site information current as of October 1991				
Illinois site information current as of November 1, 1993				
Missouri site information current as of mid-1991				
500-year flood plain from digital Flood Insurance Rate Map (acquired from the Federal Emergency Management Agency in March 1994).				
* Iowa and Missouri site coverage falls short of the entire 500-year flood plain because information is limited to USGS maps listed below.				
Iowa data limited to the following USGS 7.5-minute quadrangles: Muscatine, Blanchard Island, Toolesboro, Joy, Keithsburg, Kingston, Oquawka, Burlington, Fort Madison, Dallas City, Lomax, Nauvoo, Niota, Keokuk, and Hamilton.				
Missouri data limited to the following USGS 7.5-minute quadrangles: Croton, Argyle, Kahoka, Wayland, Keokuk, Kahoka SE, Warsaw, Canton, La Grange, Long Island, Quincy West, Quincy SW, Marblehead, Hannibal West, Hannibal East, and Hull.				

National Register Structures and Districts

Historic structures and/or districts (n = 32) listed on the National Register of Historic Places within the 500-year flood plain are identified individually on Table R-3. This information was acquired from the National Park Service and is current as of February 4, 1994.

Navigation Zone Cultural Site Count

An arbitrarily defined Navigation Zone was used in preparation of the Mississippi River Historic Properties Management Plan (HPMP). The Navigation Zone was defined as:

the areas within the Mississippi River main channel, island, and backwater corridor and extending landward one-quarter mile past the railroad grade or principal meander belt levee as shown on the United States Geological Survey 7.5-minute quadrangle maps, regardless of ownership. The navigation zone also includes publicly owned backwater sloughs in levied districts where water levels are controlled. The navigation zone does not include the crest of the bluff even if it lies within the one-quarter mile corridor (Benn, *et al.*, 1994a:37-38).

The Navigation Zone was delineated because the Corps recognized this restricted area as having the most potential for cultural resource site disturbance resulting from commercial and recreational use of the river. This zone also contained the majority of flood plain lands under direct Federal ownership, as well as lands generally most affected by Department of the Army permits issued under the Rivers and Harbors Act and the Clean Water Act.

A total of 196 cultural resource sites was documented within the 156-mile portion of the Navigation Zone between Muscatine and Saverton (Table R-4). Thirty-six of these sites have historic Euro-American components, but the presence of standing structures was not determined. Information on sites within the Navigation Zone was extracted from the draft report by Benn, *et al.* (1994a:Appendix B, HPMP/UMR-IWWS Database File, COE-HPMP.DBF, dated 8/1/94). What proportion of the Navigation Zone has been surveyed for cultural resources was not determined.

Table R-3

Flood Plain Management Assessment (FPMA) Project: Cultural Resource Sites along the Mississippi River between Muscatine, Iowa, and Saverton, Missouri -- National Register of Historic Places Listings within the 500-Year Flood Plain			
Site or District	City	County	State
1 Trinity Episcopal Church	Muscatine	Muscatine	IA
2 First Presbyterian Church	Muscatine	Muscatine	IA
3 McKibben, S. M., House	Muscatine	Muscatine	IA
4 Welch Apartments	Muscatine	Muscatine	IA
5 Bowman Livery Stable	Muscatine	Muscatine	IA
6 Clark, Alexander, House	Muscatine	Muscatine	IA
7 Warde, J. C. B., House	Muscatine	Muscatine	IA
8 Florence-Council On The Iowa Site	Oakville	Louisa	IA
9 Burlington, Cedar Rapids & Northern Freight House	Burlington	Des Moines	IA
10 West Jefferson Street Historic District	Burlington	Des Moines	IA
11 Atchison, Topeka and Santa Fe Passenger and Freight Complex Historic District	Fort Madison	Lee	IA
12 Saint Barnabas Episcopal Church	Montrose	Lee	IA
13 Geo. M. Verity	Keokuk	Lee	IA
1 Commerical House	Keithsburg	Mercer	IL
2 Keithsburg Historic District	Keithsburg	Mercer	IL
3 Nauvoo Historic District	Nauvoo	Hancock	IL
4 Felt, Cyrus, House	Hamilton	Hancock	IL
5 Warsaw Historic District	Warsaw	Hancock	IL
1 Twain, Mark, Boyhood Home	Hannibal	Marion	MO
2 North Main Street Historic District	Hannibal	Marion	MO
3 Mark Twain Historic District	Hannibal	Marion	MO
4 Broadway District	Hannibal	Marion	MO
5 Hafner Grocery Warehouse	Hannibal	Marion	MO
6 Davidson Building	Hannibal	Marion	MO
7 Holmes-Dakin Building	Hannibal	Marion	MO
8 Mark Twain Hotel	Hannibal	Marion	MO
9 Green Double House	Hannibal	Marion	MO
10 Elliott's, Robert, Wholesale Grocery	Hannibal	Marion	MO
11 Buildings at 207--209 South Main St.	Hannibal	Marion	MO
12 Digel Block	Hannibal	Marion	MO
13 Ebert-Dulany House	Hannibal	Marion	MO
14 Hannibal Lime Company Office	Hannibal	Marion	MO
National Register data from National Park Service, current as of February 4, 1994.			
500-year flood plain from digital Flood Insurance Rate Map (acquired from the Federal Emergency Management Agency in March 1994).			

Table R-4

Flood Plain Management Assessment (FPMA) Project:				
Cultural Resource Sites along the Mississippi River between				
Muscatine, Iowa, and Saverton, Missouri --				
Count of Navigation Zone Sites by State and County				
County Name	Number of Cultural Sites in the Navigation Zone by State and County			County Totals
	IL	IA	MO	
ADAMS	13			13
HANCOCK	11			11
HENRY	26			26
MERCER	9			9
PIKE	32			32
ROCK ISLAND	7			7
DES MOINES		14		14
LEE		23		23
LOUISA		46		46
MUSCATINE		1		1
CLARK			0	0
LEWIS			2	2
MARION			11	11
RALLS			1	1
State Totals	98	84	14	
		Grand Total		196
Information from draft file COE-HPMP.DBF dated 8/1/94 prepared by				
Bear Creek Archeology, Inc., Cresco, Iowa (DACW25-92-D-0008, W.O. No. 5)				
Site information current for Illinois as of November 1, 1993				
Site information current for Iowa as of September 30, 1993				
Site information current for Missouri as of March 1, 1994				

Phase I Cultural Resource Survey

Table R-5 shows Phase I cultural resource surface survey covering 37,900 acres, or 9%, of the 419,000 acres in the 500-year flood plain between Muscatine and Saverton for which cultural resource data were available. Column E shows the percentage of survey completed by state. Iowa with 17% coverage ranks far above Illinois (5%) and Missouri (9%).

Table R-5

**Flood Plain Management Assessment (FPMA) Project:
Mississippi River 500-Year Flood Plain between
Muscatine, Iowa, and Saverton, Missouri --
Phase I Cultural Resource Surface Survey Coverage***

State	500-Year Flood Plain (acres)				
	A	B	C**	D	E
	500-Yr. Flood Plain	Cultural Resource Data Unavailable	Cultural Resource Data Available	Acreage of C with Phase I Cultural Resource Surface Survey Completed	Percent of Phase I Surface Survey Completed, (D/C)x100
Illinois	223,400	0	223,400	11,700	5
Iowa	129,500	25,050	104,450	17,900	17
Missouri	106,000	14,850	91,150	8,300	9
Totals	458,900	39,900	419,000	37,900	9

* Information current as of 1991 or later.

** Iowa data are limited to the following USGS 7.5-minute quadrangles: Muscatine, Blanchard Island, Toolesboro, Joy, Keithsburg, Kingston, Oquawka, Burlington, Fort Madison, Dallas City, Lomax, Nauvoo, Niota, Keokuk, and Hamilton.

Missouri data are limited to the following USGS 7.5-minute quadrangles: Croton, Argyle, Kahoka, Wayland, Keokuk, Kahoka SE, Warsaw, Canton, La Grange, Long Island, Quincy West, Quincy SW, Marblehead, Hannibal West, Hannibal East, and Hull.

Phase I surveys represented in Table R-5 were conducted over several decades during which professional standards for field work and reporting did not remain static. Earlier surveys often took place under ground visibility conditions or with transect intervals no longer considered acceptable. Some early surveys with extensive acreage showing negative results must be considered suspect until verified by using current survey standards in selected sample areas or until satisfactorily explained by geomorphological or other variables.

Cultural Resource Site Densities

The site counts at Table R-2 and the surveyed acreage at Table R-5 cannot be used to calculate site densities because it is unknown how many sites were recorded within defined Phase I survey boundaries and how many were recorded randomly across the flood plain.

In addition, the limitations of many Phase I surveys, as noted above, restrict the usefulness of any resulting site density figures. This alone should prevent utilizing various raw densities for projecting total site numbers within the flood plain. Even more importantly, site densities within the flood plain vary enormously depending on landform. Without some minimal control for the quality of survey data and for basic geomorphological variables, reliable projection of total numbers of surface-exposed sites in the flood plain is not possible.

Geomorphological mapping is currently under way in Mississippi River Pools 11 through 22 within the Rock Island District of the U.S. Army Corps Engineers. This work, while documenting the potential for many landforms to contain archaeological remains, is also documenting limits to the archaeological record, limits imposed by alluvial processes reworking and removing vast areas of flood plain deposits down through the millennia of human occupation along the river.

The potential for reasonable estimates of site density on selected landforms will continue to increase (at least for surface-exposed sites) as more detailed information on the geomorphology of the valley becomes available and as more carefully controlled surveys are completed.

Knowledge of the extent of buried archaeological sites remains extremely limited. Virtually no sampling has been conducted to determine the extent of buried sites within the river's vast alluvial deposits. These deposits are known to contain buried sites of great age and at depths reaching to several meters below the present surface. Even many protohistoric and early historic sites are buried, lying under thick blankets of 19th and 20th century alluvium.

Archaeological sites remain poorly represented in the scientific record, while their destruction continues at a fast pace. These nonrenewable records of past human life along the river must surely have originally numbered well into the thousands just along this reach of river. Today, many classes of sites, burial mounds for instance, remain in only small fractions of their earlier numbers. Other types of sites have suffered similar fates, all resulting in a greatly diminished capacity for gaining an accurate picture of the past.

Des Moines River Flood Plain: Boone, Iowa, to Red Rock Dam (River Reach Code MIT11) - Much of this reach, except for areas within and immediately adjacent to the city of Des Moines, includes Corps of Engineers fee title and easement lands associated with lakes Saylorville and Red Rock.

Benn (1986:3) identified 521 cultural resource sites on the Corps Saylorville Lake fee title and easement lands, running from near Fraser, Iowa, through the Saylorville Downstream Corridor, and ending at Crocker Woods Park in Des Moines. Presently, 32 of these sites are considered eligible for listing on the National Register of Historic Places while 164 still require evaluation to establish National Register status (U.S. Army Corps of Engineers 1990, as revised). All others have been determined not eligible for the National Register. An Historic Properties Management Plan (HPMP) is in place for Saylorville Lake (U.S. Army Corps of Engineers 1993).

Information current as of October 1994 for Lake Red Rock listed 466 cultural resource sites on the Corps fee title and easement lands, running from just above Case Lake in southeast Des Moines to the Red Rock Dam. No sites were identified as eligible for inclusion in the National Register of Historic Places; 218 sites were listed as not eligible; 194 were listed as still in need of testing to establish National Register status; and 54 were listed with no indication of National Register status. An HPMP is in preparation for Lake Red Rock.

None of the sites at Saylorville Lake or Lake Red Rock include standing structures eligible for the National Register. However, National Register structures and/or districts have been tabulated for areas within the 500-year flood plain (Plate R-2) of the Des Moines River in Polk County. The five structures and/or districts identified on Table R-6 occur within 42,700 acres in the 500-year flood plain of the Des Moines River in Polk County; the flood plain is not defined in the areas above and below Polk County.

Table R-6

Flood Plain Management Assessment (FPMA) Project: Cultural Resource Sites along the Des River between Boone, Iowa, and Red Rock Dam -- National Register of Historic Places Listings within the 500-Year Flood Plain of the Des Moines River within Polk County, Iowa			
Site or District	City	County	State
1 Municipal Building	Des Moines	Polk	IA
2 Northwestern Hotel	Des Moines	Polk	IA
3 Fish and Game Pavilion and Aquarium	Des Moines	Polk	IA
4 Southeast Water Trough	Des Moines	Polk	IA
5 Civic Center Historic District	Des Moines	Polk	IA
National Register data from National Park Service, current as of February 4, 1994.			
500-year flood plain from digital Flood Insurance Rate Map (acquired from the Federal Emergency Management Agency in March 1994).			

Raccoon River Flood Plain: Dallas and Polk Counties, Iowa (River Reach Code MIT14) - Only one National Register listing (Table R-7) was found within the 500-year flood plain for this reach (Plate R-2). The listing is limited to the 6,900 acres of flood plain in Polk County because the flood plain is not defined in Dallas County.

Table R-7

Flood Plain Management Assessment (FPMA) Project: Cultural Resource Sites along the Des River between Boone, Iowa, and Red Rock Dam -- National Register of Historic Places Listings within the 500-Year Flood Plain of the Raccoon River within Polk County, Iowa			
Site or District	City	County	State
1 Valley Junction - West Des Moines City Hall and Engine House	West Des Moines	Polk	IA
National Register data from National Park Service, current as of February 4, 1994.			
500-year flood plain from digital Flood Insurance Rate Map (acquired from the Federal Emergency Management Agency in March 1994).			

Cultural Resource Site Management in Flood Plains - Regardless of the future course of flood plain management, destruction of the nonrenewable record of the nation's cultural heritage will continue. Only the types of impacts and the rates at which they will affect the resource will vary.

Private, commercial, and governmental actions all have potential to impact upon the fragile and nonrenewable record of the past. Currently, cultural resources are seldom taken into account for private, commercial, and local governmental activities unless Federal or State permitting or granting authorities are involved.

States provide some protection for cultural resources, although limited in many cases primarily to human remains.

Federal law provides the widest protection for cultural resources. This protection extends to all federally owned lands and to activities permitted, funded, or otherwise involving Federal undertakings.

The depletion of the archaeological record that began with the arrival of Euro-Americans in the Upper Mississippi Valley, and which continues into the present, is not likely to slow as increasing demands are placed on land resources from a growing population. With no prospect for the protection of most sites on private lands, Federal lands are becoming inadvertent archaeological reserves. As a result, the archaeological importance of Federal lands will increase through time.

Unique archaeological resources under Federal ownership in the Rock Island District include a significant number of as yet undiscovered sites buried within flood plains. Some indication of this potential is revealed by the presence of buried shell middens in Mississippi River Pool 16 (Barnhardt, *et al.*, 1992; Overstreet 1982, 1986) and by buried sites at Lake Odessa in Pools 17 and 18 (Benn, *et al.*, 1987, 1988). Other types of important sites in the Rock Island District range from an endangered prehistoric mound and village site (Benn, *et al.*, 1994b) through a buried protohistoric site (Boszhardt and Overstreet 1982; Overstreet 1983; Van Dyke and Birmingham 1984) to buried historic period sites such as Burriss City (Benn, *et al.*, 1988:336).

All Corps lands in the Rock Island District have Historic Properties Management Plans (HPMPs) completed or in preparation. These plans are important tools that will help determine the allocation of vital, but scarce, financial and human resources in the preservation and/or recovery of the fragile record of the past.

Open Space - The 1993 flood reduced the human use of land- and water-based activity during and after the event. Most recreation sites along the river were either completely inundated, or access points were closed due to high water. Once floodwaters receded, access was still limited due to cleanup of access roads, boat ramps, camping facilities, and day use areas.

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FLOODPLAIN MANAGEMENT ASSESSMENT

ST. LOUIS DISTRICT

CULTURAL RESOURCES AFFECTED ENVIRONMENT

DEFINITION OF FPMA STUDY AREA FOR ST. LOUIS DISTRICT

Within the geographic boundaries of the Corps of Engineers St. Louis District, the lower Illinois and three reaches of the Mississippi River are included in the Flood Plain Management Assessment study. On the Mississippi, the FPMA encompasses river miles 0 (at Cairo, Illinois) to 300 (near Hannibal, Missouri). The portion of the Illinois River included in the study is the section extending from its confluence with the Mississippi, upstream to the LaGrange Lock and Dam near mile 80.

CULTURAL RESOURCES BASE CONDITIONS WITHIN THE FPMA STUDY AREA

At the time of this writing, the total number of archaeological and historic sites known to exist in the St. Louis District FPMA study area is about 2,546. That is, along the 380 miles of river within the designated floodplain areas of the Mississippi and Illinois, there are at least 2,546 sites. Of these, 2,160 sites are "official" and are known to the state historic preservation agencies. Along the Illinois side of the Mississippi River, 1,472 sites are recorded in the GIS database maintained by the Illinois State Museum. The same database lists 388 sites within the lower 80 miles of Illinois River floodplain. In Missouri, records from the 1982 Great III Cultural Resource Inventory indicate that at least 300 sites were known to exist at that time along the Mississippi River. The two tables below report official site counts by county for the Mississippi and Illinois floodplains within the FPMA study area. In the tables, prehistoric and historic sites are considered together, and historic districts are considered as one site.

The official count of 2,160 prehistoric and historic sites in the FPMA study area can be reliably "adjusted" upward to about 2,546 using data from surveys and other sources. First, it is clear that the count of sites known to exist on the Missouri side of the Mississippi River floodplain is low. In the 13 intervening years since 1982, additional sites must have been found and registered. It would be reasonable, therefore, to assume that at least six additional sites were registered per year, which would add 78 sites to the total for the floodplain in Missouri.

TABLE 1
 Flood Plain Management Assessment (FPMA) Project
 Official Site Counts for the State of Missouri
 by County for the St. Louis District Study Area

Missouri County	Number of Known Cultural Sites
Mississippi	3
Scott	36
Cape Girardeau	14
Perry	2
St. Genevieve	40
Jefferson	38
St. Louis	111
St. Charles	7
Lincoln	12
Pike	33
Ralls	4
TOTAL	300

TABLE 2
 Flood Plain Management Assessment (FPMA) Project
 Official Site Counts for the State of Illinois
 by County and River Floodplain for the St. Louis District Study Area

Illinois County	Number of Known Cultural Sites	
	Mississippi R.	Illinois R.
Alexander	50	
Union	85	
Jackson	193	
Randolph	134	
Monroe	437	
St. Clair	128	
Madison	220	
Jersey	5	36
Calhoun	12	37
Greene		46
Pike	208	58
Scott		76
Morgan		64
Brown		22
Cass		49
TOTAL	1,472	388

Second, the site count for the lower reach of the Illinois River is known to be low, according to personnel of the Illinois State Museum. In this case, many newly located sites have yet to be registered in the GIS database. It is reasonable to assume that the official count of 388 sites for the lower 80 miles of the Illinois River would be inflated by at least 10 percent, once all the sites are entered in the database. This would add 39 to the existing 388 for a total of 427 historic and prehistoric sites on the Illinois River within the FPMA study area. These two adjustments alone bring the previous total of 2,160 known sites to 2,277.

