AD-A262 928

ICUMENTATION PAGE

Form Approved
OMB No. 0704-0188

2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
SEPT 1979	Backgruond data

4. TITLE AND SUBTITLE
A Survey Level Report of the Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project St.Francis River Stoddard and Butler Counties, MO

5. FUNDING NUMBERS
C DACW66-78-C-0054

6. AUTHOR(S)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Iroquois Research Institute

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Dept. of the Army
Memphis District Corps of Engineers
B-202 Clifford Davis Federal Bldg.
Memphis, TN 38103

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
12

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT
unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*
Field notes,sketches, and Artifact inventory sheets

14. SUBJECT TERMS	15. NUMBER OF PAGES
	@300
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20 LIMITATION OF ABSTRACT
			1

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A Survey Level Report of the

Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project

St. Francis River
Stoddard and Butler Counties, Missouri

Archaeology, History, and Architecture

Prepared for

Corps of Engineers
U.S. Army
MEMPHIS DISTRICT

UNDER CONTRACT
DACW 66-78-C-0054

Iroquois Research Institute

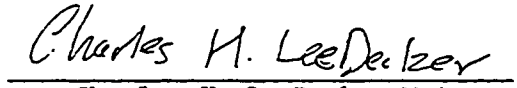
September 1979

CONTRIBUTORS

OF

IROQUOIS RESEARCH INSTITUTE

Principal Investigator



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ABSTRACT

An intensive survey for prehistoric, historic. and architectural properties within the Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project area located in Butler and Stoddard Counties, Missouri, was conducted in May and June 1978. The study methods included a review of published literature, a review of county, state, and federal archival sources, a cartographic review, interviews with local informants, intensive field examination, and archaeological analysis of artifact collections. A total of 54 sites were inventoried during the field survey. The prehistoric properties include sites dating from the Paleo-Indian, Archaic, Woodland, and Mississippian Periods. The historic properties include a small number of 19th century farmstead remains and a large number of 20th century sites of various types. The architectural properties include permanent dwellings, agricultural outbuildings, fishing cabins, outhouses, and sheds. Three sites are considered potentially eligible for inclusion in the National Register of Historic Places. Options proposed for mitigation of adverse effects include avoidance of the sites during construction, archaeological data recovery, and in situ preservation.

The project area includes portions of the Meander Belt Physiographic Zone and the Apron Deposit Physiographic Zone, and the survey results indicate occurrence rates of 6.8 prehistoric sites per square mile, 15.1 historic archaeological sites per square mile, and 15.1 architectural sites per square mile in the Meander Belt Physiographic Zone and 13.9 prehistoric sites per square mile, 13.9 historic archaeological sites per square mile, and 27.8 architectural sites per square mile in the Apron Deposit Physiographic Zone. These data may be useful in the development of a predictive model for cultural resources within the entire St. Francis Basin.

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INTRODUCTION

Scope of the Present Study

An intensive survey for cultural resources was conducted by Iroquois Research Institute within the right-of-way boundaries associated with the Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project as directed by the U.S. Army Corps of Engineers, Memphis District, under the conditions stipulated in Contract No. DACW66-78-C-0054. This project is one of more than twenty separate Component Investigation Studies included in the contract "Survey for Archaeological, Architectural, and Historic Resources Within the St. Francis Basin, Missouri and Arkansas." A Component Investigation Area Study (CIA) is a contractual term associated with discrete task authorizations. A CIA as used herein may be a reconnaissance or an intensive survey, including testing. In addition to these cultural resource reconnaissance and intensive survey (CIA) projects associated with drainage improvement projects which will be be constructed by the Corps of Engineers, Iroquois also prepared a research design for a predictive model for cultural resources within the entire St. Francis Basin (Iroquois Research Institute 1978a).

The level of investigation performed for this project is defined in the contract as follows:

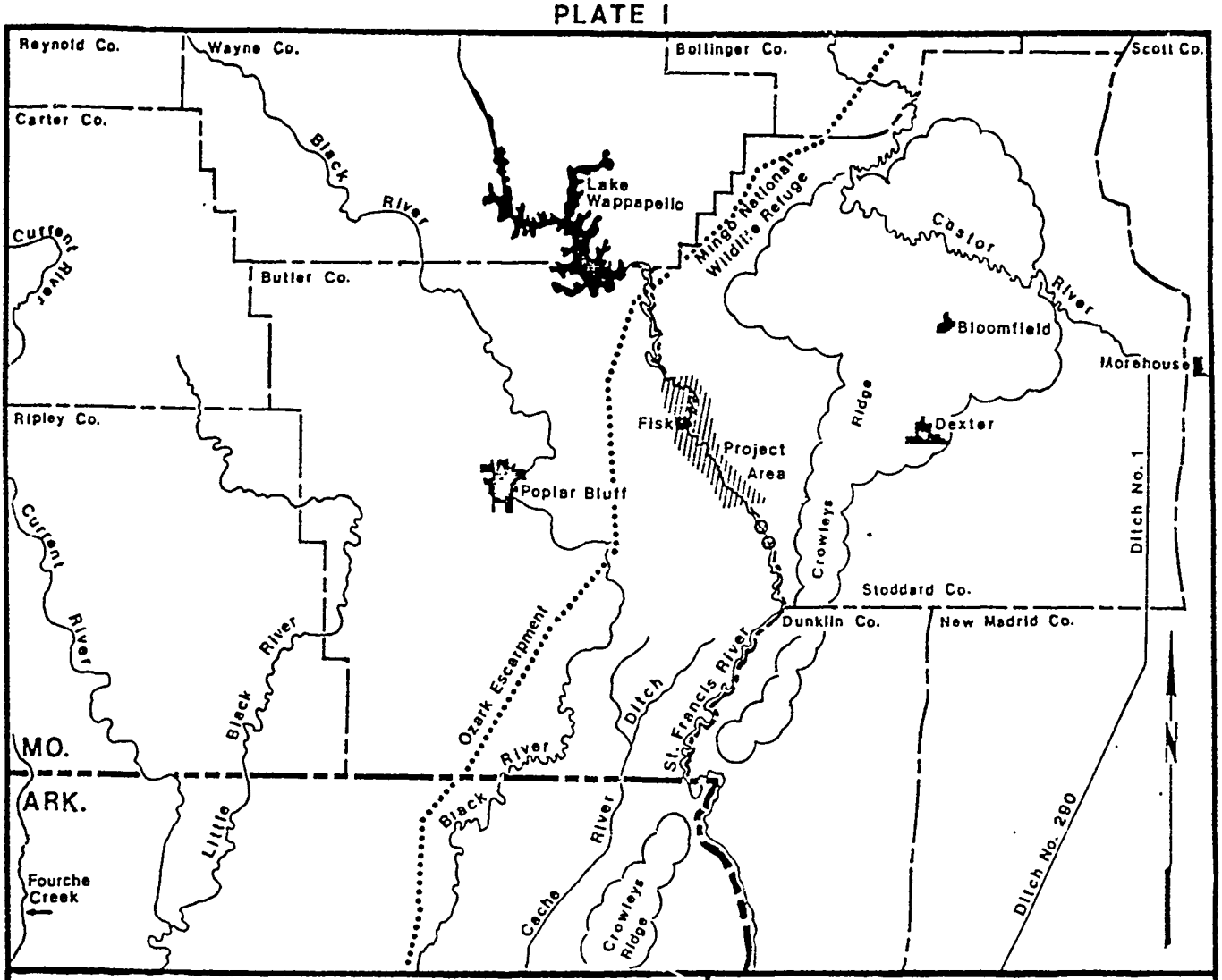
> The survey level of investigation shall include (a) literature search, records review, and intensive on-the-ground examination and testing to determine (the) number and extent of resources present, cultural and scientific importance, and time and cost required to preserve, recover, or otherwise mitigate adverse impacts (Contract No. DACW66-78-C-0054, page A-4).

The study was performed as required by the National Environmental Policy Act of 1969 (Public Law 91-190), "Protection and Enhancement of the Cultural Environment" (Executive Order 11593), the Procedures for the Protection of Historic and Cultural Properties (36 C.F.R. 800), and the National Historic Preservation Act of 1966 (Public Law 89-665).