Data from two recent surveys can also be used to adjust upward the total count of cultural sites in the FPMA study area. The earlier of these surveys occurred in the summer of 1988, when an approximate 30-year low water episode allowed a portion of the Middle Mississippi River to be examined for historic shipwrecks. A field crew of four USACE St. Louis District personnel conducted an aerial survey of both banks and side channels of the Mississippi, between St. Louis and Cairo. When wrecks were located, the helicopter carrying the crew was landed, and the dimensions of the wrecks were recorded. Photographs were taken and the map location of each wreck was determined. Later, archival documents were consulted and attempts were made to identify each wreck. This survey located 39 previously unknown shipwrecks; by comparison, contemporary accounts and archival descriptions indicate that 704 shipwrecks occurred in the St. Louis District prior to 1940.

The second, more recent survey having useful data about new sites took place during the summer of 1993. This survey was completed by personnel from the Center for Archaeological Investigations at Southern Illinois University, Carbondale. The focus of the survey project was a roughly 4 square mile area of Mississippi River floodplain at Dogtooth Bend, Alexander County, Illinois. A series of 21 survey quadrats totalling 840 acres was systematically surveyed within the project area. Separate surveys in these 40-acre, randomly selected tracts identified 92 archaeological and historic sites. Of this total, five sites were previously known and 87 sites were newly discovered.

The results of the shipwreck survey, and the work at Dogtooth Bend are yet to be forwarded to the Historic Preservation Offices of Illinois and Missouri. The data gathered by these two surveys would increase the total of sites within the FPMA study area from 2,277 to 2,403. Information from these surveys also strongly suggests that more than 39 shipwrecks would likely be found within the Mississippi floodplain of the St. Louis District, and that more than 87 new prehistoric and historic sites are extant in the Dogtooth Bend area. A conservative assessment of the potential for additional historic shipwrecks suggests that at least another 100 may exist within the Mississippi floodplain. This number is based on the assumption that half of the 700 ships that wrecked were preserved at least in part, after the disaster. Half again of these (175) may have avoided more recent destruction due to farming, flood, development, and other post-shipwreck perturbations. Finally, assume that about two-thirds (100) of the remainder are potentially locatable given our current landuse patterns, technology, environmental conditions, funding, and other factors. In sum, of the 704 shipwrecks known to potentially exist within the St. Louis District, it may be possible to locate about 100 more to add to the 39 already known.

The survey data from Dogtooth Bend tell us much about the potential for additional sites in that area as well. Although not all of the unsurveyed floodplain in Dogtooth Bend will yield additional cultural sites because of fairly recent, multiple meander scars, numerous presently unknown sites are certainly located in areas of relatively higher, more stable fluvial deposits. Findings from the randomly selected 40-acre sections already surveyed argue that it is reasonable to expect at least half as many new sites in the areas not yet surveyed. Therefore, an additional 43 sites are likely. Probable

archaeological and historic sites in the FPMA area can be increased from 2,403 to 2,546 with the addition of the 100 shipwrecks and 43 Dogtooth Bend sites.

Although the FPMA study area does not include any tributaries other than the Illinois River, the consequences of major floods in these areas should not be underestimated. For example, the Big Muddy and the Kaskaskia have several hundred archaeological sites listed in the GIS database at the Illinois State Museum. In the five counties along the lower Kaskaskia below Carlyle Lake, there are 230 sites in the floodplain. In the four counties of the lower Big Muddy below Rend Lake, 205 sites are known in the floodplain. When a flood of the magnitude experienced in 1993 occurs, prehistoric and historic sites along the tributary rivers will be affected negatively.

POTENTIAL SITE DENSITY WITHIN THE FPMA STUDY AREA BASED ON SURVEY DATA

Considering all the official site records presently available for the Mississippi floodplain, the Illinois floodplain, plus the arguments noted above for upward adjustments in site counts, there are easily more than 3,000 sites in the FPMA study area of the St. Louis District. However, even though partly an estimate, this figure must be viewed as an absolute minimum number of sites. Archaeological survey data present clear evidence that the total number of sites in the study area could be in excess of 8,000 to 9,000 sites.

In the Dogtooth Bend area, instead of assuming that only 43 new sites remain to be discovered as was argued above, the total number of potential sites could be based on the site density determined during the survey. That is, the systematic field survey recently conducted in Dogtooth Bend identified one prehistoric or historic site every 9 or 10 acres. Applying this density to the entire 36,000 to 40,000 acres of Dogtooth Bend indicates that a great many archaeological sites could exist in the area. Assuming that half of the area is relatively stable, older ground surface which could contain historic or archaeological deposits; and further assuming that half of the remaining land is largely undisturbed by urban development, deep plow farming, and other modern post-depositional processes, then the remaining 9,000 to 10,000 acres could contain 900 to 1,000 cultural properties.

Survey data from the FAI-270 salvage archaeology project can be used to project probable site numbers for another large portion of the Mississippi floodplain. In the project summary volume "American Bottom Archaeology", Bareis and Porter (1984) summarize the testing and mitigation of sites that were discovered during survey of the highway 270 right-of-way. In a corridor roughly 21 miles long and several hundred feet wide, 59 sites thought to be eligible for the National Register of Historic Places were located. Thus a linear survey of about 1,000 acres of land in the American Bottom encountered one potentially significant prehistoric or historic site about every 17 acres. If the entire American Bottom contains about 270,000 acres, and half of those acres (135,000) are slightly elevated, relatively habitable land, and half of the remaining acres (67,500) are largely undeveloped and may still contain significant cultural resources, then there is a potential for nearly 4,000 archaeological and historic sites to be located in the area.

Although the surveys in Dogtooth Bend and the American Bottom detail the richness of the historical and archaeological landscapes in specific, defined regions, the data suggest that several thousand additional, unknown sites could exist outside of those two areas. That is, if similar bottomlands were to be included in the estimates for total unknown sites, the potential number for the entire St. Louis District could be staggering. However, considering just the surveys mentioned above,

along with the previous discussion of known or probable sites within the FPMA study area, it is clear that 8,000 or more cultural sites potentially exist in the present study area.

POTENTIAL SITE DENSITY AND SITE SIGNIFICANCE

It is very important to note that the existence of 8,000 sites within the FPMA study area does not mean that there are 8,000 highly significant properties which must be protected at all cost. Instead, experience suggests that of all the sites identified during systematic survey, or unexpectedly encountered during construction, earth moving, or other development, about 20 percent are found to be eligible for the National Register of Historic Places. This is a broad generalization which may or may not continue to reflect the truth, given changing land-use patterns, changing governmental and Corps policy, and changing opinions concerning the use and abuse of the National Register itself. However, harsh warnings notwithstanding, it is important for planners to realize that roughly 1 in 5 historic or prehistoric archaeological sites will be considered potentially significant and may require extensive and expensive mitigation.

Within the defined FPMA study area in the St. Louis District, if roughly 8,000 historic and prehistoric cultural sites exist, then it is probable that at least 1,600 of them are significant properties. Again, it is probable that many more than 8,000 sites are extant in the FPMA study area; and it is nearly certain that thousands more sites exist within the larger district outside of the study area. And for every 1,000 sites which may exist, at least 200 sites are likely to be significant.

SITE SIGNIFICANCE, SITE LOCATION, AND SITE TYPE

The significance of a site is determined by many variables. In the context of this study, the two most important variables are site type and site location. Together, these factors will also relate to the rarity of the site; altogether, rarity, location, and type will inform on the overall quality of the property. Location is important because certain categories of sites tend to occur in specific physical locations. Thus, if a prehistoric Mississippian household site (circa AD 1000 to 1400) was normally located on raised land within the ridge and swale region of the river bottoms, any Mississippian settlements found outside of this physiographic region might be considered more valuable scientifically. In this case, an unusual site location would suggest greater significance. On the other hand, Emergent Mississippian sites (circa AD 800 to 1000) are known to occur on both the river floodplain and the adjacent uplands. Location with these sites may not add to their value.

Assessment of site quality, or integrity, or preservation is often thought to be of utmost importance. However, continuing the example of a Mississippian village or household site, considerable excitement might be caused if the common bean were to be found at any such site. Even if the site were somewhat disturbed or lacked some aspects of quality, if the context of the floral assemblage could be demonstrated as prehistoric, then even an imperfect Mississippian site with carbonized beans would be important.

Site type and rarity are often related. For example, in the American Bottom, it is thought that most Early Woodland (circa 600 to 150 BC) and Middle Woodland (circa 150 BC to AD 300) sites lie deeply buried in the floodplain. While some sites of this era may occur in upland locations, the vast majority are found along old lake margins, near marshes, and associated with low swales in the

floodplain. Because of sedimentation and destruction of these sites by river channel migration, well preserved Early Woodland and Middle Woodland may be considered a local rarity.

Some historic properties within the study area may also be considered rare finds. For example, it is a distinct possibility that a keel boat may one day be discovered somewhere in the bottomlands of the St. Louis District. Watercraft from early trapper and historic Native American contexts may also be extant, preserved in very specific locations such as oxbow lakes, historic portages, and in older, stable wetlands. Such protohistoric finds would no doubt be important both on a regional and a national scale. It should be clear that the determination of significance is a complex issue which, at the very least, considers site type, location, rarity, and preservation.

**HISTORIC OVERVIEW
for the Missouri River
FLOODPLAIN MANAGEMENT ASSESSMENT**

by Lauren W. Ritterbush (editor)
University of Kansas, Museum of Anthropology

September 1994

The stated objective of the Historic Overview for the Floodplain Management Assessment is to develop a description of those geographic and geomorphologic characteristics that influenced prehistoric and historic occupation and development of the base floodplains of the Missouri River and selected tributaries. The project area includes the Missouri River from its confluence with the Mississippi River upstream to Rulo, Nebraska; the Grand River from its confluence with the Missouri River upstream to Pattonsburg, Missouri; and the Kansas River from its confluence with the Missouri River upstream to Milford Lake, Kansas. This Historic Overview describes the physical characteristics influencing human use and development of the relevant portion of the river valley and prehistoric and historic cultural chronologies for each defined study area, outlining the types of significant cultural and historic properties within the project area.

The Historic Overview of the project area has been segmented into the following study areas:

- A. The Missouri River from Rulo, Nebraska, downstream to Glasgow, Missouri
- B. The Missouri River from Glasgow, Missouri, downstream to St. Charles, Missouri
- C. The Missouri River from St. Charles, Missouri, downstream to its confluence with the Mississippi River at St. Louis, Missouri
- D. The Kansas River from Milford Lake, Kansas, to its confluence with the Missouri River
- E. The Grand River from its confluence with the Missouri River upstream to Pattonsburg, Missouri

Insufficient geomorphic study has been undertaken in each of these study areas, except possibly the Kansas River valley. An understanding of the geomorphic and geographic factors influencing human use of the study areas, as well the preservation of cultural deposits therein, is limited. Concerted geomorphic research in these study areas is necessary to complete our understanding of these factors. Likewise, archaeological investigations of the Missouri, Grand, and Kansas River valleys have been limited. In most cases information derived from surrounding areas must be utilized in outlining the prehistoric and historic cultural chronology of the project area. As of early 1981 ninety-six archaeological sites had been recorded along the Missouri River between Rulo, Nebraska, and its mouth near St. Louis, Missouri (Anonymous 1981:18). These occur along the bluff edges and slopes, river terraces, and floodplain. Among those 96 are five listed on the National Register of Historic Places. No doubt numerous other sites have been and remain to be recorded along this stretch of the Missouri River, as well as along the Kansas and Grand rivers. Evaluation of these sites will likely result in more nominations to the National Register of Historic Places.

A. The Missouri River from Rulo, Nebraska, downstream to Glasgow, Missouri
by Lauren W. Ritterbush

Past human settlement was strongly influenced by geographic and geomorphic factors. As a rich environmental zone in the prairie-plains of central North America, the Missouri River valley was a favored area of resource exploitation for native and immigrant populations. Certain factors, such as flooding and drainage, may have made occupation of the base floodplain precarious and unpleasant at times. Nonetheless, more suitable terrace or upland surfaces in and adjacent to the valley were preferred habitats for prehistoric and historic populations. This is shown in the archaeological and historic record of the Missouri River region. This record is as yet incomplete, since archaeological and historical studies of the immediate surroundings of the River have been limited. Add to this the effects of natural and cultural processes on archaeological and historical remains. Many of these processes have damaged or destroyed these irreplaceable resources. In other cases, they have been buried out of sight. A review of existing geomorphological, archaeological, and historical information from the study area provides an understanding of the geographic factors influencing past human utilization of the project area and the preservation of its associated cultural resources, the chronology of prehistoric and historic use of the area, and the types of significant properties located therein.

Physical Characteristics

This stretch of the Missouri River extends from Rulo, Nebraska, near the Kansas-Nebraska border south-southeast to the Kansas City locality around the mouth of the Kansas River, then eastward to the Big Bend region of central Missouri (Glasgow, Missouri). This study area is in the Dissected Till Plains of the Central Lowlands with that reach east of Kansas City near the northern border of the Osage Plains (Fenneman 1938). As the name implies for the Dissected Till Plains, the topography of this physiographic region is determined by erosion of Pleistocene glacial till and loess. Schoewe (1949:289) describes this area in northeastern Kansas as follows:

...the topography is an erosional drift-controlled surface which in general may be described as gently undulating. Interstream areas or divides remote from major drainage lines are smooth, broad, and well rounded and are the remnants of the original uneroded ground moraine topography left on the retreat of the ice. Approaching the larger stream courses the country becomes more dissected, the surface is all reduced to gentle slopes, and the valleys are wide and open. Adjacent to the larger streams the country is highly dissected into a rough and hilly region.

The latter two statements clearly fit the Missouri River valley and nearby surfaces. Loess deposits up to 50 feet thick mantle upland surfaces adjacent to the Missouri River valley, especially above Kansas City, and thin generally to the east (Schmudde 1960:14).

The Missouri River valley is 100-400 feet deep with steep valley walls. This is not as pronounced on the north side of the valley in the lower reach of this section of the Missouri River, namely between Lexington and Glasgow, Missouri (Schmudde 1960:14-19). This lower reach is also interesting in that it is one of the widest, averaging 6.6 and ranging up to 10 miles wide. A relatively narrow reach about 2.5 miles wide near Miami, Missouri, interrupts the wide Lexington to Glasgow section (Schmudde 1960:36-55). Throughout this study area, the Missouri River valley ranges from about 1.6 to more than 10 miles wide (Schmudde 1960:36-55; Schoewe 1951:274). One stretch at the northern end of the study area near Rulo, Nebraska, is more than 10 miles wide. A lesser widening (up to 5.4 miles wide) exists just below St. Joseph, Missouri (Schmudde 1960:36-55).

Much of the valley floor is occupied by floodplain that has undergone active alteration throughout prehistoric and historic times. These areas may have been, at least seasonally, unattractive for occupation due to flooding or poor drainage. Adjacent terraces above the floodplain were more suited to human use. It is these areas that deserve the most concerted (although not exclusive) investigation.

No detailed geomorphic studies of terrace sequences have been completed for the Missouri River valley between Rulo, Nebraska, and Glasgow, Missouri. Davis (1955) identified two terraces along the Missouri River in Platte County, Missouri, and suggested a Wisconsin affiliation. Geomorphic studies in Kansas indicate that the ages of these terraces need to be evaluated using modern dating techniques (Johnson and Martin 1987:113). Other geomorphic studies in western Missouri have been limited and focused on tributary streams rather than the Missouri River (e.g., Little Blue drainage [D. Johnson 1978; Kopsick 1980, 1982; Filer 1985; Mandel 1985]; Little Platte drainage [Gardner and Donahue 1985]). At this time geomorphic information related to the identification of possible surfaces associated with past human use can be hypothesized from Davis (1955), limited soil survey information, and Schumde's "Landform Geography of the Lower Missouri River Valley" (1960).

Like Davis (1955), Schumde (1960:185-215) recognized as many as two surfaces above the primary floodplain between Rulo, Nebraska, and Glasgow, Missouri. The primary floodplain generally is that area often on both sides of the river that has been reworked since about A.D. 1879. This floodplain may be relatively smooth, but commonly has an irregular undulating surface. Above the floodplain are one or two surfaces, separated from the next lower surface by a scarp five to 15 feet high.

These upper surfaces or terraces are not common between Rulo, Nebraska, and Leavenworth, Kansas, where one surface with numerous abandoned channels and oxbow lakes predominates the valley (Schumde 1960:200-209). Isolated terrace remnants, including an area of high terrace just below St. Joseph, are present, as well as benches of relatively recent slopewash (alluvial fans) along the east side of the valley in Holt County, Missouri (Schumde 1960:200-209; Schrader *et al.* 1956). Terraces are also not widely evident between Leavenworth, Kansas, and Missouri City, Missouri (possibly due to the narrower river valley and effects of the Kansas River on flooding below its mouth). Much of the primary floodplain along this stretch of the valley has a relatively smooth surface with few abandoned channels. The terrace remnants are low and usually associated with tributary streams (Schumde 1960:196-200). Two terrace surfaces are recognized above the primary floodplain below Missouri City (Schumde 1960:185-193). Cooley and Fuller (1976:24) observed two in Chariton County, Missouri, and describe them as

a moderately weathered terrace approximately thirty to fifty feet in height, situated against the valley walls and extending into some of the tributary valleys; and an unweathered terrace situated approximately ten feet above the present floodplain.

The soil survey of Saline County, Missouri, identifies a high terrace between the uplands and the floodplain of the Missouri River (Baker 1993). It is described as 60-70 feet high with 20-30 feet of loess atop glacial drift.

It is not surprising that terraces are not widely preserved in the Missouri River valley given the frequency and extent of channel changes in historic times. Hydrological information derived from maps and aerial photographs for the period from A.D. 1879-1954 indicates that the Missouri River channel was constantly changing prior to modern control measures of the U.S. Army Corps of Engineers (Schumde 1960:134-147). Most of the changes resulted from progressive lateral and downstream movement of the river channel. This results in reworking of the bottomlands through bank erosion and backfilling. In some instances meander cut-offs resulted in drastic relocations of the river channel. This appears to have occurred most often in the wider portions of the Missouri River valley (Schumde 1960:140-145).

The relevance of this information to understanding the prehistory and history of the study area lies in defining possible locations of past human use and intact cultural remains. Reworked bottomlands, for instance, will not contain unaltered cultural deposits older than their date of formation. Isolated areas of intact deposits may be found as unworked remnants of the floodplain left when meander cutoffs quickly changed the course of the channel (Schumde 1960:145). Schumde's (1960:136-144) maps of the reworked floodplain of the Lower Missouri River between A.D. 1879 and 1954 indicate areas unlikely to contain intact prehistoric and early historic deposits.