Project Location and Description

The Wappapello to Crowleys Ridge project consists of three segments of the St. Francis River in Butler and Stoddard Counties, Missouri (Plates 1 and 2). Combined, these three segments account for approximately 33.8 channel kilometers (21 miles). The upstream segment, which runs for 32.5 stream kilometers (20.2 miles), extends from about 8.0 kilometers (5 miles) north of Fisk, Missouri to the confluence of the St. Francis River and Mingo Ditch, approximately 7.2

PLATE I



LEGEND

- Wappapello to Crowleys Ridge Project
- Cities
- State Boundaries
- County Boundaries
- Waterways
- Ozark Escarpment

SCALE

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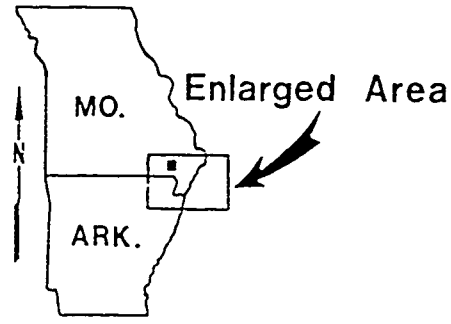

Iroquois Research Institute

Prepared For:
U.S. Army, Corps of Engineers
Memphis District

VICINITY MAP

of

Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project

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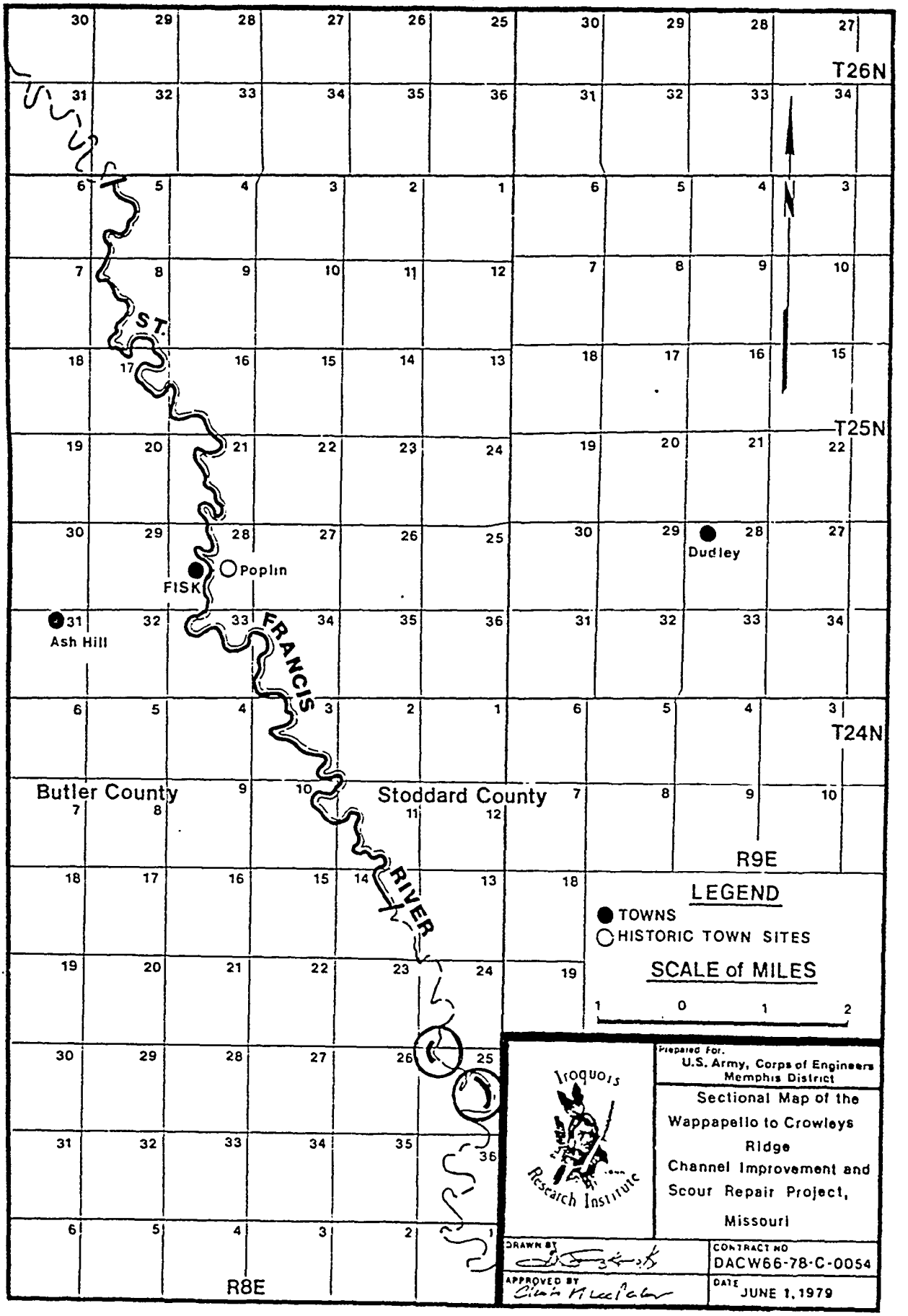
APPROVED BY CHL 5/22/79	DATE May 21, 1979

PLATE 2


T26N
T25N
T24N
R9E
R8E
ST. FRANCIS RIVER
FISK
Poplin
Dudley
Ash Hill
Butler County
Stoddard County
LEGEND
TOWNS
HISTORIC TOWN SITES
SCALE of MILES
1 0 1 2
Iroquois Research Institute
Prepared For.
U.S. Army, Corps of Engineers
Memphis District
Sectional Map of the
Wappapello to Crowleys
Ridge
Channel Improvement and
Scour Repair Project,
Missouri
DRAWN BY
CONTRACT NO
DACW66-78-C-0054
APPROVED BY
DATE
JUNE 1, 1979

kilometers (4.5 miles) south of Fisk. The central segment encompasses approximately 305 meters (1,000 feet) of the river and is located about 2.8 kilometers (1.75 miles) to the southeast of the confluence of Mingo Ditch. The downstream segment encompasses approximately 762 meters (2,500 feet) of the St. Francis River and is located immediately north of the confluence of the St. Francis River and Dudley Main Ditch. Since the St. Francis forms the boundary of the two counties, the project will affect portions of western Stoddard County and eastern Butler County.

The project design maps (files 41H/51.3 drawings 1 through 8) indicate that channel improvement is only scheduled for the upstream segment of the Wappapello to Crowleys Ridge project and that it will affect approximately 32.5 channel kilometers (20.2 miles). No excavation of the channel is planned for this segment. The channel improvement will be limited to the removal of the undesirable vegetation growing along both sides of the existing channel. The right-of-way which is to be acquired in order to complete this action is to extend 91.4 meters (300 feet) from the channel centerline to both sides of the river. This particular project feature was revised from the design maps (41H/51.3 drawings 1 through 8) which indicate a different right-of-way.

Additional project maps (files 41K/457 through 41K/461) indicate that the scour repair is scheduled for the two downstream segments of the project. The plans for these segments include channel excavation, berm construction, and the relocation of a short segment of an existing gravel road.

The project design maps employed in this study are referenced by the Corps of Engineers under files 41K/457 through 41K/461 and 41H/51.3, 41H/54.3, 41H/55.2, 41H/56.5, 41H/190.2, 41H/191.3, 41H/57.2, and 41H/58.

DISPOSITION OF BACKGROUND DATA

In addition to this narrative report, cultural resource data gathered during Iroquois Research Institute's survey of the project area have been submitted to the U.S. Army Corps of Engineers, Memphis District. The data which have been submitted include (1) maps showing the location of the identified cultural resources and the degree of surface visibility that existed throughout the project area at the time of the field examination, (2) completed copies of the site survey forms used during the field investigation, and (3) color coded 5 x 8 inch site record cards following the contractually specified format. Artifacts recovered during the field operation are currently being curated by Iroquois Research Institute. Upon completion of Iroquois' present work with the Memphis District Corps of Engineers, the Federal government will arrange for the appropriate placement of these recovered materials.

ENVIRONMENTAL SETTING

Climate

The project area is within the Humid Continental Climate zone but is somewhat influenced by maritime air masses originating over the Gulf of Mexico in the summer months. Weather records for a 26 year period at Poplar Bluff, Missouri, about 18 kilometers (11 miles) west of the project, show that the average annual temperature is 14.5°C (58°F), with the highest monthly mean being 26.7°C (80°F) in July and the lowest 2.4°C (36°F) in January (USDA 1941). The mean length of the growing season is 191 days, a period usually occurring between about April 10th and October 20th.

The average annual precipitation of 121.4 centimeters (47.8 inches) is fairly well distributed with February being the driest month with 6.9 centimeters (2.7 inches) and May the wettest with 11.7 centimeters (4.61 inches). A measurable amount of snow falls during most winters, but snow is an insignificant portion of total precipitation.

Physiography and Topography

The Wappapello to Crowleys Ridge project area stretches for about 19 kilometers (12 miles) along the St. Francis River and falls entirely within the boundaries of the Western Lowland Division of the Mississippi Alluvial Valley Physiographic Province. In this reach, the St. Francis River is a meandering stream and its meander belt is a reworked section of a relict braided terrace of the Mississippi River (Saucier 1964). At its northern end, the project lies within the Apron Deposit Physiographic zone for a distance of approximately one mile. Elevations of undisturbed ground in the vicinity of the project range from 91.4 meters (300 feet) above sea level at the southern end to 102.1 meters (325 feet) at the northern end. The maximum local relief is about 10 feet.

Geology and Soils

The soils and the surficial geological deposits in the area are characteristic of active meander belts in that they form a complex pattern, occurring with variable textures in short vertical and horizontal distances. Corps of Engineers soil boring data (Memphis District, Corps of Engineers Project Design Map 5, Files 41H/57.2 and 41H/58:1967) indicate that the texture of the surface soil horizons is predominantly lean clay or silt. The principal soil associations in the area are the Calhoun-Amagon and Tuckerman-Bosket. The Calhoun-Amagon Association is characterized by nearly level soils with loamy subsoils. The Tuckerman-Bosket Association is characterized by nearly level to moderately steep soils that have loamy subsoils.

Presently, the lowest parts of the project area are frequently flooded. Prior to the construction of the levees along the St. Francis and Mississippi Rivers, flooding was more widespread.

According to Saucier (1964), colluvial deposits from the Ozark and Crowleys Ridge Upland areas which form the Apron Deposit Physiographic zone overlie the meander belt and relict braided terrace deposits in the northernmost mile of the project area. These colluvial materials have a predominantly silty texture and are usually somewhat better drained than the meander belt deposits. The land surfaces in both the Apron Deposit and Meander Belt Physiographic zones may be presumed to be much younger than the potential maximum age shown for this area in Plates E and E2 since the surfaces are a reworked section of a relict briaded terrace.

Ecosystems

A considerable portion of the area between Mingo Ditch and the St. Francis levee remains forested. These forested areas have either poorly drained soils, are frequently flooded, or both. The predominant trees are oak, maple, sycamore, locust, poplar, willow, and beech.

It is difficult to establish whether or not the tree species currently growing in the area occur in proportions resembling the mix which existed prior to the general deforestation of the region. Shelford (1963) has described a series of Mississippi River floodplain plant communities and the associated fauna which probably were attained in this area at various times prior to deforestation. The succession of floodplain plant communities is somewhat time dependent but is more dependent upon soil drainage and the frequency and duration of flooding. The plant communities that could have existed in the vicinity of the Wappapello to Crowleys Ridge project area during prehistoric times are, in successional order: Sandbar Willow, Willow-Cottonwood, Elm-Sweetgum, and Oak-Hickory Forests.

Shelford (1963:100), in summarizing the fauna of the floodplain plant communities, presents evidence that all the large and medium sized mammals of the region inhabited the floodplain to some degree during the prehistoric period. These included elk, deer, bear, wolf, mountain lion, and bobcat. Other animals usually present were racoon, opposum, fox, gray squirrel, and fox squirrel. In addition to mammals, the area supported a large population of reptiles, amphibians, fish, and birds.

BACKGROUND STUDIES

Archival Review

Federal archives were reviewed to identify known cultural resources which might be in the project area. These archives included the National Register of

Historic Places, the Historic American Engineering Record, and the Historic American Buildings Survey including the Pictorial Archives of Early American Architecture and the Master Catalog of Architectural Collections. No prehistoric, historic, or architectural properties listed on the National Register of Historic Places or pending nomination to the Register are located within the project area. The Historic American Engineering Record and the Historic American Buildings Survey had no records pertaining to any structure in the project area.

State and county archives were also reviewed. Specifically, the Missouri Historic Sites and Buildings Inventory and the Missouri Historical Society's listings of historic sites were obtained for Butler and Stoddard Counties. These sources indicated that no historic properties were located in the project area. However, one site listed on the Missouri Historic Sites and Buildings Inventory for Butler County, the Tom McGill Home, lacked the sufficient locational data needed to determine its location relative to the project area. Subsequent field examination determined that this site is not within the project boundaries.

In order to identify any known prehistoric sites in the project area, a careful review was undertaken by Iroquois Research Institute personnel of the Missouri Archaeological Survey listings and of the records retained at the Office of Historic Preservation, Missouri Department of Natural Resources. As of May, 1978, a total of 164 sites had been recorded by the Archaeological Survey of Missouri in Butler County and 158 sites had been recorded in Stoddard County. None of these sites are in sections that will be affected by the present project.

Cartographic Review

In order to evaluate the potential for discovering cultural resource sites within the Wappapello to Crowleys Ridge project area, map collections at the National Archives Center for Cartographic and Architectural Archives, the Library of Congress Maps Division, and at the Bureau of Land Management Plat Library were reviewed. The purpose of the cartographic review, in addition to obtaining data on historic land use and settlement patterns, was to provide locational verification and a general dating method for features identified during the field investigation that correspond to features marked on the maps. There are, however, time gaps between the map dates in addition to problems with the accuracy and level of map coverage. Thus, some sites may have been occupied and abandoned between survey years, while others may have been selectively eliminated by the cartographer. Despite possible inaccuracies or omissions, and the absence of data for varying time periods, cartographic review is a valuable source of information.

The collections at the National Archives include a variety of historic maps pertaining to Missouri. Iroquois Research Institute personnel specifically reviewed local Missouri Survey Plats compiled by the General Land Office (GLO), an index of maps produced by the U.S. Army Corps of Engineers, a listing of maps

that resulted from military operations in Missouri during the Civil War, and a collection of political and specialized topical maps. These maps were carefully checked for the occurrence of structures, roads, farm fields, railroads, environmental features, and other indicators of historic period and prehistoric activity. Any such features noted were then related, as accurately as possible, to the specific project features associated with the Wappapello to Crowleys Ridge Channel Improvement and Scour Repair Project.

In addition to the historic maps, aerial photographs of Stoddard County taken in the late 1930's and early 1940's were checked. These photographs were utilized in an effort to gain familiarity with the general conditions of the project area, rather than for the more specific tasks of determining the location of cultural resources. The photographs indicate that by 1940, the areas immediately surrounding the project north of Fisk, Missouri were intensively cultivated. Such was not the case for the southern reaches of the project area (Plate 2).

The earliest map to give an indication of the potential for locating historic period sites within the project area is an 1827 map (Map of the States of Missouri and Illinois and the Territory of Arkansas) which shows much of the entire St. Francis River Basin as a swamp. The specific area of the Wappapello to Crowleys Ridge project is shown generally to be within this swamp.

An 1844 map (Sectional Map of the State of Missouri) shows no cultural features in the immediate project vicinity. The nearest towns are Bloomfield, the county seat located roughly 15 miles east of the project area, and West Prairie, a village or post office roughly 12 miles to the southeast. Two other towns or villages, Greenville and Cane Creek, are shown within 25 miles of the project. All of these locales are shown to be connected by roads or paths, none of which intersect the project. As indicated on the earlier map, the area is primarily within and adjacent to lowland swamps. In order to determine whether or not these early maps accurately represent the past conditions of the Wappapello to Crowleys Ridge project area, more localized maps were examined.

The 1848 GLO survey plats for Township 24 North, Range 8 East and Township 25 North, Range 8 East were reviewed as well as the 1848 and 1849 partial plats for Township 26 North, Range 8 East. The natural features of the southernmost township, T24N,R8E include swamps, sloughs, several small ponds, and at least one lake. Approximately one mile west of the St. Francis River is "Menokene slough" which is bordered by a path. The slough originates in Section 3 and flows from "Menokene Lake" located within 0.25 miles of the river to the south. Two "improvements," or cultivated fields are indicated within the township, one adjacent to the river in Section 11, and one in Section 29.

The plat for the adjoining township to the north, T25N,R8E exhibits a similar environment of sloughs and swamps. Several sizeable oxbow lakes are also noted in addition to small ponds. A total of five farm plots are mapped, all located east of the St. Francis River. Two of these may be located within the

project right-of-way: M. Acher's in Section 5 and Howard's in Section 16. The other three farm plots lie wholly or partly within Section 4 and include P. Rof's, Hobbs's, and Martin Ascher's. These farm plots, with the exception of Martin Acher's, all contain a structure adjacent to the field. In addition, two smaller improvements are indicated near the river in Sections 6 and 21, neither of which is labelled or contains a structure.