River changes prior to A.D. 1879 have not been documented and deserve concerted systematic geomorphic study in order to delineate possible areas of earlier intact deposits. Remnants left by meander cutoffs, as well as other areas showing little change, such as between Leavenworth, Kansas, and the mouth of the Nodaway River and between Waverly and Lexington, Missouri (Schmudde 1960:145-147), should be tested for intact deposits. That prehistoric and historic remains have been preserved on the Missouri River floodplain is shown by Cooley and Fuller (1976), who located at least three archaeological and historic sites during a levee survey along the Missouri River in Chariton County. Buried deposits, such as in terrace fills and below alluvial fans, may also contain intact archaeological remains.

Cultural Historical Overview

The cultural chronology of the Missouri River valley from Rulo, Nebraska, to Glasgow, Missouri, extends from Paleoindian times up to the present. Unfortunately, a thorough understanding of past human use of the valley has not been obtained. Few archaeological studies have focused specifically on the immediate environs of the Missouri River. This is due in part to the limited number of archaeological studies conducted in the Missouri River valley and to geomorphic considerations that affect site preservation and visibility. As noted earlier, few geomorphic studies have been conducted to aid in the identification of possible intact deposits. Cultural materials were likely buried below terraces formed since the end of the Pleistocene. Given the active nature of the Missouri River, many of these may have been removed or concealed. Much of our knowledge about the past human utilization of the Missouri River valley is extrapolated from information derived from archaeological investigations along tributary streams and neighboring regions.

Paleoindian Period

The earliest documented cultural period in North America is Paleoindian. This period is poorly represented in Kansas and Missouri, although not without some evidence of human presence during the period from about 10,000-8,000 B.C. Clovis, Folsom, and a variety of Plano projectile points are the most commonly identified Paleoindian cultural materials. The people who used these tools lived at a time of generally cooler and wetter conditions with vegetation patterns different than today. They lived in small, mobile bands and hunted now extinct forms of megafauna, including mammoth, mastodon, and bison (Frison 1978; O'Brien 1984:27-35; C. Chapman 1975:60-94).

No undisturbed Paleoindian sites have been investigated in the study area. Diagnostic remains have been found as scattered surface finds including Clovis, Folsom, Scottsbluff, and Plainview points (C. Chapman 1975:66-67,75,102-105; Wedel 1959:175; Shippee 1948:30, 1950:164, 1957:43; 1964:1-5; Witty and Marshall 1968; Estep 1993:14). Many of these finds are from upland surfaces above or away from the Missouri River. Their frequent association with other assemblages, especially Late Archaic (Nebo Hill) in the Kansas City area, suggests the possibility that similar settlement patterns were followed by early hunter-gatherers in the region.

Dalton Period

The end of the Paleoindian period and beginning of the Archaic period are associated with changing climatic conditions and a related shift in human economy in eastern Kansas and western Missouri. During this time an increased reliance on smaller game and a more diversified economy, including gathering of plant foods, is evident. This is referred to as the Dalton period from about 8,000-7,000 B.C. (C. Chapman 1975:95-126). Remains of this period, like those of the earlier cultural tradition, are poorly documented. Scattered surface finds of Dalton points provide the best record of Dalton period occupation along the lower Missouri River valley and are often found along hilltops or hillslopes (C. Chapman 1975:102-105; Shippee 1964:4-5; Estep 1993:14).

Archaic Period

The Archaic period from about 7,000-1,000 B.C. is associated with a hunting and gathering economy based on harvest of diverse wild plant and animal resources. The environment of northwestern Missouri and

northeastern Kansas was likely mixed prairie and deciduous forest similar to modern times. During the early portion of this period (Early Archaic, approximately 7,000-5000 B.C.) an expanded population developed technologies adapted to the prairie-forest environment and its diverse resources. This continued into the Middle Archaic (approximately 5,000-3,000 B.C.) with possible emphasis on small game and wild plants due to warmer and drier conditions associated with the Hypsithermal (C. Chapman 1975:158-159). Local adaptations were well established by Late Archaic times (approximately 3,000-1,000 B.C.) as evident by occupation, harvest, and use of a variety settings, resources, and technologies.

Little direct evidence of Early and Middle Archaic occupation of the Missouri River valley between Rulo, Nebraska, and Glasgow, Missouri, has been recorded. One interesting find radiocarbon dated at $4,750 \pm 250$ and $5,875 \pm 105$ B.C. is the Lansing Man site (14LV315) (Williston 1902; Wedel 1959:90-93; O'Brien 1984:41-42). This site buried below 20 feet of loess on a small bench overlooking the Missouri River in Leavenworth, Kansas, contained the remains of an adult male and child of 6-7 years. Although little cultural information was retrieved from the site, it has been listed on the National Register of Historic Places. A growing base of data on Early and Middle Archaic in western Missouri is derived from surveys and excavations along tributary streams of the Missouri River. Sites 23JA160, 23JA161, and 23JA181 above the Little Blue River valley indicate Early Archaic use of upland settings (Schmits *et al.* 1989:513-514).

Late Archaic evidence is more common, especially in the Kansas City Locality. The Nebo Hill phase of the late Archaic was defined primarily on the basis of excavations at the Nebo Hill site (23CL11), located on a blufftop overlooking the Missouri River valley in the eastern portion of the Kansas City metropolitan area (Reid 1984). This site is listed on the National Register of Historic Places. The Turner-Casey site (14JA35) and 23JA170 are similar upland Nebo Hill sites above the Little Blue River (Schmits and Wright 1989; Journey 1989), and the Sohn site (23JA110) represents a lowland Nebo Hill site along the Little Blue (Reeder 1980). The distinctive long, narrow lanceolate points diagnostic of Nebo Hill are found elsewhere in the Kansas City locality and along tributary streams in eastern Kansas and western Missouri (e.g., Shippee 1948, 1957, 1964; B. Logan 1986:4). A growing population of Archaic hunters and gatherers is evident for the Nebo Hill phase with well developed technologies for exploiting forest resources (Reid 1984). The earliest pottery in the region has been found at Nebo Hill phase sites.

Woodland Period

The Woodland period from about 1,000 B.C. to A.D. 900 saw continued growth and expansion of populations along the Missouri River. This period is characterized by widespread use of ceramics, rudimentary cultivation of native and tropical domesticates, growing social stratification (as evident from burial associated with mounds), and expanded interregional interaction.

The Early Woodland period from as early as 1,000 B.C. to nearly A.D. 1 is poorly represented in this portion of the Missouri River valley. The best documented sites in the region are lowland sites along the Little Blue River and its tributaries in the Kansas City locality. These include the Traff (23JA159) and Bowlin Bridge (23JA38) sites, 23JA36, and 23JA40 (Wright 1980; Peterson 1989; Ziegler 1985a, 1985b:85-112; Schmits and Bailey 1989:515-517). A few ceramics recovered from these sites are similar to those found at Early Woodland sites elsewhere in the Midwest. Radiocarbon dates place them between about 500-300 B.C.

Middle Woodland remains are relatively common along the Missouri River from northeastern Kansas-northwestern Missouri to the Big Bend region of central Missouri. Two Hopewellian complexes, the Kansas City Hopewell and the Central Missouri Hopewell have been defined along this stretch of the Missouri River. Kansas City Hopewell sites have been recorded along the Missouri River and the lower portion of its tributaries in Doniphan, Leavenworth, and Wyandotte counties, Kansas, and Platte, Clay, and Jackson counties, Missouri (A. Johnson 1976a, 1976b; P. Katz 1969; and others). Villages commonly located near bluff lines of tributary and major rivers appear to have been intensively occupied, while seasonal hunting and gathering camps in the valleys of tributary streams were less intensively utilized (A. Johnson 1976b, 1979). The Renner (23PL1) and Deister (23PL2) sites are examples of these two types of sites, respectively, and both are listed on the National

Register of Historic Places (Wedel 1943; Roedl and Howard 1957; S. Katz 1974). The Aker (or Babcock) (23PL43) and Sibley (23JA73) sites are also on the National Register and may be unique in that they are located on terraces of the Missouri River. (Others like them may remain buried in alluvium along the Missouri River where they have yet to be discovered.) Two (probably related) Hopewell sites at Fort Leavenworth, the Quarry Creek (14LV401) and McPherson (14LV357) sites, are on or have been determined eligible for the National Register of Historic Places (B. Logan 1993; Wagner *et al.* 1989). Hopewell economy was based on hunting deer, turkey, and other animals; fishing, and gathering wild nuts and seeds, supplemented by early horticulture (E. Johnson 1972; Adair 1977, 1988, 1993). Earthen mounds covering stone-vault tombs, contain a variety of burial types and are commonly found on blufftops near villages (Wedel 1943:106-108). Three phases of Hopewell development have been defined on the basis of ceramic stylistic change (Johnson and Johnson 1975). These are the Trowbridge phase, A.D. 1-250; the Kansas City phase, A.D. 250-500; and the Edwardsville phase, ca. A.D. 400-650 (Johnson and Johnson 1975; C. Chapman 1980; B. Logan 1993:187-188).

The point of origin of this Hopewellian tradition on the edge of the Plains has been suggested to be the Lower Illinois River valley through migration and/or interaction (Wedel 1943; A. Johnson 1979; Kay and Johnson 1977). The presence of similar Hopewell sites along a lower reach of the Missouri River in Central Missouri may add support to this hypothesis. Two phases of Central Missouri Hopewell, the Big Bend and Lamine, have been identified from a network of sites near the mouth of the Grand River above Glasgow, Missouri, and a major village and smaller satellites along the lower Lamine River below Glasgow (Kay 1979, 1980). The focal site of the Lamine phase, the Mellor site (23CP1), is located on an alluvial terrace along the Missouri River at the confluence of the Lamine River, whereas the Fisher-Gabert (23SA128) and Givens (23SA1) sites are on upland slopes above the Missouri River (Kay 1980:13, 20, 22). Fisher-Gabert is listed on the National Register of Historic Places. Like the Kansas City Hopewell, hunting and gathering diverse resources formed the subsistence base. Chronological placement of the Central Missouri Hopewell is roughly A.D. 100-400 (Kay 1979:96, 1980:25-26).

The early part of the Late Woodland period (A.D. 500-800 [A. Johnson 1983] or A.D. 400-650 [B. Logan 1993:187-188]) coincides in the Kansas City area with the latest, Edwardsville, phase of the Kansas City Hopewell. This phase reflects continued Hopewell influence in the region, but with changes most apparent in ceramic and projectile point styles, namely undecorated or crenated rims and arrowpoints along with earlier corner-notched dart points. Assemblages from later Late Woodland (or Plains Woodland) sites include cordmarked sherds and a higher percentage of small triangular corner-notched arrowpoints. Late Woodland materials have been found at sites in Platte County, Missouri, along Brush Creek; in Jackson County, Missouri, at Sperry (23JA85) and other sites along the Little Blue drainage; and in Wyandotte County, Kansas, at the Island Creek site (14WY104) along a small tributary of the Missouri River (A. Johnson 1974; K. Brown 1985b; O'Malley 1979; Brown and Ziegler 1985; Schmits 1989; Fosha 1988). The latter site is listed on the Register of Historic Kansas Places. Late Woodland in other portions of the Missouri River valley of northeastern Kansas and western Missouri is poorly documented.

Mississippian Period

The Mississippian period is characterized by semi-sedentary hunter-gatherer-gardeners, who made shell-tempered, smooth-surfaced pottery and small triangular side-notched arrowpoints. This period is best characterized in the study area by the Steed-Kisker phase, which dates from about A.D. 950-1400 (Logan and Ritterbush 1994). This phase has been linked to Cahokia at the mouth of the Missouri River and is believed by some to represent a migrant population of farmers who served as middlemen in a Mississippian trade network between the prairie-plains region and Cahokia (O'Brien 1978b; Wedel 1943; cf. Calabrese 1969; McHugh 1980). Steed-Kisker sites have been recorded along the valley slope and uplands of the Missouri River and on terraces of tributary streams in Atchison, Leavenworth, and Wyandotte counties, Kansas, and in Platte and Clay counties, Missouri (B. Logan 1985, 1988; Witty and Marshall 1968; Wedel 1943; Calabrese 1969; Shippee 1972; O'Brien 1978a, 1978b; McHugh 1980).

The Central Plains Tradition of the Plains Village pattern is also represented in a portion of the study

area. Nebraska phase materials have been found at several sites along the northern reach of this reach of the Missouri River in northeastern Kansas and northwestern Missouri (Wedel 1959:98-130; Wood 1969; Feagins 1988, 1993:16-17; Estep 1993:17). These assemblages appear to mark the southern edge of the Nebraska core area along the Missouri River drainage. The association of Nebraska ceramics with Steed-Kisker materials may indicate social interaction (e.g., trade, intermarriage, coresidence) between these groups.

Also contemporaneous with Steed-Kisker and Nebraska, but differing in its form of adaptation is the May Brook phase of the Pomona variant (Schmits 1980b, 1982; K. Brown 1985c). The Pomona cultural complex extends throughout much of the eastern third of Kansas and part of western Missouri. No Pomona or May Brook sites have been investigated directly along the Missouri River, but May Brook sites have been recorded in the Kansas City area along the Little Blue River in Jackson County, Missouri (Schmits 1980b, 1982, 1989; Schmits and Reust 1989; K. Brown 1985a). Despite the contemporaneity of this complex with Plains Village and Mississippian period complexes, the Pomona variant appears to be a Late Plains Woodland adaptation influenced by neighboring Plains Village/Mississippian cultural complexes (Witty 1967, 1978:59-62, 1981; cf. Blakeslee and Rohn 1986:1292; K. Brown 1985c). This interpretation is based largely on the limited evidence for horticulture and unclear definition of patterned house forms.

Protohistoric Period

The Protohistoric period includes that period of time following the Mississippian period and before the time when native populations had regular contact with Euroamericans. Although prehistoric lifeways continued much like those of the Mississippian period, the effects of indirect and very limited direct Euroamerican contact was being felt through the introduction of new technology and disease. The cultural complex that best fits this period in Missouri and northeastern Kansas is the late Mississippian Oneota.

Oneota sites are found throughout the Prairie Peninsula and neighboring areas of the Midwest (Harvey 1979:182-205). Their assemblages include diagnostic Mississippian shell-tempered globular ceramic jars decorated with lines and punctates. Other artifacts, including unnotched triangular arrowpoints, end and side scrapers, bifacial knives, scapula hoes, bone awls, and numerous other objects, are similar to those of the earlier Mississippian period. Dates from some Oneota sites indicate overlap with Mississippian complexes as early as A.D. 1,000. Like these other complexes, the economy of the Oneota populations was based on hunting, gathering, and gardening.

Several Oneota sites have been recorded along the Missouri River between Rulo, Nebraska, and Glasgow, Missouri. Three well-known sites have been studied near the northernmost portion of the study area. The Leary site (25RH1) on a terrace along the lower Nemaha River in southeastern Nebraska (Hill and Wedel 1936; Bass 1961) is listed on the National Register of Historic Places. The Fanning site (14DP1) above lower Wolf Creek in northeastern Kansas and the King Hill site (23BN1) on a bluff overlooking the Missouri River in northwestern Missouri have been suggested to be of Kansa affiliation (Wedel 1959:131-172; Shippee 1967; D. Henning 1970:146; Ruppert 1974; Raish 1979). Both are listed on the National Register of Historic Places.

Elsewhere along the Missouri River, such as in the Chariton region along the lower portion of this study area, are other known Oneota sites. Among these are the Utz (23SA2) and Guthrey (23SA131) sites (Bray 1991; Berry and Chapman 1942; D. Henning 1970; Wood 1973). Both are listed on the National Register of Historic Places. Most of these sites are located on slopes above the Missouri River, although the Late Missouri or Gumbo Point site (23SA4), which has an Oneota component, is located adjacent to the river (D. Henning 1970:17). It too is listed on the National Register.

Historic Period

The Historic period of western Missouri and northeastern Kansas starts in the late seventeenth and early eighteenth centuries, when Euroamericans entered the area to establish semi-permanent trading centers. Contact with the Missouri Indians likely dates back to A.D. 1682 and LaSalle's establishment of Fort St. Louis on the

Illinois River. Few documents exist to record early contact between the Missouri Indians and Euroamericans, but it appears that this native group was living at the Utz site during the late seventeenth century (Bray 1978:4-5). The first Euroamerican known to have visited the Missouri at their village along the river of that name was Etienne Veniard de Bourgmont between A.D. 1712 and 1719 (Bray 1978). His information indicates the Missouri had moved west from the Utz site to establish a new village by A.D. 1714. This may have been the Late Missouri or Gumbo Point site mentioned above (C. Chapman 1959; Bray 1978:11-12). The Little Osage Indians also settled along the Missouri River upstream from the mouth of the Grand River after de Bourgmont entered the area (Chapman and Chapman 1964). The Plattner site (23SA3) on a high terrace of the Missouri River was occupied by the Little Osage Indians between about A.D. 1727 and 1777 (D. Henning 1970:19; C. Chapman 1959). The Missouri and Little Osage apparently abandoned the area by the 1790s (Bray 1991:9).

The earliest documented Euroamerican site in this study area is Fort Orleans, established by de Bourgmont in A.D. 1723 and ordered abandoned in A.D. 1727. It was located near the Missouri village of A.D. 1714, most likely the Gumbo Point site (Bray 1978:12-22).

Further up the Missouri River, near the northern end of the study area, is at least one other early historic Native American site. This is the National Register listed Doniphan site (14DP2). Wedel's (1959:98-130) investigations of this site uncovered both a prehistoric Nebraska component and an historic Indian component. The latter has been suggested to be affiliated with the Kansa Indians and is believed to be the site visited by de Bourgmont in A.D. 1724 during his attempt to establish peace among the Indians of the prairies and plains (Bray 1978:14-15; Wedel 1959). The Kansa later established a village nearby at the mouth of Salt Creek, immediately northwest of Fort Leavenworth (Barry 1961:88; Witty and Marshall 1968:5-6; Unrau 1971). This was likely the village occupied by the Kansa (with one possible interruption in the mid-eighteenth century) until A.D. 1800 when they moved to the Kansas River Blue Earth Village. Other Kansa settlements may have existed near the mouth of the Kansas River, but are not clearly documented (Unrau 1971; Bray 1978:14).

The earliest documented Euroamerican site associated with the Kansa along the northern reach of this study area is Fort Cavagnolle. Fort Cavagnolle was established by trader Deruisseau in A.D. 1746 and abandoned in about A.D. 1764 (Witty and Marshall 1968:6-9, citing Nasatir 1952 and Pease 1940; Hoffhaus 1964). This post may have been located near the second Kansa village, which was likely in the Missouri River valley. Remains of these sites (Fort Cavagnolle and the Kansas village) may exist or have existed near (or on) the modern-day Fort Leavenworth Military Reservation. Unfortunately, neither has been identified and may have been destroyed through erosion by the Missouri River (Witty and Marshall 1968:59-61).