In addition to these features, several roads and paths are shown where they intersect survey lines. Although discontinuously indicated, one or more roads appear to have extended into the vicinity of these farms and probably served to connect them with settled areas to the north.

The survey plat for the township bordering the northern extent of the project area, T26N,R8E, indicates a marked increase in settlement throughout. Approximately 28 cultural features, many of which bear family names, are noted, including improvements, houses, fields, pastures, and a mill. The majority of these features are located along small drainage channels and are at least one mile from the only large streams in the township, the St. Francis River and Mingo Creek. The survey plat also indicates numerous paths and roads connecting the farm plots. Several lakes and sloughs are indicated; however, the area generally appears to have contained fewer wet lowlands than the adjoining townships to the south.

Other maps reviewed were state maps which were compiled during the last few decades of the 19th century. One of these, issued by the GLO in 1886 (Map of the State of Missouri), depicts a completed railroad, the Iron Mountain and Southern Railroad, bisecting the project in the southern part of T25N, R8E. Along the railroad near the west bank of the St. Francis River, the town or village of Ash Hill is indicated; and on the east bank, the town or village of Poplin is shown. Other towns within a 10 mile radius include Asher and Dudley.

Maps dated after 1930 appear to demonstrate a dramatic settlement increase in the region immediately surrounding and including the Wappapello to Crowleys Ridge project. The 1932 Puxico quadrangle map which covers roughly 75% of the project area shows approximately 13 dwellings within or adjoining the 300 foot right-of-way limits. A few small farm roads are shown to extend into the project area, and a major road and railroad bisect the project in Section 28 of T25N,R8E. An unnamed town (Fisk) is depicted in Section 28 containing at least 75 structures as well as 2 churches and 1 school. The vast majority of these appear to be outside of the right-of-way. A rough count of structures located within one mile of the river for this portion of the total project length yielded a density of approximately five structures per square mile, excluding the structures within the town of Fisk. Inclusion of the town yields a density more closely approximating 10 structures per square mile. Also indicated within this one mile radius are numerous roads and small farm lanes, several schools and churches, and one cemetery.

The 1954 General Highway map for Stoddard County indicates approximately eight seasonal dwellings or farm units (in use) within or adjoining the right-of-

way along the east bank of the river. There is no similar map of Butler County, within which the project area along the west bank of the river is located. A count of mapped structures within one mile of the river for a 10 mile length of the project indicates a density of approximately four structures per square mile. Mapped structures include farm units in use and not in use, seasonal dwellings, two schools, one church and one cemetery.

The U.S. Army Corps of Engineers quadrangle maps (1956 and 1965) indicate at least 15 structures, four roads, and portions of the levee bordering or within the project right-of-way limits. Excluding the town of Fisk, the structure density is approximately nine per square mile for the 1965 Puxico quadrangle map which is a significant increase from five per square mile calculated from the earlier (1932) edition of that map. As indicated, the town of Fisk did not grow appreciably during this 30 year interval.

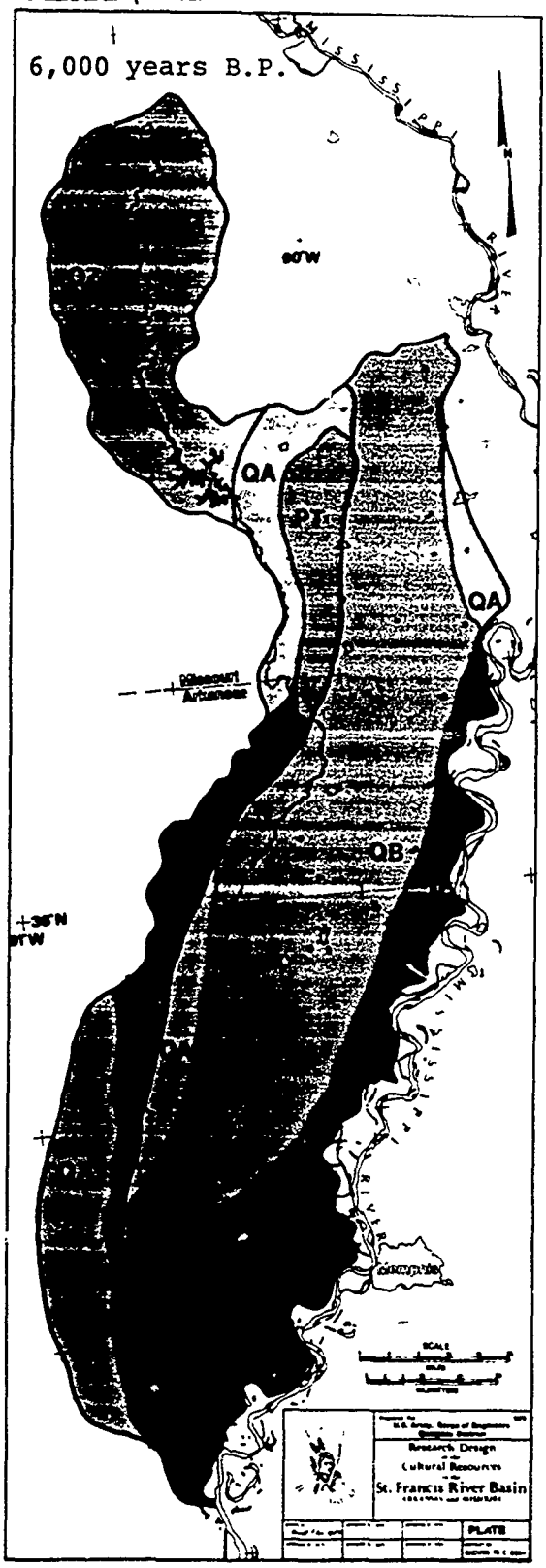
Several general statements concerning the historic resource base in the project area can be derived from this review. Although the earliest maps depict the general area as swampland, more localized survey plats indicate that the area was settled by the mid-19th century. This settlement appears to have been more heavily concentrated to the north of the project limits and decreased noticeably in a southerly direction. Increase in the number of structures during the early 20th century and continuing into the mid-20th century partly reflects the large scale drainage operations, timber clearing, and agricultural development which began in the early 1900's. Consideration of the data suggests that few historic resources might be expected in the Wappapello to Crowleys Ridge project area which date before 1900. The majority of the sites will more likely be products of the 20th century and related to agricultural outbuildings or rural dwellings.

Archaeological Background of the Study Area

The Mississippi River Valley was a major region for developments in aboriginal American culture. The character and location of the Mississippi River and other streams have changed throughout the millennia. The eastward movement of the Mississippi River from a location west of Crowleys Ridge to its present course (Plates E and E2) has probably destroyed many early sites. Occupation of the region began during the Paleo-Indian Period (10,000 B.C. to 8000 B.C.) and continued with varying degrees of intensity through the succeeding Archaic (8000 B.C. to 500 B.C.), Woodland (500 B.C. to A.D. 1250) and Mississippian (A.D. 1250 to A.D. 1600) Periods.

The Wappapello to Crowleys Ridge project area lies on the western limits of the Mississippi River Basin at the edge of the Ozark Escarpment where the St. Francis River descends from the Ozarks and flows along the western flank of Crowleys Ridge in the Western Lowlands (Plate 1). The Western Lowlands have recently been studied during several projects (Price and Krakker 1975: Price, Price et. al. 1975; Price, Price, and Harris 1976; Krakker 1977; B. Smith 1978;

PLATE E2



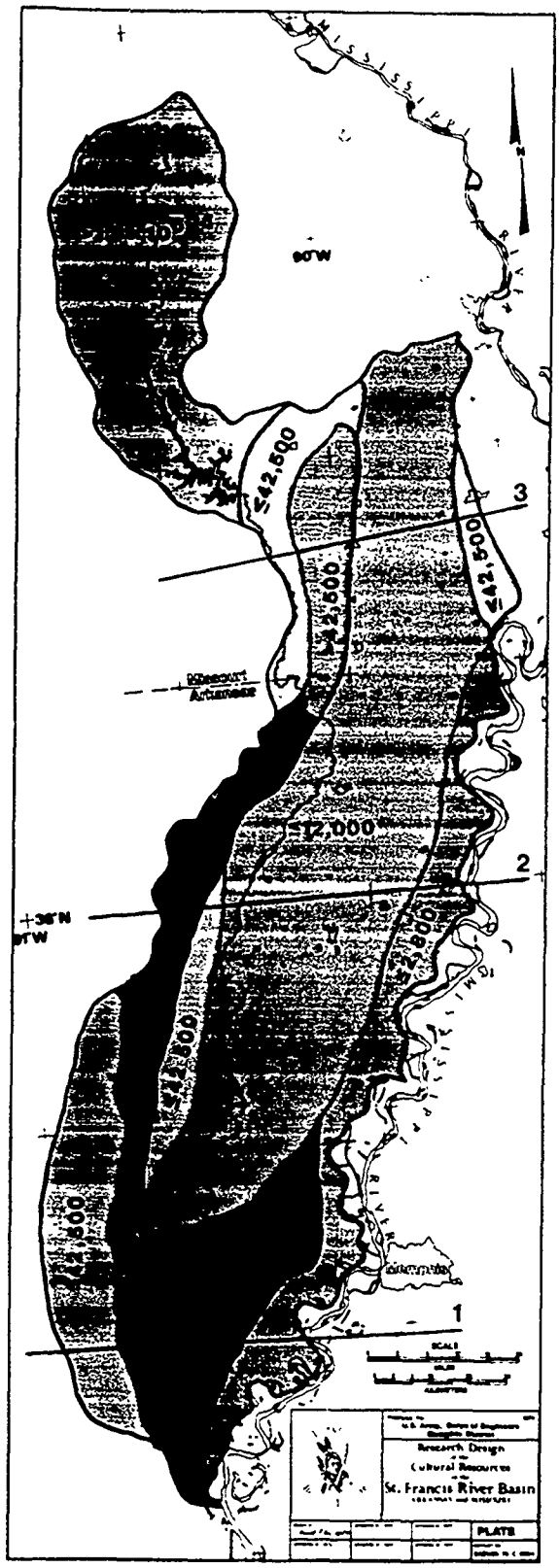


Plate E2. Geological landscapes of the St. Francis Basin at 6,000 years ago and maximum number of years before the present landsurface has been available for habitation. Lines labeled 1, 2, and 3 are recommended geological transect positions.

LEGEND

>1.8 x 10^6yr B.P.		(OZ)	
>42,500	CR	(PT)	
≤42,500	BT	(QA)	
≤25,000	CR	(LS)	
≤12,000	BT	(QB)	
≤6,000	MB	(RC)	
≤2,800	MB	(RE)	

PLATE E

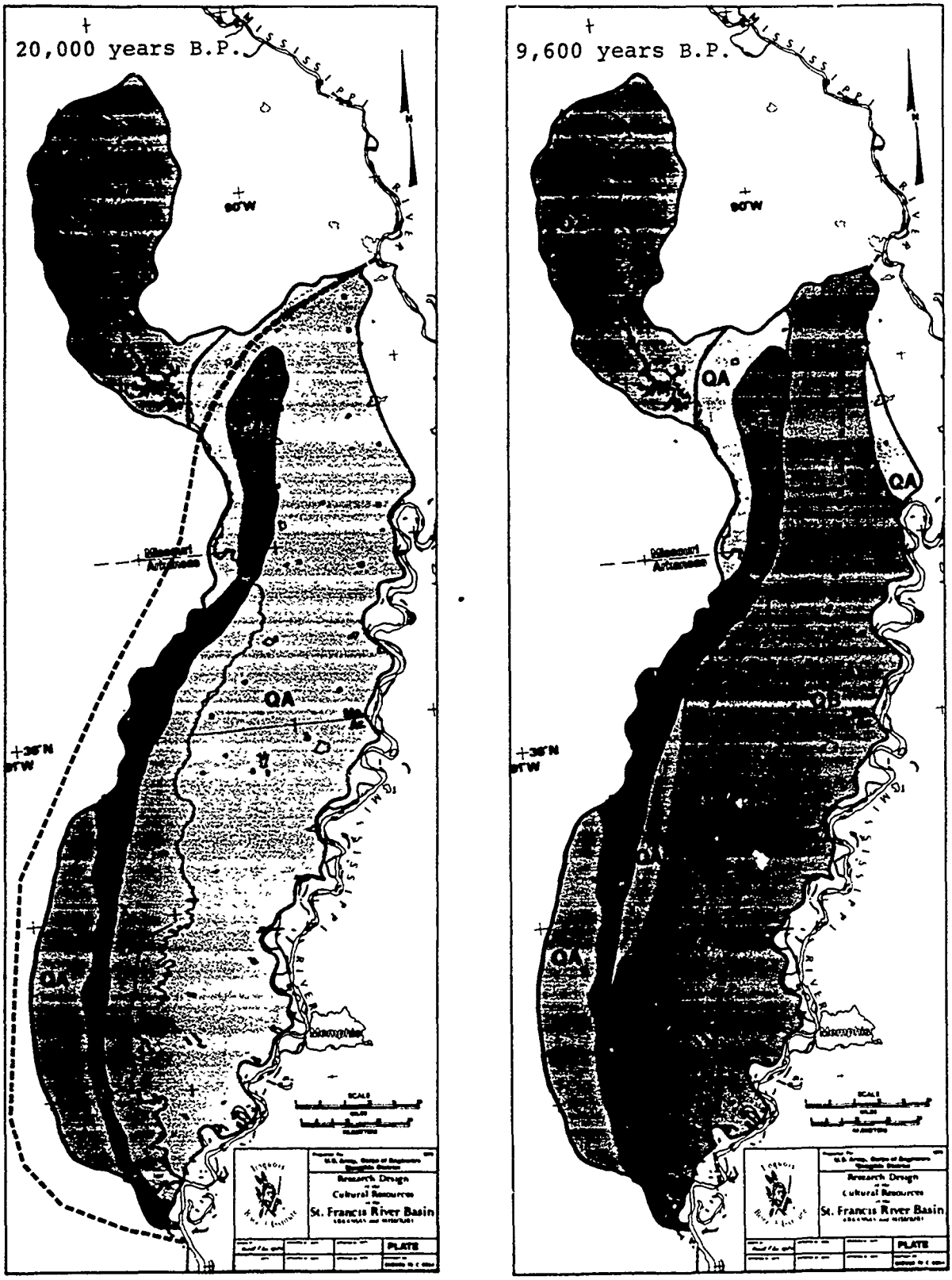


Plate E. Geological landscapes of the St. Francis Basin at 20,000 and 9,600 years ago. The ages given for each land surface indicate the potential period of human habitation in years before the present. The former courses of the Mississippi River are approximate only and indicated by dotted lines.

Iroquois Research Institute 1978a, 1978b, 1978c). The results of these investigations serve as the framework (Table 1) within which the present project will be conducted.

The Paleo-Indian Period (10,000 B.C. to 8000 B.C.), occurring at the end of the Pleistocene, was a time when big game animals were the major source of human food (Jennings 1974). The distinctive fluted points which are diagnostic of this time period have been found in the Ozark Border region but are rare in the lowlands (Price, Price et. al. 1975:44; Price, Price, and Harris 1976:34-35; Price and Krakker 1975:27).

Although evidence for Paleo-Indians is scarce in the general southeastern Missouri area, abundant information exists for the transitional, Paleo-Indian to Archaic Dalton Period (8000 B.C. to 6500 B.C.) (Goodyear. 1974), and numerous studies have been made of this culture which existed when the environment was changing to modern conditions (Goodyear 1974, 1975; Morse 1971a, 1971b, 1973a, 1975a, 1975b; Schiffer 1975; House, Klinger, and Schiffer 1975; Price and Krakker 1975).

A major research problem concerning the Dalton phase is the nature of the settlement system practiced by the hunter-gatherer bands which were located in the Ozark Highlands and on the border of the Western Lowlands.

A study has been undertaken by Price and Krakker (1975) of the Dalton occupations of the Ozark Escarpment region. They used information from surveys of the Little Black River about 26 miles (42 kilometers) southwest of the project area, the Current River Valley on the Missouri-Arizona border, the Upper Little Black Watershed, and the Lower Current River. The results of this study suggest a settlement pattern consisting of base camps occupied during the winter and spring at the escarpment base and base camps in lowland environmental zones occupied during the summer and fall (Ibid.:1935). It is significant to note that Price and Krakker observed no differences in the lithic assemblages of the sites believed to have been occupied at different times of the year (Ibid.:34), suggesting that surface artifact collections are insufficient to differentiate between functionally different sites or components of the Dalton phase and Archaic Periods. This work tends to support Schiffer's (1975) argument that Dalton groups exploited areas that crosscut major physiographic zones (but see Morse 1971a, 1971b, 1975a, 1975b).

The Early Archaic Period (8000 B.C. to 6000 B.C.) represents a full hunting-gathering adaptation to nearly modern environmental conditions. Krakker (1977:64) cites Hardin, Rice Lanceolate, and Cache River points as diagnostic of the Early Archaic Period (Table 1).