The fur trade of the Lower Missouri River was conducted by a number of different individuals under various authorities. The result of this was a chaotic system of trade with the native populations. Realizing the effects of this, the United States government instituted the government factory system in A.D. 1796 (Unrau 1971). Fort Osage, a factory trading post, was established in A.D. 1808 along the Missouri River about 40 miles below the mouth of the Kansas River primarily for the protection and trade with the Osage and Kansa. The site of this post is within the bounds of Fort Osage Park in Jackson County, Missouri, and the Fort Osage Archaeological District (23JA45) of the National Register of Historic Places. (Also included in this park and district are the Kansas City Hopewell Sibley site [23JA73] and several other prehistoric and historic sites [Feagins 1984].)

In A.D. 1804 the Lewis and Clark expedition ascended the Missouri River passing through the study area. The location of their camps along the river are recorded in their notes and maps (Moulton 1986). These form an important part of United States history since it was at many of these camps that some of the earliest geographical and cultural information about the area was recorded. The Lewis and Clark expedition opened wide the door to later traders and explorers of western America.

Another exploring expedition that ascended the Missouri River was the Long expedition of 1819. The advance agent to this expedition established in A.D. 1818 a temporary military cantonment north of present-day Leavenworth on Ilse de Vache or Cow Island. Long's entourage arrived at this cantonment on August 31, 1819,

with the first steamboat to successfully ascend the Missouri River, *The Western Engineer*. Two other steamboats made the trip previous to this but reached only as far as below Franklin and Fort Osage (Hunt and Lorence 1937:11-12). A permanent military presence was established below Cow Island in A.D. 1827 with the founding of Fort Leavenworth in northeastern Kansas (Hunt and Lorence 1937). This Fort oversaw military protection for traveller's along the Oregon-California trail, which crossed the Missouri River at Fort Leavenworth and other crossings in the area (e.g., St. Joseph), and the Santa Fe trail, which originated in the Kansas City area. Fort Leavenworth was also instrumental in negotiating Indian relations and assisting in the Indian Wars in the region and beyond.

Starting with the Treaty of 1825 between the United States government and Kansa and Osage Indians, major removals of native populations in Missouri and Kansas were instigated. By the 1840s much of eastern Kansas had been divided into reservations for local and immigrant tribes. Those Indian groups that were given lands bordering the Missouri River in Kansas (from the northern end of the study area to the mouth of the Kansas River) were the Iowas (1837), Sac and Fox (1837), Kickapoo (1832), and Delaware (1829) (Richmond 1974; Gibson 1963). The Wyandot Indians purchased land in the fork of the Kansas and Missouri rivers in present-day Wyandotte County, Kansas, from the Delaware in A.D. 1843 (Merwin 1906). The Stockbridge (Mahican) Indians were also allowed to settle on Delaware lands south of Fort Leavenworth in the early 1840s (Wagner and McCorvie 1991).

Fur traders remained in the area to trade with the Osage, Kansa, and immigrant Indians. Their establishments often formed the beginnings of later Euroamerican settlements. Randolph Bluffs below the mouth of the Kansas River (near present-day Liberty, Missouri) was the site of one post of the Chouteau family between about A.D. 1821 and 1826, when it was flooded and moved closer to the mouth of the Kansas River (Barry 1972:88, 102-103, 111-112, 127, 131-132, 133). The post at the latter location became known as "Chouteau's warehouse" and developed into a settlement for traders and early settlers. Chouteau's Town, as this place was designated until the late 1830s, formed the foundation for the Town of Kansas or modern Kansas City, Missouri (Hoffhaus 1984; Adair and Hedden 1992). Likewise, Joseph Robidoux established a post further up the Missouri River near Blacksnake Creek in A.D. 1826. The town of St. Joseph, Missouri, developed a decade later around his post.

By A.D. 1821 most of the Euroamerican population of the region was centered along the Missouri River. Statehood was granted for Missouri in that year and with it came increased numbers of Euroamerican immigrants who spread over a larger portion of the state. Many of the early settlers in central Missouri were from southern states, while later immigrants included a number of Germans (Cooley and Fuller 1976).

With the influx of settlers came the establishment of a number of towns along the Missouri River including Independence, Westport, Kansas City, Brunswick, Keytesville, (Old) Chariton, Weston, Leavenworth, Atchison, and others. By the 1840s Independence and Westport were major trade and outfitting centers for westward bound immigrants (Bernard 1906). The town of Leavenworth and nearby Fort Leavenworth served their role in westward migration as the site of an important river crossing and along a branch of the Oregon trail. Private businesses contracted to the Fort provided extensive freighting services along the Santa Fe and Oregon trails. Brunswick, Keytesville, and Buckhorn Landing in central and Weston in northwestern Missouri were established by the mid 1830s as river landings until major shifts in the course of the Missouri River curtailed their era of river trade (Smith and Gehrig 1923:238-239; Cooley and Fuller 1976:68-69). The modern town of Weston recognizes its historical district through its listing on the National Register of Historic Places. Ferries were maintained at other river towns, such as Atchison and Leavenworth, Kansas.

River landings served steamboats (as well as other watercraft) that plied the Lower Missouri River between A.D. 1819 and the early twentieth century. These craft transported goods and people within Missouri and Kansas, as well as far beyond to the Upper Missouri fur trade posts, mining camps, military posts, etc. Along the route many steamboats succumbed to sandbars, snags, rocks, explosions, and other hazards. One wrecked steamboat, the *Arabia*, has been found and salvaged upstream from Kansas City. Its remains and history form the basis for a museum in Kansas City, Missouri. A proton magnetometer survey along Cut-off

Lake in the Missouri River floodplain between the mouths of the Grand and Chariton rivers was unsuccessful in locating possible remains of the *Waverly* or *George C. Wolf* steamboats, which are known to have gone down in Bowling Green Bend (now Cut-off Lake) (Grantham and McMurry 1980). More than 75 steamboats went down along the Missouri River between Rulo, Nebraska, and Glasgow, Missouri (Chittenden 1897; McDonald 1926; Cooley and Fuller 1976). Few have been raised.

As a proslavery state, Missouri continued ties with the southern states. In Kansas, on the other hand, the legality of slavery was determined through public vote. Towns such as Atchison and Leavenworth, Kansas, on the Missouri River developed as proslavery settlements. Short-lived Quindaro, Kansas, was established in A.D. 1857 as a free-state port of entry into the new territory. This settlement later became home to an African-American community called Happy Hollow (Schmits 1988). The various backgrounds of the immigrants in the state of Missouri and in Kansas Territory led to mixed viewpoints over the issue of slavery and occasional minor skirmishes occurred. During the Civil War several battles were fought in the area. This includes the September 1861 battle in which Major General Sterling Price's Confederate troops defeated Union soldiers to take over the river port of Lexington. The history of this battle is recognized at the Battle of Lexington State Historic Site. Probably the best known skirmish along the Missouri River was the Battle of Westport, which occurred in late October 1864. This was the last full-scale western battle of the Civil War.

From prehistoric to historic times the Missouri River served as an important communication and transportation route. As time passed, other lines of communication and transportation developed. Most noteworthy is the Pony Express, which originated in St. Joseph, Missouri, on the northern reach of the study area. This express crossed the Missouri River and proceeded westward carrying the mail from A.D. 1860 through much of 1861, when it was replaced by telegraph service. Railroads also enter the area in the 1860s. Seeing the potential link between railroads and economic growth, a number of towns vied for access to newly planned railroad routes. Kansas City, Leavenworth, and St. Joseph, for instance, sought to be the bridging location of railroads over the Missouri River. In late 1865 the Pacific Railroad of Missouri arrived at Kansas City and the Hannibal Bridge was completed in A.D. 1869 (Brown and Dorsett 1978). Somewhat later railroad bridges spanned the Missouri at Glasgow, Sibley, Leavenworth, Atchison, St. Joseph, and Rulo. As roads developed in the latter part of the nineteenth and into the twentieth centuries road bridges were constructed at St. Joseph, Atchison, Leavenworth, various localities in the Kansas City metropolitan area, Lexington, Waverly, Miami, and Glasgow.

With the coming of the railroad and the expansion of roads throughout Missouri and Kansas, the importance of the Missouri River as the primary transportation and communication route dwindled. Towns along its banks either diminished or became focused on other concerns, such as trade, industry, or farming. Towns, such as Kansas City, passed through new eras of development focused on trade in cattle, grain, and other commodities (Brown and Dorsett 1978). Other areas maintained a more rural setting based on agriculture (March and Stephens 1977). Tobacco farming was continued by many southern immigrants well into the nineteenth and twentieth centuries. Less labor intensive crops, such as corn, oats, rye, and wheat, also have been introduced. Livestock production became important in the twentieth century.

Today much of the Missouri River valley in northeastern Kansas and western Missouri, except in the Kansas City area, remains in relatively rural settings where farming the rich bottomlands is a major industry. State and federal highways follow portions of the valley and cross the river at several locations, shortening the otherwise long river route through the region.

B. The Missouri River from Glasgow, Missouri, downstream to St. Charles, Missouri by Orval E. Shinn and Lauren W. Ritterbush

Past human settlement was strongly influenced by geographic and geomorphic factors. As a rich environmental zone in the prairies and woodlands of central North America, the Missouri River valley was a favored area of resource exploitation for native and immigrant populations. Certain factors, such as flooding and drainage, may have made occupation of the base floodplain precarious and unpleasant at times. Nonetheless, more suitable terrace or upland surfaces in and adjacent to the valley were preferred habitats for prehistoric and historic populations. This is shown in the archaeological and historic record of the Missouri River region. This record is as yet incomplete, since archaeological and historical studies of the immediate surroundings of the river have been limited. Add to this the effects of natural and cultural processes on archaeological and historical remains. Many of these processes have damaged or destroyed these irreplaceable resources. In other cases, they have been buried out of sight. A review of existing geomorphological, archaeological, and historical information from the study area provides an understanding of the geographic factors influencing past human utilization of the project area and the preservation of its associated cultural resources, the chronology of prehistoric and historic use of the area, and the types of significant properties located therein.

Physical Characteristics

The Lower Missouri River valley between Glasgow and St. Charles, Missouri, roughly follows the border between the Dissected Till Plains of the Central Lowlands and the Salem Plateau of the Ozark Plateau (Fenneman 1938; Collier 1959). The former physiographic region formed as a result of glaciation, leaving a thick mantle of glacial debris over underlying bedrock. This glacial debris, consisting of till and loess, has been eroded to form moderately dissected and relatively smooth plains. Adjacent to the Missouri River the uplands are highly dissected by numerous intermittent and permanent streams. The Ozark Plateau to the south lies beyond the limits of glaciation; therefore, is not overlain with glacial deposits. Here relatively thin soils have developed atop limestones that frequently outcrop along drainages that dissect this region to form a very hilly terrain.

The vegetation of much of the upland areas of central Missouri is classified primarily as prairie. Oak-hickory forests dot the area and dominate the Missouri River valley from central to eastern Missouri (Kucera 1961; King *et al.* 1949).

The Lower Missouri River floodplain lies 200-400 feet below the surrounding uplands along this reach of the Missouri River (Schmudde 1963). Downstream from Glasgow, Missouri, the valley sides are steep and consist of vertical limestone and dolomite bedrock bluffs. The narrowness of the valley and its relatively consistent width between Glasgow and St. Charles, Missouri, suggests recent origin during the Pleistocene (Schmudde 1960:30). Terraces were formed by fluctuations in the river level during this period. Most of these have since been destroyed by natural and human actions such that only a few remnants of the terraces remain (Harl 1994:7).

Today much of the river is controlled by manmade levees that control seasonal flooding and have altered the natural rhythms of the river. Meandering of the river's course has produced a wide, relatively flat floodplain that, in most cases, is covered with sand, silt, and clay to a depth of over 100 feet (Harl and Naglich 1994:7; Reinhardt *et al.* 1993:7). In some places old river channels are evident as oxbows, which provide a rich natural source of riverine and shoreline fauna. Past changes in the river course have in many cases affected archeological resources in the river valley. Where the archaeological sites have not been destroyed by changes in the course of the river, they have been buried, which makes detection very difficult. This makes it imperative that natural settings containing archaeological sites (e.g., Holocene terrace remnants) be preserved.

Although few intensive investigations have focused on the limestone bluffs that define the uplands from the floodplain, it is reasonable to assume that these bluffs were utilized by early humans. Projectile points collected from the bluffs indicate that areas adjacent to the Missouri River valley were heavily utilized (C.

Chapman 1975:75-93). Natural rockshelters formed through erosion of the bluffs provided ideal campsites for hunters and gatherers.

Cultural Historical Overview

Regional evidence indicates that some of the longest and most intensive occupation of the Missouri region was from Boonville on the Missouri River in central Missouri to almost due east to the central Ohio River drainage, and south on past the mouth of the Missouri River to the state of Mississippi. The greatest clustering of sites in this area is along the Mississippi, Missouri, Ohio, and Tennessee rivers and their tributaries (Mason 1962:233). Unfortunately, a complete understanding of past human use of the Missouri River valley from St. Charles to Glasgow, Missouri, has not been obtained. This is due in part to the limited number of archaeological studies conducted in the Missouri River valley and to geomorphic considerations that affect site preservation and visibility. Few geomorphic studies have been conducted to aid in the identification of possible intact deposits. Cultural materials were likely buried below terraces formed since the end of the Pleistocene. Given the active nature of the Missouri River, many of these may have been removed or concealed. Much of our knowledge about the past human utilization of the Missouri River valley is extrapolated from information derived from archaeological investigations along tributary streams and neighboring regions.

Paleoindian Period

Paleoindian is a term used to describe early hunter and gatherers who hunted large mammals such as mammoth, mastodon, and now extinct forms of bison. This period has been dated to about 10,000-8,000 B.C. Few Paleoindian sites have been located and studied by professional archaeologists in Missouri. We must, therefore, rely upon information provided by collectors to the Archaeological Survey of Missouri. Excluding Plainview and Dalton point types, which represent the latter part of the Paleoindian period, Paleoindian points, such as Clovis and Folsom, have been most commonly reported along the main stem of the Missouri River (C. Chapman 1967, 1973, 1975). Specific sites are located on hills, terraces, and bluffs adjacent to or within a few miles of the main stream (C. Chapman 1975:60-94).

Dalton Period

The Dalton period is essentially a transitional stage between the Paleoindian and Archaic periods around 8,000-7,000 B.C. Identification of sites of this period is based primarily on the diagnostic Dalton point forms. Dalton lifeways are characterized by a shift from big game hunting to a hunting-foraging pattern. This observation is based in part on the faunal remains, which include deer, cottontail, raccoon, and squirrel, recovered from Arnold Research Cave (23CY64). This sandstone shelter is located along a ridge some 300 feet above the Missouri River (Shippee 1966). It is listed on the National Register of Historic Places. Other Dalton period sites that indicate early human utilization of eastern Missouri are Graham Cave (23MT2) (a National Register listed site 15 miles north of the Missouri River on the Loutre River), the Dalton site (23CO50) (buried in terrace fill along the Osage River near its confluence with the Missouri River and now largely destroyed), and others along the Missouri River (Klippel 1971; C. Chapman 1975:105-123, 135-136). Many of these sites are located along the Missouri River bluffs and ridges (C. Chapman 1975:107).

Archaic Period

The shift in subsistence patterns that are typical of the Dalton period are also typical of the Early Archaic period from about 7,000-5,000 B.C. Tool kits are no longer designed strictly for hunting, but now include tools necessary for more diverse subsistence, which included the harvesting and processing of seeds from native plants (C. Chapman 1975:127-157). Although the Early Archaic period is an important and dynamic period of development, little evidence supported with radiocarbon or other modern dating methods has been retrieved from this portion of the Missouri River valley. Evidence from the Dalton site, Graham Cave, and Arnold Research Cave indicates that the Dalton period in Missouri may be very similar to the Early Archaic period elsewhere (Mayer-Oakes 1951; Titterington 1950:22; C. Chapman 1975:156).

The Middle Archaic period in the central United States is associated with climatic fluctuations that resulted in an increasingly arid climate (King 1980). Adaptive cultural changes began in the Early Archaic with hunting and trapping of small animals along with collecting vegetal foods, particularly nuts and seeds. Related changes in tool kits reflect a greater diversity of subsistence activities. Among the tools included in local Middle Archaic assemblages are various large, side-notched projectile points, full-grooved stone axes, and celts (C. Chapman 1975). Evidence is also found of twined-fiber fabrics, as well as sandals, braided cordage and twisted cordage (Chapman and Chapman 1964; W. Logan 1952; A. Henning 1966). Middle Archaic sites remain small, as they were during the Early Archaic, and probably reflect a further adaptation to the prairie environment that accompanied the drier climate (C. Chapman 1975:158). Some of the more important sites containing Middle Archaic components are Graham Cave and the Hermann (23GA142) site, located along the Missouri River bluffs (Schmits 1983). 23BO964, an open-air site in the Hinkson-Perche drainage near Columbia, contains two distinct Middle Archaic components dated between 4,650 and 5,030 B.C. (Wright 1987:C-5-3). The common geographic setting of Middle Archaic sites along the Missouri River has yet to be defined.

The Late Archaic period in Missouri began approximately 3,000 B.C. and corresponds with the end of the Hypsithermal interval when the climate changed from the previously arid regime to one similar to today (C. Chapman 1975; King 1980). Wetter conditions led to an expansion of the oak-hickory woodlands and to changes in the subsistence patterns of the people who inhabited the region.

The Sedalia phase is the most prominent and widespread Late Archaic occupation in and around the study area (C. Chapman 1975:200-217; Kay 1983). This complex is recognized by a variety of distinctive tool types, including Sedalia Lanceolate and Etley Stemmed points, as well as bifacial gouges and hoes and groundstone tools. Hunting and gathering formed the economic basis of the Sedalia phase, although the earliest cultigens (bottle gourd and squash) in the region were identified in one Sedalia phase component outside the study area (Phillips Spring, 23HI216) (Chomko 1978; Kay 1983). Settlement patterns have not been clearly defined but it appears that large upland sites and smaller, seasonally occupied valley-bottom sites were the rule (similar to the Nebo Hill phase identified west of this study area) (Kay 1983; Reid 1980, 1983). Many of the Sedalia sites, including the National Register listed Geiger site (23MU91) overlooking the Missouri River valley, are "found just over the crown of the slope on high ridges" between the Osage River basin and the Missouri River valley (C. Chapman 1975:200, 203, 206-207; Kay 1983). Sedalia sites located on stream terraces are known primarily along the Pomme de Terre River, a tributary of the Osage River, in the Ozark Highlands (Kay 1983).