The Middle Archaic (6000 B.C. to 2500 B.C.) was a time of gradual transition from the Early Archaic to the Late Archaic. Graham Cave Side-Notched, Rice Lobed, and Jakie Stemmed points replace Dalton assemblages in excavated sequences (Krakker 1977:65), but they are also found in Early and Late Archaic contexts

TABLE 1

PREHISTORIC CULTURAL SEQUENCE OF THE WESTERN LOWLANDS AND THE OZARK BORDER (AFTER KRAKKER 1977)

Time	Cultural Period	Phase Name	Diagnostic Ceramic Traits	Diagnostic Lithics
	Mississippian	Powers	Shell temper	
A.D. 1250				
	Late Woodland Developmental Mississippian	Naylor Scatters	Shell, limestone, and some grog tempers.	Small corner notched and stemmed varieties.
A.D. 900				
		Buckskull	Shell, sand, and limestone temper.	Scallorn, Langtry, Gary, Rice Side - notched
	Woodland			
		Barnes	Sand temper	
500 B.C.		Poverty Point		
	Late Archaic			Smith, Etley-like, Stone Square Stemmed, Table Rock Stemmed
2500 B.C.				
	Middle Archaic			Graham Cave Side Notched, Rice Lobed, Jakie
6000 B.C.				
	Early Archaic			Hardin, Rice Lanceolate, Cache River
8000 B.C.		Dalton		Dalton
	Paleo-Indian			Fluted points similar to Clovis and Folsom.
10,000 B.C.				

(Ibid.). Krakker (Ibid.) has stated that Graham Cave points are found most frequently in the Little Black River Drainage,with Jakie and Rice Lobed forms occurring at the same sites but in less frequent numbers. Preliminary analysis of sites in the Mingo Wildlife Refuge suggests the same patterning of lithic assemblages (Ibid.).

The Late Archaic Period (2500 B.C. to 500 B.C.) left larger and more numerous sites in the St. Francis Basin than any of the earlier periods (Ibid.; Price, Price, and Harris 1976:38). This increase in the number and size of sites may be due partly to new technologies and subsistence strategies. The increased use of heavy ground stone tools and smaller projectile points suggest that such economic changes were occurring in the Late Archaic Period.

During the Late Archaic Period, the Poverty Point culture centered in Louisiana was exceptional in its construction of mounds and the development of a unique artifact assemblage which included microliths, clay figurines, carved and polished stone ornaments, and clay cooking balls and shaped objects (Webb 1977).

The Burkett and O'Bryan's Ridge phases in southeastern Missouri represent Poverty Point related or influenced cultures. G. Smith (1978:Figure 35) located a Poverty Point Period site (23SO294) near the Castor River in his report on the Rivervale site.

The Woodland Period (500 B.C. to A.D. 1250) is commonly defined as the stage when ceramics were widely adopted and horticulture became important to subsistence economics in the eastern forests of North America. Mortuary sites and trading also increased in complexity during this time period (Willey 1966; Jennings 1974).

In southeastern Missouri, contracting stemmed and corner notched points were popular during the Woodland Period (Krakker 1977; Price, Price et. al. 1975; Price, Price, and Harris 1976). Langtry, Cary, and Rice Side-Notched are commonly occurring diagnostic Woodland points found in the vicinity of the project area (Krakker 1977).

The earliest pottery in the region is sand tempered Barnes ware (Phillips 1970; R. Williams 1974). Decorations on this pottery consist primarily of punctates below the rim and occasional pinching and incisions (Krakker 1977:73). Cord or dentate stamping, common to other areas of the Midwest, are not found in Barnes ceramics in the Ozark Border (Ibid.:73; Price, Price et. al. 1975; Price, Price and Harris 1976:41-42).

A study of Barnes intersite variability has been conducted in analysis of the cultural resources of the Little Black Watershed (Price, Price et. al. 1975:115-126). Although no firm conclusions were reached in this study, two different types of Barnes sites appear to exist in the Little Black Watershed: (1) base camps and (2) extractive camps where a few members of the base camp community utilized special resources for short periods of time (Ibid.:125).

In the Little Black and Fourche Creek drainage areas, the Buckskull phase (Price, Price, and Harris 1976:42) has been defined. This phase appears to have occurred circa A.D. 750 to A.D. 900 (Ibid.), after the Barnes phase but before the Woodland-Mississippian Transitional Period (Krakker 1977:74). The Buckskull phase is characterized by shallow, side-notched, triangular projectile points and knives and by shell, sand, and limestone tempered ceramics (Price, Price and Harris 1976:42). Vessel shapes consisted of coconut-shaped bowls and flat bottomed canisters, while surface finishes were smooth with occasional, simple stamped designs (Ibid.).

Later in the Woodland Period, sand tempered Barnes wares ceased to be made in the Ozark Border area (Ibid.). Regional diversity is indicated by the fact that Barnes sand tempered ware continued to be manufactured on the Malden Plain, while Baytown clay tempered pottery was introduced into the ceramic inventory of the Eastern Lowlands and the lower St. Francis River Basin area (Ibid.).

Two transitional phases between the Woodland and Mississippian (A.D. 1250 to A.D. 1600) Periods have been defined for the Fourche Creek and Little Black areas (Price, Price, and Harris 1976:45-46; Price, Price et. al 1975:56-57; Krakker 1977:74).

The Scatters phase is the earlier of the two phases. While stone tools are similar to Buckskull lithics and settlement patterns and subsistence strategies appear to resemble Woodland adaptations, shell tempered ceramics indicate possible development of a Mississippian culture (Price, Price, and Harris 1976:45-46). Scatters phase ceramics consist of canister, hemispherical, and "flower-pot" shapes. Sherds of this pottery have been found in the lower Current River Valley (Ibid.:45), along the Cache River in Craighead County, Arkansas (House 1975a:32), and throughout much of the Western Lowlands of northeastern Arkansas (Morse 1969:22).

The later developmental Mississippian phase along the Ozark Border is the Naylor phase, described by Price, Price et. al. (1975) for the Little Black drainage area. The Naylor phase is characterized by small corner notched projectile points, expanding base stone drills, and a variety of shell tempered ceramics (Ibid.:56). Pottery styles generally consist of jar forms with flat bases and cord marked exteriors, interior and exterior red filming, outflaring rims, and a lack of appendages and surface motifs (Ibid.). Site locations for this phase are primarily along streams, are often on large Archaic middens, and both small campsites and large villages are known to have Naylor phase materials (Ibid.).

The Naylor phase is similar to the nearby Hayti phase (Marshall 1965:190), the Big Lake phase (Morse, n.d. cited in Price, Price et. al. 1975:57), and the Malden Plain phase (S. Williams 1954:275). These phases represent an early developmental period of Mississippian culture. The work of Price, Price et. al.

(1975) has suggested that cultures of the Ozark Border activity participated in the development of Mississippian culture, rather than passively receiving outside Mississippian influences.

During the Mississippian Period (A.D. 1250 to A.D. 1600) some of the most complex cultures of prehistoric North America existed in the St. Francis Basin. Large villages with pyramidal earthen mounds, plazas, and dense resident populations were founded. Social organization and religious life were complex, and corn agriculture provided the economic base for artistic achievements in pottery and other media. Social organization and site sizes and functions were hierarchically organized.

Cyrus Thomas (1894) was one of the first archaeologists to study the Mississippian mounds. In his report on these explorations, he discussed the Peter Bess "Settlement" site on the west bank of the Castor River in southeastern Bollinger County (Ibid.:170-171). The site consisted of an almost square earthen embankment encompassing four mounds within its 12 acre area. Ashes and great quantities of sherds suggested an intense or long term settlement. Mr. Bess, the farmer working the area, told Thomas that he had uncovered two stone coffins while plowing one of the mounds. Beside the skeletons in the graves, Bess found "a gourd-shaped vessel, ornamented with red stripes and filled with lead ore so pure that he afterwards made bullets from a part of it" (Ibid.:171).

The major Mississippian substage which has been defined for the Ozark Border area is the Powers phase (Price 1973; B. Smith 1973; Price, Price et. al. 1975) in the Little Black River drainage. This phase lasted for only 50 to 100 years circa A.D. 1300 (B. Smith 1978:7). Smith (Ibid.) has suggested that during the Powers phase the settlement pattern in the Western Lowlands of southeastern Missouri consisted of a single ceremonial center (Powers Fort), a series of smaller fortified villages (i.e., the Turner and Snodgrass sites), and an undetermined number of smaller sites (Ibid.:7). Powers phase ceramics exhibit a wide variety of forms, sizes, and decorations. Jars, flaring rim bowls, incurvate bowls, effigy bowls, necked bottles, hooded water bottles, and stirrup vessels are common forms. Sizes vary greatly in jars and flaring rim bowls, and decorations include incising, punctating, noding, bossing, and painting (Price, Price et. al. 1975:60).

In the Cache River Basin, a Mississippian Period phase, the Wilson phase, has been tentatively named (Morse 1975a:193). Neeleys Ferry wares shaped into jars with small strap handles and lugs, necked and hooded bottles, and bowls are found in Wilson phase components. Matthews Incised sherds occur infrequently, red filming is present in small amounts, and Sequoyah and Scallorn points are common at these sites (Ibid.). Morse dates the Wilson phase to the Early Mississippian Period, circa A.D. 1000-1100 to A.D. 1200-1300 (Ibid.:194).

About 38 kilometers (24 miles) southwest of the project area, B. Smith (1978) has recently conducted a study of a small Powers phase site on the edge of the Ozark Escarpment in the Western Lowlands. He suggests that this site, the

Gypsy Joint site, was the homestead of a nuclear family and that it was occupied on a year-round basis for the short span of about three years (Ibid.:191-193). A variety of materials including food remains, artifacts, features, and the floors and structural fragments of two houses were found during Smith's investigation of the site. His report on this site offers general guidelines for Mississippian small site characteristics in the southern Missouri region.

Krakker's (1977) survey of the Mingo National Wildlife Refuge is located 16 kilometers (10 miles) from the project area. The five percent survey of the Mingo National Wildlife Refuge covered approximately 1,035 acres and resulted in the documentation of 62 sites, 44 of which were discovered during the 1977 survey (Krakker 1977). The Bluff Road Indian Mound and the Flatbanks site, which are both located in the Mingo Refuge area, were placed on the National Register prior to the 1977 survey. Both of these sites were found to contain midden deposits which suggest intensive activities or lengthy occupations at these locations. The Bluff Road site, located at the base of a ridge by the Mingo River, was occupied during the Archaic and Early Woodland Periods. The Flatbanks site is within a lowland hardwood swamp and may have been occupied by hunting groups, perhaps to obtain swampland resources.

The occupations of sites inventoried during Krakker's survey ranged from the Late Paleo-Indian Dalton Period through the Woodland Period. The identified occupations consisted of two Early Archaic (and a tentative third), 15 Middle Archaic, 16 Late Archaic, and 19 Woodland (Ibid.). Eleven sites contained Archaic, Late Archaic, and Woodland components. Although all of the physiographic zones in the project area contained indications of prehistoric utilization, the natural levees and braided stream remnants were the zones with the highest intensities of occupation (Ibid.).

Krakker compared the Mingo project data with information obtained in a survey of the Little Black Watershed in the eastern Ozarks (Price, Price et. al. 1975). Using quantitative methods, he found that the Mingo area had more Middle Archaic and fewer Woodland components than the Little Black area (Krakker 1977:189). Krakker also found some differences in the artifact assemblages of Mingo and Little Black lowland sites and slight indications of differences between lowland and escarpment sites within the Mingo project area (Ibid.:196). The differences in artifact assemblages in different environmental zones suggest different site functions and possibly different exploited resources for the sites in these areas.

Krakker (1977:196-197) suggests that the absence of Mississippian Period occupations in the Mingo Refuge area may be due to the fact that there are only a few small areas of sandy, well drained soils suitable for the agricultural economy which was the basis of Mississippian culture. Better soils were available in the Little Black area where the Mississippian Period Powers phase has been defined (Price 1973; B. Smith 1973).

In 1938, the University of Missouri surveyed the areas of the St. Francis River and its tributaries which were to be flooded for the creation of Wappapello Lake in Wayne County, a little more than eight kilometers (five miles) from the northern end of the project area (Berry, Wrench, and Chapman 1940). A total of 546 sites were discovered. The majority (406) of these sites were considered to be campsites (Ibid.:7). Only two of the 132 mound sites discovered during the survey yielded evidence of human activities. The rest of the mounds are believed to have been naturally formed (Ibid.:9,11). The University of Missouri team stated that the majority of ceramic sites they discovered during the Lake Wappapello survey were "chiefly of the Woodland pattern" (Ibid.:31). The descriptions (Ibid.:8) of recovered ceramics suggest that they collected sherds of Barnes and Buckskull wares. Some tentative evidence of Mississippian occupations was found in the form of stone "discoidals", small projectile points, and some ceramic features.

The Castor River, Item 1 survey, 40 kilometers (25 miles) northeast of the current project area, (Iroquois Research Institute 1978c) discovered eight prehistoric site components. Of these components, five were of unknown chronological periods (23S0419, 23S0420, 23S0430, 23S0434, and 23S0436), while three (23S0424, 23S0431, and 23S0432) were assigned to a cultural period.

Site 23S0424 (Ibid.:45-46) yielded a Graham Cave-like point, suggesting an Early or Middle Archaic occupation; Barnes Plain and Cord Marked sherds, indicating a Woodland occupation; and Neeleys Ferry Plain sherds suggesting a Mississippian occupation.

Site 23S0431 (Ibid.:48) contained debitage from a number of different lithic sources which include Crowleys Ridge, Crescent Quarry, Mill Creek, Pitkin, Burlington, and Oolitic varieties of chert as well as chalcedony and quartz. The large amount of fire cracked rock and absence of ceramics suggest an Archaic Period occupation at this site although it is possible that it was occupied during later or earlier periods.

Site 23S0432 on the Castor River (Ibid.:50) also contained a wide variety of cherts and other lithic raw materials. A St. Charles and an Elora projectile point, discovered during the test excavations, suggest a Late Archaic to Early Woodland occupation for this site.

Krakker (1977:197) mentioned a large Mississippian component a few miles east of the Mingo survey area along the Castor River on the margin of Crowleys Ridge. This evidence, as well as the relatively close Peter Bess "Settlement", suggests that Mississippian occupations may be found along the better drained areas of river margins (B. Lewis 1974) in the St. Francis drainage.

In summary, the expected nature of the prehistoric resources in the Wappapello to Crowleys Ridge project area may be outlined. The discovery of Paleo-Indian remains is unlikely as evidence for this period has been rare in the Ozark Border region. Dalton artifacts may be found, however, as the general region is rich in the remains of that culture. Dalton materials have been found

throughout the Western Lowlands (Morse 1971b; Price and Krakker 1975; Krakker 1977) and the Ozark Uplands (Price and Krakker 1975).

Early Archaic and Middle Archaic sites may be located in the project area. Graham Cave points, diagnostic of these times, were found in the Mingo National Wildlife Refuge project area (Krakker 1977:64) and in the Castor River, Item 1 project area (Iroquois Research Institute 1978c:46). Late Archaic sites are abundant in the general vicinity of the project area. It is likely that sites of this period will be found during the survey of the Wappapello to Crowleys Ridge project.

Since several Woodland Period phases (Barnes, Buckskull, Scatters, and Naylor) have been defined in the sourrounding region, it is reasonable to expect that sites of this period will occur in the project area.

The potential for Mississippian Period sites in the project area is low. Mississippian components were not found in either the Mingo project (Krakker 1977) or the Castor River, Item 1 project (Iroquois Research Institute 1978c). However, as Mississippian Period sites are known for the general region (Krakker 1977:197), evidence of temporary, small group occupations may possibly be found.

Historical Background of the Study Area

The area in which the Wappapello to Crowleys Ridge project is located was used by man in the New World long before the arrival of the Europeans.

However, when the first French visitors arrived in the area either late in the 17th or early in the 18th century, the cultures which DeSoto's men had encountered were no longer present. French explorers passing down the Mississippi River in the mid-17th century would have had no reason to move this far from the great river, but by the early 1700's there were French adventurers penetrating the area in search of precious minerals. Although no gold or silver was found, abundant deposits of lead near the headwaters of the St. Francis soon attracted a number of French miners to that area after 1720. It is possible that the first Europeans to pass through the immediate project area were French prospectors.

After 1763, however, any European who journeyed through would have been in the dominion of Spain as a result of the treaty wherein France deeded her trans-Mississippi territories to Spain. Since the Spanish were already established in Texas, it was necessary for officials to cut a trail from St. Louis to Natchitoches. Much of the so-called "El Camino Real" probably followed an established Native American trail along the Ozark escarpment southwestward from the Mississippi River, across the upper St. Francis River at Indian Ford, and onward to Spanish Texas.