Woodland Period

There is little information regarding the cultural or temporal affiliation of the occupants of Missouri from about 1,000 B.C. to A.D. 1. Evidence is limited and lacking for mound building and horticulture. Early Woodland remains found to date consist of early pottery types, such as Black Sand Complex pottery. This ceramic ware is found in the northeast region of Missouri, but no radiocarbon dates have been obtained. It is assumed that the Early Woodland period in Missouri represents a continuation of the Late Archaic form of adaptation (C. Chapman 1980:15; Wright 1987:C-7-1).

The Middle Woodland period is most commonly characterized by widespread acceptance of pottery manufacture, mound building, permanent villages, and the spread of Hopewellian influences from the Illinois and Ohio river valleys. Small scale gardening of cultigens supplemented hunting and gathering.

The Monroe phase is an early Middle Woodland development centered in northeastern Missouri. This phase is defined by ceramic traits similar to those of the Illinois Valley Havana complex including cord-wrapped impressed or dentate tool marked interior rim and lip junctures, vertical dentate stamping and exterior bosses on the rim, and zoned dentate stamping on the vessel body (Donham 1982). Diagnostic projectile points of the Monroe phase include corner-notched expanding-stemmed varieties and contracting-stemmed points (Donham 1982; C. Chapman 1980:47-61). Although the majority of Monroe phase sites have been recorded in northeastern Missouri away from the Missouri River, at least one site, 23CY30, along lower Cedar Creek near

the Missouri River is known to contain a Hopewellian component related to either the Monroe phase or Central Missouri Hopewell (C. Chapman 1980:52). The Monroe phase may represent an outpost of the Hopewell culture that exploited this area for its extensive chert and animal resources. Another hypothesis is that the Monroe phase may have developed out of an indigenous culture with trade ties to Hopewell groups to the northeast (C. Chapman 1980).

Hopewell remains are also found in Central Missouri at the western end of the study area (Kay 1979, 1980). Two phases of Central Missouri Hopewell, the Big Bend and Lamine, have been identified from a network of sites near the mouth of the Grand River above Glasgow, Missouri, and a major village and smaller satellites along the lower Lamine River below Glasgow (Kay 1979, 1980). The focal site of the Lamine phase, the Mellor site (23CP1), is located on an alluvial terrace along the Missouri River at the confluence of the Lamine River, whereas the Fisher-Gabert (23SA128) and Givens (23SA1) sites are on upland slopes above the Missouri River (Kay 1980:13, 20, 22). The economy of the Central Missouri Hopewell people was based on hunting and gathering diverse resources. Chronological placement of these phases is roughly A.D. 100-400 (Kay 1979:96, 1980:25-26).

The Late Woodland period from about A.D. 500-900 saw the decline of Hopewellian influences along the Missouri River. Three cultural manifestations of this period have been defined along or near the Missouri River from Glasgow to St. Charles. From the west to the east these include the Boone phase, the Salt River phase, and the Ralls phase.

The natural boundaries of the Boone phase consist of the mouths of the Blackwater and Lamine rivers to the east and the Gasconade River in the west (Denny 1964). This phase is recognized by the presence of mound burials, simple utilitarian pottery with very limited decoration, generalized hunting and gathering with limited use of tropical cultigens, and seasonally occupied base camps. Projectile points include expanding stemmed dart points, as well as corner-notched arrowpoints, and ceramics are limestone and grit-tempered plain, cordmarked, or sometimes brushed (Denny 1964; C. Chapman 1980:112-121). It appears that Boone phase sites were seasonally located on lowland terraces and upland surfaces (especially burial mounds). Several sites located along the Missouri River bluffs contain Boone phase components and are listed on the National Register of Historic Places. Among these are Cotes Sans Dessein (23CY35), the Mealy Mounds (23CY202), and the Gay Mounds (23CO66).

The Salt River phase located east of the Boone phase exhibits strong ties with that cultural complex, but with different ceramic styles. Salt River phase ceramics are plain embossed, cordmarked and cordwrapped tool-impressed, and smoothed-over cordmarked. Projectile point styles are not well defined but commonly include large moderately expanding stemmed points and small corner-notched Scallorn and Kirk Side-Notched arrowpoints (Donham 1982).

The Ralls phase occupies roughly the same area as the earlier Salt River phase, although neither of these complexes have been clearly defined geographically. The ceramics produced during the Ralls phase are not as stylistically variable as the earlier Salt River phase ceramics with most of the rims being cordmarked and cordwrapped tool-impressed. Only a few sherds are plain surfaced or embossed. Projectile points include styles common to the Salt River phase and side-notched arrowpoints. Presently Salt River and Ralls phase sites have been identified primarily along the Salt River (Cannon Reservoir) of northeastern Missouri (Donham 1982; Wright 1987:C-9-4). Their association with the Lower Missouri River has yet to be established.

Mississippian Period

The term "Village Farmer Tradition" is used by C. Chapman (1980) to designate the generalized cultural tradition referred to as "Mississippian Tradition" by Willey (1966). This era is a time when large permanent villages were established and horticulture became an important subsistence practice. Villages were frequently established around large ceremonial centers. C. Chapman's summary of Mississippian occupation of Missouri states,

in general, there was a population concentration in the Greater St. Louis (Northeast Prairie Region) and Bootheel Riverine (Southeast Riverine Region) localities. Secondary centers were located in the Lower Missouri Valley I (Northwest Prairie Region) and Mississippi Valley Central (Southeast Riverine Region) Localities (C. Chapman 1980:227).

Mississippian materials appear to be lacking in the northeast region north of the Missouri River. Wright (1987:C-10-1 to C-10-8) explains this by indicating that the Boone phase, currently associated with the Late Woodland period, either retained its cultural identity despite Mississippian influences or traits of the Boone phase masked any Mississippian traits. A similar explanation for this lack of Mississippian occupation is offered by C. Chapman (1980:152), who believes that the Mississippian culture had little influence on the groups that occupied the areas north of the Missouri River such that they continued a way of life associated with the Late Woodland period. Regardless, few Early Mississippian sites have been identified in the area from Glasgow to St. Charles especially north of the Missouri River.

The cultural changes that distinguish later Mississippian developments from the Early Mississippian include an accelerated growth of population, a broadening of relationships between civic-ceremonial centers, and an expansion of territory under civic-ceremonial-center control. Essentially the culture expanded and became more complex. Mounds and fortifications were expanded as new territory was colonized. Arts and crafts reached new heights, public buildings were larger, and towns were better planned and organized (C. Chapman 1980:228). Despite this growth few sites in the area along the Missouri River from Glasgow to St. Charles have been recorded.

Historic Period

The first Europeans to report the existence of the Missouri River from observation of its confluence with the Mississippi River were Father Marquette and Louis Jolliet in A.D. 1673. Despite the early discovery of the Missouri River, little is known of the Indians that may have inhabited the lower portion of the Missouri River during Protohistoric and Early Historic times. A number of fur traders and explorers, including de Bourgmont, travelled through the area leaving few records of their observations and activities. No doubt de Bourgmont and others had contact with any Indians living or travelling along this stretch of the Missouri River, but written reports of early contacts are missing.

The major means of transportation during the period of early Euroamerican use of the area was by water making the Missouri and Mississippi rivers favored routes of travel (Foley 1989:94; Crampton 1983:43). The first boats used by the residents were birch bark canoes or the sturdier pirogue. Larger cargoes necessitated the use of the bateau, which was later replaced by the more maneuverable and streamlined keelboat. Swollen streams, rampaging waters, floating debris, and underwater obstructions were just some of the hazards of travel that sank many of these boats (Foley 1989:94).

Despite early Euroamerican travel along the lower Missouri River, non-native settlements were not established along its banks until after the beginning of St. Louis in about A.D. 1764, just prior to Spanish takeover of the region. In A.D. 1801 Louisiana was transferred by the Spanish back to the French causing concern in the United States and starting diplomatic negotiations, which ended in the Louisiana Purchase of 1803. This put modern-day Missouri under the control of the United States. This, combined with the knowledge gained of the western regions by the Lewis and Clark expedition (Moulton 1986), led to increased settlement west of the Mississippi. By A.D. 1814 the Euroamerican population of the region was an estimated 25,000 and by A.D. 1820, 66,000 (Ronnebaum 1936). Many of the early settlers arriving after about A.D. 1820 were from the southern states. By the mid 1800s a large percentage of the immigrant population was German (Parrish *et al.* 1980:150-151).

While Missouri Territory was a land of promise for Europeans and Americans it was quite different for the Native Americans. By A.D. 1816 there were nearly 5,000 Indians living within the confines of present-day

Missouri. They lived in scattered localities throughout the territory and in treaty-defined reserves. Of concern here are the Delaware, whose main camp of 840 people was near Cape Girardeau, with a few scattered camps near St. Louis (although Governor William Clark's report does not provide specific locations around St. Louis) (Clark 1816; Foley 1989:247).

Missouri became a state in A.D. 1821. The capital was first located in Cote sans Dessein in Callaway County and later moved to the City of Jefferson (Jefferson City) (Parrish et al. 1980:56-57). (Cote Sans Dessein, recorded as site 23CY35, is listed on the National Register of Historic Places due to its historical significance, as well as its significant prehistoric remains.)

The first steamboat to attempt to ascend the Missouri River was the *Independence* in A.D. 1819. Although this first trip was short, by A.D. 1840 over 260 steamboats had passed Jefferson City and extended their operations to Glasgow, Missouri, and beyond, as far as Fort Benton on the upper Missouri some 2,200 miles from St. Louis. Jefferson Landing, one important steamboat landing along this reach of the Missouri River, is now marked as a State Historic Site below the modern state capitol building in Jefferson City, Missouri.

Steamboat travel was not without its hazards as is readily apparent from the number of boats that sank or were otherwise permanently damaged along the Missouri River. At least 95 steamboats wrecks along this stretch of the Missouri River were report by Captain Chittenden in his 1897 report to the Corp of Engineers and Secretary of the Missouri River Commission. Of this number only 9 were known to have been raised (Chittenden 1897; McDonald 1926; Cooley and Fuller 1976). The exact location of most of the wrecks is unknown. Remains of the *Montana* (23SL390), which went down June 22, 1884, near St. Charles, are still visible during low water (Reinhardt et al. 1993:33-34; personal communication, Camille M. Lechliter to Joseph Harl, January 11, 1994).

In A.D. 1836 a state convention strongly endorsed the building of two railroad lines across the state. One was to run parallel to the Missouri River while the other was to serve the mining areas southwest of St. Louis. The panic of 1837 assured that neither would be built. Interest was revived in A.D. 1847 with a line between St. Joseph and Hannibal, but it was not until A.D. 1851 that a railroad line was started linking St. Louis with Kansas City. By the outbreak of the Civil War this line had only reached Sedalia. Other railroad ventures in the 1850's included a line between St. Charles and the Iowa border and another from St. Louis southwest to Pilot Knob (Parrish et al. 1980:161-165; Million 1896; Gates 1932).

The geographical distribution of slaves in Missouri prior to the Civil War would seem to be closely tied to the available transportation networks supplied by the steamboats and the railroads. The slave population had risen from 10,222 in A.D. 1820 to 114,931 by A.D. 1860. The majority of this population was in central Missouri along the Missouri River from Callaway County west to the Kansas border. The study of early settlements in Missouri should be aware of the archaeological record left by the slave population and the impact that the transportation systems had upon the slavery issue (Parrish et al. 1980:103-125; Trexler 1914; Greene et al. 1980). Because of the state's standing as a slave state, Civil War skirmishes did erupt. No major battles occurred along the Missouri River between Glasgow and St. Charles.

After the Civil War, Missouri concentrated on economic development with railroads being the focus of this growth. In A.D. 1867 construction of a bridge over the Mississippi River at St. Louis was begun. This spurred the growth of railroads throughout the state and included lines on each side of the Missouri River from St. Charles to Boonville. Bridges were constructed at St. Charles, Boonville, and Glasgow. By A.D. 1918 a network of railroads reached all but three Missouri counties in the Ozark mountains (Million 1896). Roads also improved during the latter portion of the nineteenth and into the twentieth centuries such that no fewer than eight major bridges have been constructed over the Missouri River between Glasgow and St. Charles, Missouri. These transportation facilities support the economy of the Missouri River valley between the latter two cities.

Small scale industries developed in the area over the decades. Among these was the salt manufacturing

business of Daniel M. and Nathan Boone south of Glasgow, Missouri, and the German wineries of Hermann, Missouri. The site of the former operation is now preserved at the Boon's Lick State Historic Site. Across the Missouri River is the Arrow Rock State Historic Site, which preserves a mid-nineteenth century village of central Missouri. The Historic District of Hermann also preserves the history of an early (A.D. 1837-present) Missouri River town. For much of the surrounding river valley farming has been the mainstay of the economy and continues so today.

C. The Missouri River from St. Charles, Missouri, downstream to its confluence with the Mississippi River at St. Louis, Missouri by Lauren W. Ritterbush and Orval E. Shinn

Past human settlement was strongly influenced by geographic and geomorphic factors. As a rich environmental zone in the prairie-plains of central North America, the Missouri River valley was a favored area of resource exploitation for native and immigrant populations. Certain factors, such as flooding and drainage, may have made occupation of the base floodplain precarious and unpleasant at times. Nonetheless, more suitable terrace or upland surfaces in and adjacent to the valley were preferred habitats for prehistoric and historic populations. This is shown in the archaeological and historic record of the Missouri River region. This record is as yet incomplete, since archaeological and historical studies of the immediate surroundings of the River have been limited. Add to this the effects of natural and cultural processes on archaeological and historical remains. Many of these processes have damaged or destroyed these irreplaceable resources. In other cases, they have been buried out of sight. A review of existing geomorphological, archaeological, and historical information from the study area provides an understanding of the geographic factors influencing past human utilization of the project area and the preservation of its associated cultural resources, the chronology of prehistoric and historic use of the area, and the types of significant properties located therein.

Physical Characteristics

The lowest reach of the Missouri River from St. Charles to near St. Louis, Missouri, is at the southeastern edge of the Dissected Till Plains of the Central Lowlands (Fenneman 1938; Collier 1959). This region consists of moderately dissected plains covered with glacial till and loess. Since much of this study area, especially north of the Missouri River between St. Charles and St. Louis, consists of floodplain, its topography is generally flat. Dissected uplands characterize the south or right side of this reach of the Missouri River. Vegetation in the area consists of oak-hickory forest (Kucera 1961; King *et al.* 1949).

For much of the Lower Missouri River valley the floodplain is 100 feet or more below the surrounding upland heights (Schmudde 1960). Above St. Charles, Missouri, the valley sides are steep and consist of nearly vertical limestone and dolomite bedrock bluffs that form a relatively narrow trench through which the Missouri River flows (Schmudde 1960, 1963). At St. Charles this trench opens to the broad floodplain shared by the Missouri and Mississippi rivers between that city and the confluence of the former with the latter river near St. Louis, Missouri.

Little geomorphic study has been conducted of the St. Charles to St. Louis Missouri River valley (e.g., Goodfield 1965). This is likely due in large part to urban development of this area and the complexity of geomorphic forces acting on the shared valleys of the Missouri and Mississippi rivers. Terrace remnants likely exist within the valley, although Harl notes that,

The lower end of the Missouri River is particularly active and the river has meandered across the bottoms from one bluff base to the other. This wandering resulted in a wide, relatively flat floodplain. A number of meander scars occur on these bottoms. Occasionally, these scars are filled with water and form a natural lake that are [sic] a rich source of riverine and shoreline flora and fauna. Flooding leaves considerable quantities of sands, silts, and clays on these bottoms. ... Many of the archaeological sites located within this dynamic area have probably been destroyed or are deeply buried (Harl 1994:7; cf. Harl and Naglich 1994; Reinhardt, Naglich, and Harl 1993:7).

Careful investigation of active floodplains such as this is required to define possible areas of intact prehistoric deposits. These may exist as terrace remnants in areas not affected by stream migration or isolated unworked remnants of floodplain left by meander cutoffs (Schmudde 1960). An example of buried cultural material within a recent meander is 23SL68, a buried Middle Woodland (Hopewell) site located near St. Charles (Nixon *et al.* 1983).

Near the upper or western end of this study area is one known prominent terrace called the Bonfils

Terrace. This is a rock-defended (strath) terrace composed of sand, sandy silt, clay, and cobbles deposited along the Missouri River starting about 16,000 B.C. (William and Tyre 1958; Goodfield 1965; Reinhardt, Naglich, and Harl 1993:7). The terrace surface is approximately 40 feet above the floodplain and likely formed a surface suitable for human occupation at some time or times in the past. Remnants of other relatively stable surfaces may exist elsewhere in the valley and should be the focus of concerted geomorphic and archaeological investigation. Future geomorphic research of the study area should correlate findings of the lowest portion of the Missouri River valley with those resultant from recent investigations in the Mississippi River valley, especially in the American Bottom.

Cultural Historical Overview

Regional evidence indicates that some of the longest and most intensive occupation of the Missouri region was along the lower portion of the Missouri River (Mason 1962:233). Unfortunately, a complete understanding of past human use of the Missouri River valley from St. Charles to the confluence of the Missouri River near St. Louis has not been obtained. This is due in part to the limited number of archaeological studies conducted in the Missouri River valley, extensive damage to archaeological resources in this study area due to urban expansion, and to geomorphic considerations that affect site preservation and visibility. As noted above few geomorphic studies have been conducted to aid in the identification of possible intact deposits. Cultural materials were likely buried below terraces formed since the end of the Pleistocene. Given the active nature of the Missouri River, especially along this stretch of the river, many of these may have been removed or concealed. Much of our knowledge about the past human utilization of this region is extrapolated from information derived from archaeological investigations outside the immediate study area. Additional information on the prehistoric culture history of the St. Louis area can be obtained from Benchley (1976).

Paleoindian Period

Paleoindian is a term used to describe early hunter and gatherers who hunted large mammals such as mammoth, mastodon, and now extinct forms of bison. Few Paleoindian sites have been located and studied by professional archaeologists in Missouri. Nonetheless, more than 67 fluted points have been reported from St. Charles and St. Louis counties, Missouri, indicating the presence of Paleoindian hunters near the mouth of the Missouri River as early as 10,000-8,000 B.C. (C. Chapman 1975:67). This is supported by finds of fluted points estimated to date between 10,000 and 9,000 B.C. found in association with mastodon bones at the Kimmswick site (23JE334) south of the study area in Mastodon State Park (Graham 1980; Graham *et al.* 1981:1115-1117). This site is listed on the National Register of Historic Places.

Dalton Period

The Dalton period is essentially a transitional period from about 8,000-7,000 B.C. between the Paleoindian and Archaic periods. Dalton lifeways are characterized by a shift from big game hunting to a hunting-foraging pattern. Identification of sites of this period is based primarily on diagnostic Dalton points, which are relatively common surface find in Missouri, generally in upland areas along major stream valleys, as well as along terraces and floodplains (C. Chapman 1975:107; Wright 1987:B-6-1). Little is known of Dalton remains in the study area.

Archaic Period

The shift in subsistence patterns that are typical of the Dalton period are also typical in the Early Archaic period (7,000-5,000 B.C.). Tool kits are no longer designed strictly for hunting, but now include the tools necessary for a more diverse subsistence pattern, which included the harvesting and processing of seeds from native plants (C. Chapman 1975:127-157). Although the Early Archaic period is an important and dynamic period of development, little evidence for it has been found in this portion of the Missouri River valley.

The Middle Archaic period (5,000-3,000 B.C.) in the central United States began with climatic

fluctuations that resulted in increasingly arid climate and ended when this drier period was at its peak (King 1980). Adaptive cultural changes began in the Early Archaic, with hunting and trapping of small animals along with collecting vegetal foods, particularly nuts and seeds. As a result the tool kits changed to reflect greater diversity of activities. These tools include large side-notched projectile points, full-grooved axes, and celts (C. Chapman 1975; Chapman and Chapman 1964; W. Logan 1952). Although little evidence of this period has been found in this study area, its common appearance in the nearby Lower Illinois River valley suggests that the Lower Missouri River valley was equally important to Middle Archaic populations adjusting to the warm, dry climate of this period (Asch *et al.* 1972).

The Late Archaic period in Missouri began approximately 3,000 B.C., corresponding with the end of the Hypsithermal interval, and continued in this region until about 600 B.C (or possibly as late as 150 B.C.). The climate changed from the previously arid regime to one that was similar to today (C. Chapman 1975; King 1980). Wetter conditions led to an expansion of the oak-hickory woodlands and to changes in human subsistence patterns.

The Sedalia phase is a widespread Late Archaic complex of east-central Missouri just west of this study area. Settlement patterns of this phase appear to include the use of large upland sites and smaller, seasonally occupied valley-bottom sites (Reid 1980; Kay 1983; Wright 1987:C-6-5). More appropriate for this lowest stretch of the Missouri River is probably the temporal-cultural sequence of the nearby American Bottom of the Mississippi River valley of Illinois (Harl and Nixon 1992; McElrath *et al.* 1984). Extensive archaeological investigations in the American Bottom indicate that a more sedentary lifestyle developed during the Late Archaic period. Subsistence continued to be based on broad spectrum hunting and gathering, perhaps supplemented by early horticulture (McElrath *et al.* 1984; Kay 1980; Chomko 1978). Primary settlements appear to be located on high terraces below bluff slopes or near old river meanders, and campsites away from these villages in the valleys and uplands (Emerson 1984; Emerson and McElrath 1983; Fortier 1984).

Woodland Period

There is little information regarding the Early Woodland occupation of the study area. It appears that Late Archaic settlement and subsistence patterns of the region continue into the Early Woodland period from about 600-150 B.C. with population increase and continued dependence on river valley resources (Harl 1994; Benchley 1976:33; C. Chapman 1980:15). Late Archaic tool kits continue to be used with the addition of Black Sand pottery and various contracting stemmed point styles, including Burkett, Adena, Gary, and Kramer (C. Chapman 1980).

Pottery is more widespread during the Middle Woodland period (150 B.C.-A.D. 300) and is found in association with large-scale moundbuilding, semi-permanent villages, incipient horticulture, and Hopewellian traits. The latter were likely derived through contact with Hopewell populations along the nearby Illinois River. Various types of sites were likely used by these Middle Woodland populations, including possible redistributions centers along major trade routes (e.g., adjacent to major rivers near the confluence of tributary streams) (Kay 1979, 1980). Middle Woodland sites (including major villages) have been recorded in and near the study area (Nixon *et al.* 1984; Harl 1994; Harl *et al.* 1986, 1989).

The Late Woodland period along the Missouri River trench is characterized by the decline of Hopewellian influences, smaller scale moundbuilding, and changes in ceramic technology. The Late Woodland manifestation centered near the metropolitan centers of St. Louis, St. Charles, and nearby areas is known as the Jersey Bluff or Patrick phase, dated to about A.D. 300-800. Its ceramic traits include shell and limestone tempering, cordmarked exteriors, and limited decoration, including interior lip impressions. Red slip vessels also appear during this phase and continue into the Mississippian period. Diagnostic projectile points include corner-notched arrowpoints and expanded stemmed points. Settlements were located both on uplands and bottomlands of the lower Missouri River valley. Houses were semi-subterranean and rectangular with sleeping spaces and interior storage pits. Stone platform charnel houses are also associated with this phase. Hunting and gathering continued to be the primary form of subsistence with greater reliance placed on gardening of native cultigens

(Benchley 1976:34-35; C. Chapman 1980:130-132; Harl 1991, 1994:24-25; Shippee 1956).

Mississippian Period

The Mississippian period (A.D. 800-1,400) of the Lower Missouri and nearby Mississippi River valleys is characterized by large permanent villages, ceremonial centers, a dependence on corn horticulture, and wide-range trade networks. During the early part of this period from about A.D. 800-1000 (Emergent Mississippian) the transition from Late Woodland adaptations to Mississippian lifestyles was made. Ceramics associated with this early period continued traits of the previous period with cord-marked conical vessels with plain rims (Harl 1991:170-171, 265-266; 1994). Changes are evident in the angled or everted lips; lip effigies, lugs, and handles; and the manufacture of perforated pottery discs and figurines. Small stemmed points made from flakes and stone hoes and spades also occur. Settlements include villages on terraces of major streams and resource extraction camps elsewhere in the region.

Further development of these traits continued into the latter part of the Mississippian period from about A.D. 1,000-1,400. This period saw the climax of Mississippian development in the region with large civic and ceremonial centers, such as Cahokia, forming the pinnacle of a hierarchy of villages and farming hamlets (Fowler 1978; Harl 1991:213-214; 1994:26). Due to the importance of gardening and trade, most of the villages and hamlets were located along major stream valleys, for instance on terraces near the river and fertile bottomlands. Ceramics tend to be shell-tempered and plain, cordmarked, and/or decorated, while projectile points were commonly triangular unnotched or side or basal notched.

Little evidence for Mississippian occupation of the St. Charles area has been recorded; however, the St. Louis area is rich in Mississippian remains. At least one large Mississippian center existed on the site of present-day St. Louis. The destruction of as many as twenty-seven mounds was accomplished in A.D. 1869, when they were removed for fill for the North Missouri Railroad (Peale 1862; E. Chapman 1949; Williams and Goggin 1956). This destruction makes it impossible to interpret these and other destroyed remains, but they were likely related or similar to Cahokia, a large ceremonial complex still preserved in Illinois opposite the mouth of the Missouri River (Fowler 1974, 1989).

Among the sites recorded in St. Louis County, Missouri, that were likely affiliated with Cahokia is Sioux Passage Park Archaeological Site (23SL35B), listed on the National Register of Historic Places. According to C. Chapman (1980:171) this site has been assigned to the Fairmount phase, one of three Early Mississippian phases identified at Cahokia. Other Fairmount phase sites recorded in the county provide additional information about this phase (Blake 1947, 1955). Assemblages associated with this Early Mississippian manifestation include large open-mouthed jars used for cooking. Ceramics were generally shell or grog tempered with a red slip (Fowler and Hall 1972:5-6). Houses commonly were rectangular and occasionally semi-subterranean with the larger ones measuring about 40 by 60 feet.

At least two sites in the study area have been attributed to the following Stirling phase (C. Chapman 1980; Mills 1949; Meyer 1955). Ceramics from these sites include Powell Plain, Ramey Incised, Tippett's Bean Pot without decoration, bird-effigy bowls, and Cahokia Stump ware. These are consistent with the wares described by Fowler and Hall (1972) for the Stirling phase at Cahokia (C. Chapman 1980:171-172).

The final Moorehead phase appears to represent a continuation of earlier cultural developments. Shell-tempered, cord-marked pottery replaced the earlier grit-tempered and grog-tempered wares. Tippett's Bean Pot and an early form of Wells Incised appeared along with a local equivalent of Mound Place Incised (Phillips *et al.* 1951). Although no sites of this phase have been investigated in Missouri it is almost certain that many of the destroyed St. Louis mounds were occupied during this phase of the Mississippian Period (C. Chapman 1980:173). (Wright [1987:B-6-7] lists the Sioux Passage Park Archaeological Site mentioned above as a Moorehead, rather than a Fairmount, phase site.)

Protohistoric Period

The Protohistoric Period is that period prior to direct contact between Euroamericans and Native Americans in the study area. The beginning of this period is probably around A.D. 1300 or 1400 when Mississippian towns and villages were abandoned or diminished in size and importance. Related to this Mississippian decline was decreased trade and ceremonial activities. Native adaptations became similar to those of the Late Woodland period, including relatively small settlements in a variety of locations, including away from the major stream valleys, and increased importance (at least locally) placed on hunting and gathering rather than corn horticulture (Harl 1994; Moffat 1985; Woods 1986). No Protohistoric sites are known in the study area (Harl 1994:27).

Historic Period

The first European report of the existence of the Missouri River confluence with the Mississippi River was made in A.D. 1673 by Father Marquette and Louis Jolliet, who penned the word "Missouri." This word was a French rendition of an Algonquian term best translated as "those who have big canoes." The Indian name for this river was Pekitanoui or "the river of muddy waters" (Foley 1989:1).

Traders and explorers followed these first travellers and by A.D. 1764, just prior to the Spanish takeover of the region, the settlement of St. Louis had been established. Few of the early traders appear to have settled on the western shore of the Mississippi River in this area, but on the east bank south of St. Louis were established the towns of Cahokia, St. Philips, Prairie du Rocher, Fort de Chartres, and Kaskaskia. The earliest permanent and only west bank settlement prior to St. Louis was Ste. Genevieve, which was begun by the French in A.D. 1735, near the mouth of the La Saline River south of the study area (Foley 1989:1-50; Crampton 1983:43). After the establishment of St. Louis a number of other communities developed in the region, including St. Charles. This settlement started in about A.D. 1769 as a trading post run by French fur trader Louis Blanchette and called "Les Petites Cotes" (Parrish et al. 1980:30; Houck 1908). By A.D. 1804 this community had 450 inhabitants.

The major means of transportation between these and other communities was by foot or by water. Few roads existed and these were either in bad shape or were nothing more than wilderness trails. This made the Missouri and Mississippi rivers favored routes (Foley 1989:94; Crampton 1983:43). The first boats used by the residents were birch bark canoes or the sturdier pirogue. Larger cargoes necessitated the use of the bateau, which was later replaced by the more maneuverable and streamlined keelboat. Swollen streams, rampaging waters, floating debris, and underwater obstructions were just some of the hazards of travel that sank many of these boats (Foley 1989:94).

In A.D. 1801 Louisiana was secretly transferred by the Spanish back to the French. This caused concern in the United States and started diplomatic negotiations that ended in the Louisiana purchase of A.D. 1803 and brought Missouri under the control of the United States. This, combined with the knowledge gained of the western regions by the Lewis and Clark expedition, led to increased settlement west of the Mississippi. By A.D. 1814 the population of the Missouri region had increased to an estimated 25,000 and by A.D. 1820 it had grown to 65,000 (Ronnebaum 1936). As the "Gateway to the West," St. Louis and St. Charles became the primary outfitting and jumping-off points for early explorers, traders, and immigrants to the western lands. St. Louis also became known as the primary center of trade operations for the entire stretch of the Missouri River, influenced heavily by the resident Chouteau family (Foley and Rice 1983). For protection of American activities in these newly obtained lands, Fort Bellefontaine was established by the United States government in A.D. 1805 on a bluff overlooking the Missouri River. It was moved in A.D. 1826 to the south along the Mississippi River and named Jefferson Barracks (Primm 1981).

Little is known of the native populations of the lowest portion of the Missouri River at the time they were first encountered by the Euroamericans. Like the Euroamerican immigrants, eastern tribes also passed through the area. Those to settle in the region were the Delaware, whose main camp of 840 people was near Cape Girardeau, with a few scattered camps near St. Louis (although Governor William Clark's 1816 report does not mention specific locations around St. Louis) (Clark 1816; Foley 1989:247).

In A.D. 1817 petitions that would result in statehood for Missouri began circulating through the territory. By August 10, 1821, with the conclusion of numerous debates and the famous Missouri Compromise, Missouri became a proslave state. The first General Assembly convened on September 18, 1821, at the Missouri Hotel in St. Louis. St. Charles was selected as the temporary capital for the new state. It was later moved to Cote sans Dessein in Callaway County, and finally permanently located in Jefferson City (Parrish et al. 1980:56-57). The early history of St. Charles and Missouri's first state capital are recognized in the St. Charles Historic District and the First State Capitol State Historic Site.

The year A.D. 1817 not only marked the first petitions for statehood but also the year that the first steamboat, the *Zebulon M. Pike*, landed at St. Louis. The first steamboat to ascend the Missouri River was the *Independence* in A.D. 1819. By the early 1830s more than 500 steamboats docked at St. Louis annually with that number quadrupling during the following decade. By 1850 that number had again doubled (Parrish et al. 1980). The Missouri River traffic was also heavy and by A.D. 1840 over 260 steamboats had passed Jefferson City and extended their operations far beyond to western ports.

Steamboat travel was not without its hazards as is readily apparent from the number of boats that sank or were otherwise permanently damaged along the Missouri River. At least 19 steamboats sank along this stretch of the Missouri River by the time of Captain Chittenden's 1897 report to the Corp of Engineers and the Secretary of the Missouri River Commission. Of this number only 1 is known to have been raised (Chittenden 1897; McDonald 1926; Cooley and Fuller 1976). The exact location of most of the wrecks is unknown. Remains of the *Montana* (23SL390), which went down June 22, 1884, near St. Charles, are still visible during low water (Reinhardt et al. 1993:33-34; personal communication, Camille M. Lechlitter to Joseph Harl, January 11, 1994).

In A.D. 1836 a state convention strongly endorsed the building of two railroad lines across the state. One was to run parallel to the Missouri River while the other was to serve the mining areas southwest of St. Louis. The panic of A.D. 1837 assured that neither would be built. Interest again was revived in A.D. 1847 with a line between St. Joseph and Hannibal, but it was A.D. 1851 before a railroad line between St. Louis and Kansas City was started. Other railroad ventures in the 1850's included a line between St. Charles and the Iowa border and another from St. Louis southwest to Pilot Knob (Parrish et al. 1980:161-165; Million 1896; Gates 1932).

At the outbreak of the Civil War in A.D. 1861 protecting the strategic St. Louis Arsenal just south of the city was of primary importance to the Union military. This kept the local conflicts near the Mississippi, not the Missouri, River. When the Missouri militia established Camp Jackson near the Arsenal in May 1861 and aligned themselves with the Confederacy, Union troops surrounded the camp and received its surrender (Parrish 1973; Primm 1981; Castel 1968).

After the Civil War, Missouri concentrated on economic growth with railroads as a primary focus of that growth. In A.D. 1867 construction of a bridge over the Mississippi River at St. Louis was begun, increasing access to the western frontier. The growth of the railroads spurred by this and other bridges over the Missouri and Mississippi rivers at St. Charles and St. Louis allowed the railroads to create a network that reached all but three counties in Missouri by A.D. 1918 (Million 1896; Primm 1981). St. Charles became an important regional railroad interchange due its bridge, and at least one railroad was built across the Missouri River floodplain to St. Charles from the northeast.

Other areas of the economy were also growing and by A.D. 1870 St. Louis became a major manufacturing center producing iron, flour, beer, clothing and furniture. In the years after A.D. 1870 this region continued to add to its industrial base with the manufacture of chemicals, medicines, paving bricks, sewer pipes, white lead, shoes, street cars, and tobacco products. Most of this growth was in St. Louis near the Mississippi, not the Missouri, River. From A.D. 1860 to 1890 St. Louis' economic value increase from \$20 million dollars to over \$228 million dollars (Parrish 1980:229-230).

D. The Kansas River from Milford Lake, Kansas, to its confluence with the Missouri River by Lauren W. Ritterbush

Past human settlement was strongly influenced by geographic and geomorphic factors. As a rich environmental zone in the prairie-plains of central North America, the Kansas River valley was a favored area of resource exploitation for native and immigrant populations. Certain factors, such as flooding and drainage, may have made occupation of the base floodplain precarious and unpleasant at times. Nonetheless, more suitable terrace or upland surfaces in and adjacent to the valley were preferred habitats for prehistoric and historic populations. This is shown in the archaeological and historic record of the Kansas River region. This record is as yet incomplete, since archaeological and historical studies of the immediate surroundings of the River have been limited. Add to this the effects of natural and cultural processes on archaeological and historical remains. Many of these processes have damaged or destroyed these irreplaceable resources. In other cases, they have been buried out of sight. A review of existing geomorphological, archaeological, and historical information from the study area provides an understanding of the geographic factors influencing past human utilization of the study area and the preservation of its associated cultural resources, the chronology of prehistoric and historic use of the area, and the types of significant properties located therein.

Physical Characteristics

The Kansas River stretches from the confluence of the Smoky Hill and Republican rivers (below Milford Dam) near Junction City, Kansas, to its confluence with the Missouri River at Kansas City, Kansas-Missouri (Schoewe 1951:276-285). This eastward flowing stream crosses the northern portion of the Flint Hills Uplands and the southern edge of the Glaciated Region or Dissected Till Plains of northeastern Kansas near its boundary with the Osage Cuestas (Fenneman 1938). The bedrock of these physiographic regions consists of Upper Pennsylvanian and Permian (chert-bearing) limestones and shales. In the Glaciated region this bedrock is covered by dissected glacial till, outwash, and loess. Adjacent to the Kansas River, this area is referred to as the Attenuated Drift Border since the topography here is rougher than the remainder of the Glaciated Region and has only patches of glacial deposits (Schoewe 1949).

The natural vegetation of the Kansas River region grades west to east from tallgrass (bluestem) prairie to oak-hickory mosaic in this region of subhumid, continental climate. The vegetation of the Kansas River bottomlands is primarily riparian, with forests, including cottonwood, hackberry, and willow, and wetlands, including prairie cordgrass, smartweeds, docks, and chenopods (Sorenson *et al.* 1987:93; Johnson and Logan 1990:268-269).

The Kansas River valley is composed largely of Pleistocene and Holocene alluvium. A sequence of four terraces has been identified from oldest to youngest in the lower Kansas River valley. These are the Menoken terrace, Buck Creek terrace, Newman terrace, and Holliday terrace complex (also referred to as the "intermediate surface complex" by Dufford [1958]) (Sorenson *et al.* 1987:94; Dort 1987; Johnson and Logan 1990:275). The oldest terrace identified in the Kansas River valley, the Menoken terrace, was formed during the retreat of the Kansan ice sheet. Its composition has been variously described but appears to include several types of glacial deposits rather than alluvium. The surface of this terrace lies up to 33 m above the present floodplain and has been mapped primarily as small erosional remnants between Bonner Springs and Wamego, Kansas (Sorenson *et al.* 1987:94; Dort 1987:103-104; Johnson and Logan 1990:275).

The next lowest terrace surface, about 12 m above the modern floodplain, is of the Buck Creek terrace. The fill of this terrace is composed of alluvium covered by loess. The loess is identified as Loveland and/or Peoria Loess (Carlson 1952). Subsurface deposits suggest a minimum age of Illinoian or Yarmouthian (Sorenson *et al.* 1987:94; Johnson and Logan 1990:275). Scattered remnants of the Buck Creek terrace have been mapped along the Kansas River, except in the extreme lower reaches of the valley between Eudora and Kansas City, Kansas. These remnants are concentrated primarily near the mouths of tributary streams (Fader 1974; Holien 1982; Sorenson *et al.* 1987:94; Dort 1987:104; Johnson and Logan 1990:275).

A larger proportion of the Kansas River valley is occupied by the Newman Terrace, which also extends up major tributary valleys (e.g., Mandel 1994). The surface of this terrace is low relative to the two older terraces at about 3 m above the present floodplain and is occasionally inundated during severe floods. It is generally flat with few surface features except low natural levees and can be poorly drained (O'Conner 1960). Paleosols in the alluvial fill have been dated to 10,430±130 B.P. (8,480±130 B.C.), 8,940±90 B.P. (6,990±90 B.C.), and 4,950±120 B.P. (3,000±120 B.C.) (Holien 1982; W. Johnson 1987), indicating that it formed no later than about 5,000 years ago through downcutting and aggradation during the late Wisconsin and early Holocene (Sorenson *et al.* 1987:96; Dort 1987:104-105; Johnson and Logan 1990:275-276).

Rising 1-2 m about the present floodplain is the Holliday terrace complex. This terrace complex is often separated from the floodplain by a low natural levee (McCrae 1954) and is characterized by numerous meander scars and abandoned channels. Fill of the Holliday terrace complex has been dated between 2,340 B.C. and A.D. 740 (W. Johnson 1987:42; Sorenson *et al.* 1987:96). This terrace complex is prevalent in the Kansas River valley and in major tributary valleys (Johnson and Logan 1990:276).

The lowest portion of the Kansas River valley, which is relatively narrow, is dominated by the modern floodplain. This surface is relatively flat with subtle relief produced by channel scars, generally parallel to the present channel. The floodplain is relatively young, probably less than 1,200 years old (Sorenson *et al.* 1987:96; Johnson and Logan 1990:277).

Each of the above-described terraces would have provided occupational surfaces for humans at some time during the past. The fill underlying the oldest terraces, Menoken and Buck Creek, was deposited prior to human use of the area. Cultural remains are not expected to be buried within the fill. Rather, they should be found in association with the terrace surface and might include remains from all known ages of human occupation of the region. The fill below the Newman terrace and Holliday terrace complex, on the other hand, dates to periods of Paleoindian and Archaic occupation and Archaic, Woodland, and Plains Village/Mississippian occupation, respectively. Paleosols below these terraces indicate repeated landform stability attractive for long-term human occupation. Younger materials have been found atop the Newman terrace also indicating stability (Johnson and Logan 1987:277, 290). Continuing deposition on the Holliday terrace complex has buried more recent remains on that surface, although Woodland and/or Plains Village materials have been found on this surface (e.g., 14WY16, 14WY17; B. Logan 1987a:34). The present floodplain may contain relatively recent cultural remains, probably Plains Village/Mississippian, Protohistoric, and Historic, although present information indicates that they are not abundant and/or buried by recent alluvium (Johnson and Logan 1990:277, 290).

Compilation and comparison of geomorphic data from the Kansas River valley, as well as from its tributaries, has revealed six major periods of soil formation in the Kansas River basin (Johnson and Logan 1990:279-281). These are associated with periods of human occupation of the region. The oldest identified period of soil formation is dated to about 8,550 B.C. or during the Paleoindian period. Late Clovis, Folsom, and/or Plano or Dalton materials can be expected with this soil. Later Archaic remains may be associated with widespread soil formation about 3,050 B.C. following a hiatus, possibly associated with the Altithermal/Hypsithermal climatic regime. Less well documented soil formation processes at about 2,250 and 650 B.C. correlate with Late Archaic occupation of the region. The transition between the Archaic and Woodland periods may be evident from remains associated with widespread soil development around 50 B.C. More recent paleosols dating to about A.D. 750 appear at the end of the Woodland period.

Cultural Historical Overview

The cultural chronology of the Kansas River valley extends from Paleoindian times about 10,000 B.C. up to the present. Evidence for this is briefly reviewed in Witty's (1979) preliminary literature search of the Kansas River proper and a similar review by O'Brien (1980) for the upper reaches of the Kansas River drainage. A paleontological literature search of known Pleistocene fossil localities along the Kansas River valley also has been completed (Martin *et al.* 1979). At least one archaeological survey has focused on specific localities along

the Kansas and Smoky Hill rivers (Sturdevant 1980).

Despite these studies, a thorough understanding of past human use of the valley has not been obtained. This is due in part to geomorphic considerations that affect site preservation and visibility. As noted earlier, prehistoric cultural deposits are likely buried below the Newman terrace and Holliday terrace complex. Lateral stream migration (e.g., Dort *et al.* n.d.) has destroyed many sites through removal of the deposits in which they were buried. Continued alluviation has concealed others except along cutbanks and other exposures.

Given these factors, it is necessary to extract information about past human use of the Kansas River valley from that obtained from the larger region. Much of this information comes from archaeological surveys and excavations along tributary streams. Among those that have received prior archaeological attention are Wolf Creek, Mill Creek, Stranger Creek, the Wakarusa River, the Delaware River, the Big Blue River, the Republican River, and the Smoky Hill River.

Paleoindian Period

The earliest well-documented occupation of North America is of big-game hunters dated between about 10,000 and 8,000 B.C. Evidence of the Paleoindian occupation of the Kansas River valley is in the form of scattered finds of diagnostic tools, including Clovis, Plainview, Agate Basin, Hell Gap, Scottsbluff, Frederick, and Milnesand points. The temporal range of these tools is from about 10,000-8,000 B.C. The majority have been found by amateur archaeologists and artifact collectors on gravel bars of the Kansas River where they are secondarily deposited (Wetherill 1994; Rogers and Martin 1982, 1983). The primary sites of deposition of these artifacts have yet to be located. Given the geomorphic setting of the Kansas River valley (discussed above), there is a high probability that they are derived from deposits underlying the Newman terrace (Wetherill 1994).

Other surface finds have been reported for surrounding areas of eastern Kansas supporting the interpretation of Paleoindian occupation of the region (Brown and Logan 1987; Schmits 1980a; Shippee 1953; Johnson *et al.* 1980; Schmits *et al.* 1987; Chambers *et al.* 1977:126-128; B. Logan 1987b:127-133; Yapple 1968). Investigation of the Diskau site (14RY303), located on the upland slopes of the Big Blue River drainage (a western north-bank tributary of the Kansas River), uncovered Clovis-like points dating to about 10,000 B.C. Activities represented at this Paleoindian occupation site were associated with cutting, scraping, and graving hard materials, such as bone and hard woods (Schmits and Kost 1985; Schmits 1987).

Dalton Period

The Dalton period is considered to be transitional between the Paleoindian and Archaic traditions. Information regarding the period from about 8,000-7,000 B.C. in Missouri suggests a shift from big game hunting to wider-based foraging and hunting of smaller animals (C. Chapman 1975). Diagnostic Dalton points have been found along the lower reaches of the Kansas River, including on some of the above-mentioned gravel bars, and surrounding areas of eastern Kansas (Wetherill 1994; B. Logan 1987a).

Archaic Period

The Archaic period from the end of the Dalton period, to about 500 B.C., is associated with a diverse hunting and gathering economy adapting to a changing environment, generally drier and warmer than during the Paleoindian period. Prehistoric human use of the Kansas River valley during this period is poorly documented. Burial of Archaic sites and limited archaeological survey are the primary factors affecting the extent of our knowledge of Archaic occupation of the region. As noted by Brad Logan (1987a:42-43), difficulty in recognizing diagnostic Archaic artifacts also limits the identification of these sites.

The presence of Archaic remains in the valley can be surmised from surface collections, such as those from the Kansas River gravel bars. Brad Logan (1987a:37-38) describes straight stemmed bifaces with flat or

concave bases and large blades, a basal-notched biface, Sedalia lanceolate bifaces, and contracting-stemmed, triangular-bladed bifaces in the Chandler Collection from the Kansas River gravel bars in the Bonner Springs-Edwardsville area. Although secondarily deposited, these artifacts indicate use of the Kansas River environs during at least the Late Archaic period. The primary site from which these materials were derived are likely buried in terrace fill adjacent to the river.

Our understanding of Archaic occupation of northeastern Kansas as a whole also is limited. Evidence of Early Archaic occupation comes from finds of lanceolate and large side-notched points (Schmits *et al.* 1987:216). One early Archaic site that has been investigated in the region is the Sutter site (14JN309), located along an intermittent tributary of the West Fork of Muddy Creek, which flows into the Kansas River from the north. Tools recovered during salvage excavation of the site compare with those of the Frederick (Plano) and McKean (Archaic) complexes (P. Katz 1971). Dates around 6,000 and 5,700 B.C. and the association with modern bison and grinding tools place use of this site at the beginning of the Archaic period (P. Katz 1972). Another Early Archaic component radiocarbon dated to about 6,270 B.C. has been recorded at the Cut-Bank site (14JF409) along the Delaware River, a north-bank tributary of the Kansas River. This site also contains a Middle Archaic component dated to about 3,760 B.C. (B. Logan 1990a:84-97).

The best documented Middle and Late Archaic occupation of the region is at the Coffey site (14PO1) along the Big Blue River, a western north-bank tributary of the Kansas River (Schmits 1978). Black Vermillion (Munkers Creek) phase components have been dated between about 3,370 and 2,250 B.C. (Schmits *et al.* 1987), coincident with the latter part of the Altithermal climatic episode. Artifacts (chipped and ground stone tools) and floral and faunal data from the Coffey site indicate broad-based hunting and gathering along the floodplain of the Big Blue River during late summer and early fall (Schmits 1978). El Dorado phase components in the Tuttle Creek area of the Big Blue River drainage indicate continued Late Archaic occupation between about 2,000-1,000 B.C. (Schmits *et al.* 1987:218-219). The Walnut River phase, also represented at the Coffey site, was originally identified as Late Archaic, but has since been redefined as Early Woodland (A. Johnson 1992:133).

The Late Archaic period (ca. 3,000-500 B.C.) is somewhat better documented in the Kansas City locality at the eastern end of the Kansas River drainage. The Nebo Hill phase has been identified in this region from surface finds of distinctive long, narrow-bladed lanceolate Nebo Hill points and assemblages including these diagnostic tools (e.g., B. Logan 1985:221, 1987a:33,36; Ritterbush 1993:6). The Nebo Hill site (23CL11) and others in western Missouri (e.g., Sohn site [23JA110], Turner-Casey [23JA35]) provide more detailed information about Late Archaic occupation of the region. A diverse hunting and gathering economy was followed and included harvest of a variety of wild plant and animal resources from surrounding prairies and woodlands (Reid 1984). Seasonal settlements were located on bluff tops, as well as in lowland settings. The earliest pottery in the region is also found at Nebo Hill sites and has been suggested to indicate exchange with other ceramic-producing, eastern Archaic populations (Reid 1980).

Woodland Period

Woodland period occupation of northeastern Kansas extends from about 500 B.C. to A.D. 900 and is characterized by widespread use of ceramics, incipient horticulture, growing social stratification, and expanded interregional interaction. Early Woodland (500 B.C.-A.D. 1) remains are very poorly documented throughout the region. Four sites in the Kansas City area of Missouri (Traff [23JA159], 23JA36, 23JA40, Bowlin Bridge [23JA38]) have components dated between about 500-300 B.C. (Wright 1980; Ziegler 1985a, 1985b:85-112; Peterson 1989; Schmits and Bailey 1989:515-517). Early Woodland occupation of the eastern Kansas River basin is evident from a Black Sand-like sherd from 14BN26 in the Delaware River drainage and a buried component radiocarbon dated to about 500 B.C. at 14JO46 along Cedar Creek (A. Johnson 1992; Logan and Hedden 1990). Walnut phase components originally defined as Late Archaic at the Coffey and other sites are now suggested to be Early Woodland (A. Johnson 1992:133).

Middle Woodland components are more abundant and occur within the Kansas River valley. These include components of the Kansas City Hopewell variant, which may represent western movement of Middle

Woodland peoples from the Illinois River valley to the Kansas City locality. The local Hopewell economy was based on hunting deer, turkey, and other animals; fishing, and gathering wild nuts and seeds, supplemented by early horticulture (E. Johnson 1972; Adair 1977, 1988, 1993; Adair and Feagins 1986). Semi-sedentary villages were occupied near bluff lines of tributaries and major rivers, while seasonally occupied hunting and gathering stations were located in the valleys of tributary streams (A. Johnson 1976b). Earthen mounds covering stone-vault tombs contain a variety of burial types and are commonly found on bluffs near villages (Wedel 1943:106-108). Three phases of Hopewell development have been defined on the basis of ceramic stylistic change (Johnson and Johnson 1975). These are the Trowbridge phase, A.D. 1-250; the Kansas City phase, A.D. 250-500; and the Edwardsville phase, ca. A.D. 400-650 (Johnson and Johnson 1975; C. Chapman 1980; B. Logan 1993:187-188).

Major Kansas City Hopewell sites, including the Trowbridge (14WY1), Miller (14WY8), and Perry (14JF315) sites, have been recorded in the Kansas River valley of eastern Kansas. The well-known National Register listed Trowbridge site, as well as the Miller site, has been largely destroyed, although assemblages from each are curated at the Wyandotte County Historical Society and Museum and the University of Kansas Museum of Anthropology. The Trowbridge site was located near the upper reaches of Brenner Heights Creek, a north-bank tributary of the lower Kansas River in Kansas City, Kansas, and the Miller site was located along Little Turkey Creek just above the Kansas River bottomlands near Edwardsville, Kansas. The Perry site is located further west on a terrace remnant along the Kansas River near Perry, Kansas (Witty 1979:21-22). Sites 14WY331 and 14DO1 also have been recorded on the floodplain or a terrace of the lower Kansas River (Witty 1979:15, 17). Little study has been completed of the collections from these sites (Bell 1976; Hirsch 1976; Reid 1976; A. Johnson 1983; Feagins 1989; Ritterbush and Kost 1983). Further upstream, the Brous (14PO25) and Ashland Bottom (14RY603) sites in the Kansas River bottoms near the Big Blue River and McDowell Creek, respectively, also contain Hopewellian artifacts (Wedel 1959:198-200; O'Brien *et al.* 1979; Witty 1979:28, 34).

The (Late) Plains Woodland period (ca. A.D. 400-900) appears to overlap the latter portion of Kansas City Hopewell (B. Logan 1993:187-188). A number of (Late) Plains Woodland taxonomic units have been proposed for the Central Plains. That which is most relevant to the Kansas River valley is the Grasshopper Falls phase. (See B. Logan [1987b:275-277 & 1990c:109-114] for an evaluation of the Wakarusa and Deer Creek phases relative to Grasshopper Falls.)

Grasshopper Falls phase sites have been identified throughout much of northeastern Kansas, including the Delaware River, Stranger Creek, the Wakarusa River (see B. Logan 1990b), and other Kansas River tributary drainages (Reynolds 1979, 1981; Reichart 1974; Logan and Fosha 1991; Barr 1971; Williams 1986; Baugh 1991). Most of the investigated components represent small settlements, often with paired structures along or near secondary drainages (Reynolds 1979:30, 73; Reichart 1974:31; Logan and Fosha 1991). Oval shelters were constructed of wattle and daub and had interior and exterior basin-shaped pits, presumably for storage (Reynolds 1979; Barr 1971; Williams 1986). The subsistence economy was based on hunting (with bow-and-arrow) and gathering, possibly with limited horticulture (Baugh 1991). A seriation based on ceramic surface finishes suggest that the Grasshopper Falls phase was an early (Late) Plains Woodland manifestation (A. Johnson 1984), while available radiocarbon dates range between A.D. 420 and 950 (Logan and Fosha 1991:14). Judging from isolated finds of Plains Woodland ceramics on gravel bars of the Lower Kansas River, sites of this affiliation may be expected along the River (B. Logan 1987:38).

The Schultz focus has been defined on the basis of burial remains (sometimes including Hopewellian-like artifacts) from the Republican River, a western tributary of the Kansas River (Eyman 1966). Other Woodland finds from the area (e.g., Milford Lake, Tuttle Creek, McDowell Creek) may belong to the Schultz focus (O'Brien *et al.* 1973; Parks 1978; Schmits *et al.* 1987:219). The validity of this taxonomic unit, however, has been questioned and should be carefully evaluated. Its presence along the Upper Kansas River (proper) has yet to be determined.

Plains Village Period

The Plains Village period extends from about A.D. 900-1400 (Logan and Ritterbush 1994). In general, this period is associated with archaeological remains indicating the presence of hunter-gatherer-gardeners relying to a greater degree than before on horticulture and a more sedentary lifeway. This applies to the Smoky Hill phase of the Central Plains Tradition, which is geographically associated with the upper or western portion of the Kansas River and the lower reaches of several of its primary tributaries, the Blue, Republican, Solomon, Saline, and Smoky Hill rivers. Although the majority of Smoky Hill sites have been recorded along tributaries of the Kansas River, several are known along the Kansas River valley. Among these is the Witt site (14GE600), which is located on a terrace of the shared floodplain of the Smoky Hill and Kansas rivers (M. Brown 1982). Smoky Hill sites have been found in a variety of topographic settings, including on terraces and uplands, and have in at least one instance been found buried in terrace fill (Ritterbush and Logan 1992).

Plains Village or Mississippian remains have also been found in the lower portion of the Kansas River region. Included are those of the Steed-Kisker phase, a semi-sedentary hunter-gatherer-gardener cultural complex exhibiting Mississippian influences. The majority of Steed-Kisker sites have been recorded on terraces along tributaries of the Missouri River in northwestern Missouri. These consist of settlement and burial sites (Wedel 1943; Calabrese 1969; Shippee 1972; O'Brien 1978a, 1978b; McHugh 1980). Steed-Kisker remains have also been found in Kansas along tributaries of the Kansas and Missouri rivers (e.g., Stranger Creek, Wolf Creek, Salt Creek) (B. Logan 1985, 1987a, 1988). A Steed-Kisker component near the Miller site along Lower Little Turkey Creek and shell-tempered sherds from the Lower Kansas River gravel bars attests to the presence of Steed-Kisker sites along the Kansas River valley (Feagins 1989; B. Logan 1987:38-39).

Also found in the eastern Kansas River region are remains of the Pomona variant. This cultural complex extends throughout much of the eastern third of Kansas and part of western Missouri, where it is also referred to as May Brook (K. Brown 1985c). No Pomona sites have been investigated directly along the Kansas River, but are known along several of its tributaries, including the Delaware and Wakarusa rivers and Stranger and Cedar creeks (K. Brown 1985c; B. Logan 1985, 1990b; Logan and Hedden 1993). Despite the contemporaneity of this complex with the Smoky Hill and Steed Kisker phases, the Pomona variant appears to be a continuing Late Plains Woodland adaptation influenced by neighboring Plains Village cultural complexes (Witty 1967, 1978:59-62, 1981; cf. Blakeslee and Rohn 1986:1292; K. Brown 1985c). This interpretation is based largely on the limited evidence for horticulture and unclear definition of patterned house forms.

Protohistoric Period

The Protohistoric period is defined as that interval of time during which Euroamericans were in North America, but had little or no direct contact with native populations in the region. For the Kansas River basin this includes the period extending from the end of the Plains Village period (between about A.D. 1400 and 1500) until the era of Euroamerican exploration in the early 1700s. Euroamerican explorers and traders had entered modern-day Kansas as early as A.D. 1541, but contact between native populations in the Kansas River region and any of these parties is poorly documented until the eighteenth century. Few, if any, archaeological remains in the Kansas River valley have been identified with this period.

Historic Period

Euroamerican traders were travelling the Missouri River as early as the late seventeenth and early eighteenth centuries. These individuals were probably the first to establish relatively regular contact with the native populations of eastern Kansas, namely the Kansa (Wedel 1946, 1959:50-54; Unrau 1971). This native group is likely related to the prehistoric and protohistoric Oneota of the Midwest migrating into the area during protohistoric times (Unrau 1971; cf., A. Johnson 1991; D. Henning 1993; S. Vehik 1993). In A.D. 1800 the Kansa moved from their eighteenth century home along the lower Missouri River valley to the area around present-day Manhattan, Kansas. Here they occupied the Blue Earth Village site (14PO24) on the Kansas River. Much of this site has eroded into the River since it was abandoned between A.D. 1830-1831 (Lees 1989:69; Wedel 1959:50-54, 187-197; Unrau 1971). Limited investigation of the site indicates that the Kansa had replaced much of their native material culture with Euroamerican goods by the nineteenth century (Wedel

1959:187-197). They lived in villages filled with earth and/or bark-covered lodges and followed a hunting-gathering-gardening economy.

No other native groups are documented along the Kansas River during the early Historic Period, although early Pawnee sites are recorded along the Republican River, a western north-bank tributary of the Kansas River. Two Pawnee fortified earthlodge village sites have been investigated along this river. They are the Kansas Monument site (14RP1) in extreme northern Kansas and the Bogan site (14GE1) in Geary County, Kansas (Witty 1968; Roberts 1978; Marshall and Witty 1990). Conflicts between the Kansa and Pawnee were common during the early nineteenth century (Unrau 1971).

The Kansa moved from the Blue Earth village between A.D. 1830-1831 to the middle reaches of the Kansas River along lower Mission Creek, where they occupied several sites until about A.D. 1846 (Wedel 1959:50-54; Unrau 1971). Hard Chief's village (14SH301) on an upland ridge near the confluence of Mission Creek and the Kansas River has been investigated by the Kansas State Historical Society and Kansas Anthropological Association (Thies 1988). The nearby villages of Fool Chief and American Chief have not been located. A short-lived Methodist Episcopal mission was built along Mission Creek and Cyprian and Frederick Chouteau maintained a trading post nearby (Unrau 1971).

The Kansa subagency, first operated by Daniel Morgan Boone and others, was established downstream from the Kansa villages in A.D. 1827 along the Kansas River south of present-day Williamsburg. Also associated with the subagency was the Methodist Episcopal mission sporadically between A.D. 1830 and 1846. Nearby was a second trading post of Frederick Chouteau and the nearby village of Chief White Plume (Unrau 1971).

In addition to Cyprian and Frederick Chouteau's trading activities near the Kansa villages were those of other Euroamerican traders and the Chouteaus elsewhere along the Kansas River. Little is known of other traders in the area. The Chouteau family (primarily Frederick, Francis, and Cyprian) maintained control over much of the trade, as evident from their strong ties to the Kansa. Part of their trade with the Kansa was conducted away from the villages and subagency at as yet unlocated posts at "Kawsmouth" near the confluence of the Kansas and Missouri rivers and along the Lower Kansas River valley ("the Four Houses") (Barry 1972:88, 103, 131; Unrau 1971).

After the Treaty of 1825 between the United States government and the Kansa Indians, other treaties were negotiated that established reservations in eastern Kansas with various immigrant Indian tribes. The Kansa reservation overlapped the western portion of the Kansas River proper, while the Delaware reserve bordered on the north bank of the lower Kansas River and the Shawnee reserve bordered on the south bank (Richmond 1974; Unrau 1971). Heisler and Smith (1874:10) state that many of the Merrimac or Chillicothe band of Shawnee from the Cape Girardeau area of Missouri arrived in Kansas in A.D. 1828. Frederick Chouteau established a trading post along the south side of the Kansas River approximately 100 miles above its mouth to trade with the Shawnee. Chouteau's post was washed away in the A.D. 1844 flood, and he moved into the lower Mill Creek valley of present-day Johnson County, Kansas, to establish a farm following that disaster. In A.D. 1830 a Methodist Episcopal mission was established for the Shawnee and operated until A.D. 1862. Baptist and Quaker (1837-1869) missions soon joined the efforts directed towards the growing number of Shawnee from Missouri and, later, Ohio (Blair 1915; Barnes 1969; Heisler and Smith 1874). A mission for the Pottawatomie was run by the Baptists west of present-day Topeka (now next to the Kansas History Museum) between A.D. 1849-1861 (after the Kansa had been removed to the Neosho River) (Barr 1977).

Delaware immigrants from southwestern Missouri first settled in present-day Wyandotte County, Kansas, west of the Kansas River mouth in A.D. 1830 (Barry 1972:178-179). Soon thereafter, Moses R. Grinter started operation of a ferry from Delaware lands over the Kansas River (Barry 1972:181-182). (The Grinter Place is listed on the National Register of Historic Places and is managed by the Kansas State Historical Society.) In A.D. 1843 the Wyandot Indians purchased land in the fork of the Kansas and Missouri rivers from the Delaware (Merwin 1906). A Baptist mission was established in A.D. 1832 near present-day Edwardsville, Kansas, for the

Delaware Indians and continued with the Wyandot Indians in Wyandotte County until A.D. 1867 (Richmond 1974:37). Other missions to the various Indian groups in eastern Kansas were established by various religious sects through the mid 1800s when many of the immigrant Indians ceded their Kansas lands to the government in order to make room for Euroamerican settlers (Richmond 1974).

The military post of Fort Riley was established along the western reach of the Kansas River proper in A.D. 1853 (Pride 1926; Barry 1972:1154-1156; O'Brien 1985). Its primary jurisdiction was over the western Kansas River basin and played an important role in the late nineteenth century Indian wars.

Kansas Territory was established in A.D. 1854 under the regulation of "popular sovereignty," to determine whether or not slavery would be allowed. In an effort to guarantee Kansas as a free state, Eastern abolitionists organized to settle the territory with anti-slavery supporters. The best example of this is the New England Emigrant Aid Company, which supported the settlement of Wakarusa (Lawrence) and Topeka on the Kansas River. Wabaunsee was also settled by free-state settlers of the Connecticut Kansas Colony as the "Beecher Bible and Rifle Colony" (Richmond 1974:63-66). Proslavery factions also existed in the state and neighboring Missouri, resulting in conflicts over the issue of slavery. The establishment of Lecompton (between Lawrence and Topeka) as the territorial capital in A.D. 1856 added to the conflict and influencing early attempts at gaining statehood. Statehood was gained in A.D. 1861. Later conflicts associated with the Civil War extended as far west as Lawrence, where the famous Quantrill's Raid of A.D. 1863 occurred (Goodrich 1991).

Many Euroamerican settlers entered Kansas or passed through the area travelling along the Kansas River in the early to mid 1800s. Several branches of the Oregon-California trail crossed the Kansas River at established ferry crossings. Papin's landing was located near present-day Topeka and Uniontown crossing (and government trading post) was near Willard (Richmond 1974:47-48). Another route of travel was the Kansas River itself. Traders often travelled in pirogues or keelboats and in A.D. 1854 the steamboat *Excel* made several trips up the Kansas River to newly established Fort Riley. A short trip up the Smoky Hill River was also made by the *Excel*. A later steamboat, the *Financier 2*, ascended the Kansas River to Fort Riley the following year and about 40 miles of the Republican River (Greene 1906). At least 30 other steamboats plied the Kansas River between A.D. 1854 and 1866. Several of these were able to travel as far as Fort Riley, but most went only as far as the early towns of Lawrence, Lecompton, Tecumseh, or Topeka. Low water, sandbars, and snags were major obstacle to river traffic during most years and by A.D. 1864 the Kansas River was declared unnavigable (Greene 1906). At least one steamboat, the *Hartford*, ran aground, caught fire and burned along the Kansas River across from St. Marys, Kansas (Greene 1906:328-330; Richmond 1974:54). A portion of its machinery was salvaged and the remainder was buried nearby (Greene 1906:329-330).

Early settlements and farms continued to be established along the Kansas River in the 1860s and 1870s. The state capitol was built in Topeka and various continuing institutions were established in the Kansas River towns of Lawrence (University of Kansas, Haskell Indian Nations University), Topeka (Washburn University), and Manhattan (Kansas State University). The Union Pacific Railroad extended up the Kansas River valley in A.D. 1864. With the extension of this and other railroads through eastern Kansas, the Kansas River no longer served as the primary route of trade, travel, and communication.

E. The Grand River from its confluence with the Missouri River upstream to Pattonsburg, Missouri by Lauren W. Ritterbush

Past human settlement was strongly influenced by geographic and geomorphic factors. As a rich environmental zone along the southern edge of the Prairie Peninsula, the Grand River valley no doubt was an important area of resource exploitation for native and immigrant populations. Certain factors, such as flooding and drainage, may have made occupation of the base floodplain precarious and unpleasant at times. Nonetheless, more suitable terrace or upland surfaces in and adjacent to the valley were probably preferred habitats of prehistoric and historic populations. This has been shown through the presently limited archaeological and historical investigations of the region. To date no thorough geomorphic studies have been completed for the Grand River valley, also limiting our understanding of site preservation. The following review of existing geomorphological, archaeological, and historical information from the Grand River and surrounding areas provides some understanding of the geographic factors influencing past human utilization of the study area and the preservation of its associated cultural resources, the chronology of prehistoric and historic use of the area, and the types of significant properties located therein.

Physical Characteristics

The Grand River and its tributaries drain much of northwestern Missouri, as well as parts of southern Iowa, and flow through the Dissected Till Plains (Fenneman 1938). This physiographic region was formed through erosion of glacial deposits overlying older bedrock. The resultant topography is characterized by broad upland surfaces and rolling hills that break into dissected slopes near relatively deep and wide valleys. This area is part of the Prairie Peninsula and has a prairie-deciduous forest mosaic with wooded areas along the many south-flowing streams tributary to the Grand River.

No geomorphic studies have been completed for the Grand River valley. A major gap in our knowledge of this large drainage system has yet to be filled. A cursory examination of soil survey data for portions of the Grand River indicates that terraces are present in the valley. It is possible that these surfaces and their fill may date to prehistoric periods of occupation, such as those in the Little Platte River drainage west of the study area (Gardner and Donahue 1985). Concerted geomorphic study is required for the Grand River valley.

Cultural Historical Overview

Despite its size, the Grand River drainage has received little archaeological attention. Few systematic archaeological investigations have been conducted in the Grand River drainage. The majority of these have resulted from a few cultural resource management surveys undertaken since 1970 (Boyd 1981, 1982; Boyd and Walters 1983; Bray 1979a, 1979b, 1980, 1981; Chomko and Griffin 1975; Cooley and Fuller 1976; Heartfield, Price, and Greene 1980; Sturdevant 1982; R. Vehik 1971). Despite the limited nature of the Grand River archaeological (and geomorphic) investigations, a rich archaeological record, possibly dating back more than 12,000 years, is evident from these studies, site survey files, and private collections.

Paleoindian Period

The Paleoindian period of big game hunters from about 10,000-8,000 B.C. is poorly known in the Grand River region. No surface finds of fluted points were recorded in this area as of 1975 (C. Chapman 1975:67). One probable Folsom point associated with chipped stone debris has since been recovered from the Shriver site (23DV12), located on an open upland overlooking the Grand River. Thermoluminescent dating of heated cherts associated with the level from which these materials were recovered resulted in dates of $8,690 \pm 1,000$ and $12,855 \pm 1,500$ B.C. (Reagan *et al.* 1978). Possible chipped stone artifacts are also found below this level implying Pre-Clovis age. The validity of this latter interpretation has been questioned (Reid 1981).

Dalton Period

The transition from Paleoindian big game hunters to the Archaic tradition of wild plant and animal foragers is marked by the Dalton Period in Missouri from about 8,000-6,000 B.C. Like the Paleoindian period, little or no evidence of this period has been recorded in the Grand River drainage, although private collections from Chariton and Carroll counties include Dalton materials (C. Chapman 1975:102-104; Cooley and Fuller 1976:19, 45).

Archaic Period

The Archaic period from the end of the Dalton period to about 1,000 B.C. is associated with a diverse hunting and gathering economy adapting to a changing environment generally drier and warmer than during the Paleoindian period. Like earlier periods, the Early and Middle Archaic periods are poorly represented in the Grand River region. Late Archaic remains affiliated with the Nebo Hill phase, more thoroughly documented in the Kansas City locality, are present in the Grand River drainage (Wright 1987:B-10-3; Fisher 1987).

Woodland Period

The Woodland period from about 1,000 B.C. to A.D. 900 is characterized by widespread use of ceramics, rudimentary cultivation of native and tropical domesticates, growing social stratification (as evident from burial practices associated with mounds), and expanded interregional interaction. Evidence of Woodland period use of the Grand River area is present, albeit, limited. Black Sand ceramics have been found at Long Branch Lake on the Chariton River, east of the Grand River drainage, suggesting Early Woodland occupation of the region (Grantham 1986). The Central Missouri Hopewell of the Middle Woodland period is better documented in the region, but is known primarily from large village sites located along the Missouri River near the mouth of the Grand River (Kay 1979, 1980; Cooley and Fuller 1976). Hopewell use of tributary drainages is evident from the neighboring Chariton River valley where Snyders-like points and smooth pottery decorated with punch and boss decorations are found (Grantham 1986). Late Woodland remains have been identified with the Randolph phase, defined from studies in the Chariton River drainage (Shields 1966). This phase is associated with plain conoidal, grit-tempered pottery; Steuben and Rice projectile points, and mound building. The lack of Scallorn points suggests an early Late Woodland date (C. Chapman 1980:110, 112). Cooley and Fuller (1976:20) mention evidence of the Randolph phase in the Grand River valley and the mounds and some of the cultural materials described by Martin (1949) may fit this complex.

Mississippian Period

The Mississippian period is characterized by semi-sedentary hunter-gatherer-gardeners, who made shell-tempered, smooth-surfaced pottery and small triangular side-notched arrowpoints. This period is best characterized in northwestern Missouri by the Steed-Kisker phase. The most intensively studied sites of this phase are located in the Missouri River drainage of northeastern Kansas and northwestern Missouri. These components have been dated between A.D. 950-1400 (Logan and Ritterbush 1994). This phase has been linked to Cahokia and is believed by some to represent a migrant population of farmers who served as middlemen in a Mississippian trade network between the prairie-plains region and Cahokia (O'Brien 1978b; Wedel 1943; cf. Calabrese 1969; McHugh 1980). Remains of this complex have been found in the Grand River drainage (Wright 1987:B-10-3).

Protohistoric Period

The Protohistoric period includes that period of time following the Mississippian period and before the time when native populations had regular contact with Euroamericans. Although prehistoric lifeways continued much like those of the Mississippian "Prairie Village Farmers" (C. Chapman 1980), the effects of indirect and very limited direct Euroamerican contact were felt through the introduction of new technology and diseases. The cultural complex that best fits this period in northwestern Missouri is the Middle to Late Mississippian Oneota. A series of Oneota components, including those at the Utz, Gumbo Point, Guthrey, Dowell, and Silvey sites, have been investigated along the Missouri River just upstream from the mouth of the Grand River. Oneota

developments likely extended up the Grand River as suggested by Dale Henning (1970).

Historic Period

The Historic period of northwestern Missouri starts in the late seventeenth and early eighteenth centuries, when Euroamericans entered the area to establish semi-permanent trading centers. The Missouri Indians were found to be living on the Missouri River near the mouth of the Grand River when de Bourgmont arrived in the early 1700s. The Little Osage Indians moved to that same area soon thereafter to take advantage of the trade (Chapman and Chapman 1964). De Bourgmont's Fort Orleans (A.D. 1723-1728) located near the Missouri village supplied these groups with trade goods, while the nearby Grand River valley no doubt served as an important resource area for hunting and gathering. By the 1790s the Missouri and Little Osage Indians had abandoned the area (Bray 1991:9). The Iowa, Sac, and Fox Indians utilized the upper reaches of the Grand River during the early nineteenth century (Foley 1989:247).

Euroamerican immigrants arrived along the Lower Missouri River and surrounding areas in the early nineteenth century to establish farms and towns. Many of the early settlers to claim lands along the Grand River were from the southern states of Kentucky, Tennessee, and Virginia (Cooley and Fuller 1976; March and Stephens 1977; Pauls 1985:2). Another group of immigrants to settle in the area, particularly in Caldwell County along Shoal Creek, a western tributary of the Grand River, were Mormon. This population arrived in A.D. 1837 and early 1838, but was forced to leave after the 1838 Mormon War (LeSueur 1987). Immigrants en route to Oregon and California during the 1840s and 1850s travelled across the Grand River valley along the "Bloomington Road" (Benham 1990).

The town of Brunswick was established in A.D. 1836 at what was then the mouth of the Grand River (Smith and Gehrig 1923:238-239). (Shifts in the course of the Missouri River have moved the mouth of the Grand several miles south of that location [Cooley and Fuller 1976:68-69].) Other towns further upstream were established around mills (e.g., Haun's Mill, Millport) and as county seats.

Much of the area has maintained a rural setting through most of its nineteenth and twentieth century history. Farming has been the major industry of the area. Tobacco was the first important crop in the area brought by the southern immigrants of the early nineteenth century (Cooley and Fuller 1976; March and Stephens 1977). Its importance diminished as new crops and livestock were accepted and adapted to the natural and social setting of the region.

Transportation has been provided since the 1860s by several railroad lines that cross the Grand River valley. Roads and highways continue to serve the largely rural communities. Federal highways 24, 36, 65, 69, and 35 cross the valley at its major communities of Brunswick, Chillicothe, and Pattonsburg.

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