Spain sought to create loyal settlements on her borderlands as a buffer zone to defend against the expansionistic Americans. Among those groups who responded to this invitation were not only some of those land hungry Americans, but also groups of Native Americans fleeing the constant pressure of warfare and land grabbing on the frontiers which they had shared with the United States. Small bands of Delawares and Shawnees crossed the Mississippi to accept Spanish lands near Cape Girardeau and perhaps at other locations close to the project area (Weslager 1972:358-93). A band of Shawnees and Delawares reported to number almost 400 lived for a time on Apple Creek in Stoddard County, 30 miles from the St. Francis River (Forister n.d.:8). The presence of these villages was only of passing significance since the Louisiana Purchase by the United States in 1803 brought additional numbers of American settlers across the Mississippi.

Many people who crossed simply wished for a place to build a house and land to support their families. Ideally, they hoped for enough land for themselves and their children. Because there were more attractive and drier lands to the north and farther south, this area of Missouri was slow in gaining population.

Unfortunately, a cataclysmic natural phenomenon occurred in 1811-1812 which blackened the reputation of the entire area of Missouri and Arkansas along the Mississippi River south of New Madrid (Figure 1). The powerful New Madrid earthquake shook the entire Mississippi Valley to such an extent that people did not stop talking about it for years. Travelers who were in the region at the time wrote about the upheaval in great detail. Later travelers who wished to keep up the sale of their books commented on the earthquake and reported on its manifestations which could still be observed. To many uncritical observers, southeastern Missouri and northeastern Arkansas thus were the "Sunk Lands," places unfit for human habitation. Indeed the entire Mississippi and Ohio Valley was a demanding place for farming, given the rugged conditions and the annual outbreaks of malarial fevers; but, like the Great American Desert, the Sunk Lands may in part have been the victims of bad press.

Despite the obstacles, farmers were so eager for new lands that, for $1.25 an acre, they would seek arable plots even if they were surrounded by rather inhospitable lowland areas. Thus, people would have come into the project vicinity in search of farm land before the days of extensive drainage projects or levee systems. Early settlers probably came from the north along the road from Fredericktown and Greenville or from the east via the Spanish road running from St. Louis to Natchitoches. By 1848, therefore, surveyors noted two cultivated fields in T24N,R8E in Sections 11 and 29, and five farm plots just east of the St. Francis River in T25N,R8E in Sections 4, 5, and 16 in the immediate vicinity of the project area (General Land Office Survey Plats 1848). Isolated though those farmsteads may seem to the farmers-pioneers of the mid-19th century, isolation was a way of life. If supplies were needed, a ride on horseback along the trace to Bloomfield would secure them.

Along the roads from Cape Girardeau and Fredericktown came groups of settlers. Some of them were part of the European migrations which crossed the

American Mercury.

HARTFORD, CONNECTICUT, PUBLISHED BY ELISHA BABCOCK, PRINTER OF THE LAWS OF THE UNION.

[VOL. XXVIII.] WEDNESDAY, FEBRUARY 19, 1812 [NO. 1422]

"NEW MADRID EARTHQUAKES"

1811-1812

Eyewitness Accounts

Geologists, historians, and anthropologists have speculated that local physiography and prehistoric resources in the study area were affected by the series of earthquakes starting in mid-December, 1811 and extending to March, 1812.

These hypotheses are particularly well presented by Morse and Morse in their Zebree archaeological report (1977:4-4).

Charleston, Jan. 24.

Earthquake.—Yesterday morning, at fifteen minutes after nine o'clock, another shock was felt in this city. The vibratory motion was more severe than any we experienced last month, and continued for one minute. The pavements in several of the streets are cracked, by the loosening of the cement; and a three story brick house in King street, belonging to Mr. Brownlee, has received very considerable injury. The walls are cracked from the top to the bottom, and the wooden work and plaistering, in the inside, are split and broken. Many persons in different parts of the city were sensible of a shock at eight o'clock in the morning. Several families left their beds. Both these concussions were unaccompanied with any noise.

From Liberty Hall.—[Cincinnati, Ohio]

The Earthquake.—An interesting letter from a gentleman of respectability, dated at Chickasaw Bluffs, December 21, states, that the first shock of the earthquake occurred at 30 minutes past 2 o'clock, in the morning of the 16th. the same time it seems to have been felt in the Atlantic states and in this country. That shock was followed during the 16th and the following night by nineteen others; on the 17th there were three, and the following night several others; on the 18th there were seven shocks, and several through the succeeding night; on the 20th there were five, and on the 21st, when the letter was written, the earth was still trembling. The first and second vibrations, and that between 11 and 12 o'clock on the 17th, were the most violent.

The effect of these shocks appear to have been of the most alarming kind. The barge commanded by the author of the letter was anchored in 2 1-2 fathoms water, about 17 miles below New Madrid, or 87 below the mouth of the Ohio. The boat was acted on by the water in a manner that excited a supposition of her being grounded, but upon sounding, they could find no bottom. The current increased to three times the velocity it had the preceding evening; the crew of a boat at the shore testified that the river rose six feet in a short time; and that no spot on the land was to be found that was not (as they expressed it) "giving." Two flat-bottomed boats that were laying at the shore were destroyed. One was broken entirely to pieces, and the other overtured—the crew saved themselves.

At the second shock, millions of trees that were imbedded in the mud in the bottom of the river, suddenly had one end elevated to the surface, rendering the river almost impassable. At the same time the banks were shook into the river in large masses. Upon passing the Little Prairie, the inhabitants were found to have all fled to the high lands. It was stated by some hunters near the Bayon river, that the ground was cracked into innumerable fissures, and large quantities of water were issuing out of them. An island just above the mouth of the Bayon river, was extremely agitated, and seemed to require but little to sink it. The lakes which lie in the valley of the Mississippi, were discharging large quantities of water into that river; and the water fowl of that region were observed throughout the whole of the 16th to keep constantly on the wing.

The writer of the letter had not heard from any place farther down the river than the Chickasaw Bluffs, about 176 miles below the mouth of the Ohio; but his letter closes with an expression of the deepest anxiety respecting the country nearer the Gulph.

We are, however, credibly informed that a letter has been received from New Orleans, dated the 20th of December, which is entirely silent as to the earthquake.

The Earthquake.—We continue to receive accounts of this phenomenon of nature from all quarters. The following letter from a subscriber informs us of being felt on the Ohio; and the subjoined article, from a Charleston paper, appears as if its effects having extended as far south as that place. It will be observed that in Charleston and this place, (Washington) the shocks were simultaneously felt; or, at most, within fifteen or ten minutes of the same moment; whilst, on the Ohio, the shock was felt an hour earlier than at either this city or Charleston. If any thing is to be inferred from this circumstance, it is, that the progress of the subterranean impulse, which caused the shock, was from west to east. Were we to give the reins to imagination, we might conjecture, that the vast and almost unexplored region between the Mississippi and Pacific, the source of the cause of this tremendous convulsion.

Coshocton, Ohio, Jan. 23d, 1812.

MR. EDITOR,

This morning, at seventeen minutes past eight o'clock, a severe shake of an earthquake was felt in this place. It lasted nearly a minute; it shook so as to nearly half empty a bucket, standing on the floor, full of water; and the river being froze over, it caused the ice to crack considerably. A stone chimney in the house of col. Williams in this place, seven by five feet square, solid & well built, was so severely shaken as to cause it to crack several places; and one or perhaps more brick chimneys in this place have been considerably injured by the shock. I have been informed that several houses in the neighborhood of this place were so shook that much of the chinkin dropt out; and the commotion of the trees and bushes was so great as to cause persons in the woods to observe the phenomenon. The shock was succeeded by a thick haze, and several people were affected with giddiness, although the air was quite serene at the time of the shock. The course of the above shock was from S. W. to N. E. nearly.

A. JOHNSON.

Figure 1

Atlantic between 1820 and 1850 to escape famine and revolution in Europe. Such movements in the project area by some groups from Germany are noted in locations labelled "German settlements" which appear just north of Poplar Bluff on an 1860 map of Missouri. Indeed, a line drawn from Cape Girardeau southwest through German settlements like New Hamburg westward to the "German settlement" lands belonging to settlers named Martin Acher (var. Aacher, Ascher) and P. Rof substantiate the presence of settlers from western Europe (General Land Office Survey Plat 1848). As indicated on a map of the state compiled in 1886, Acher had been anglicized into Asher which had become the name of a local community. By 1965 it had changed to Asherville. The indicated presence of, and known farming practices of these European settlers might explain why a 20th century geographer would write:

> In the northern part of the St. Francis Basin farm practices, in general, are similar to those in the corn belt, and in some sections the cultural landscape, showing fields of wheat, corn, and pasture, and neatly arranged homesteads with shady yards, barns, and, in many cases, windmills, strongly reminds one of that region (Bratton 1930:374).

Although those German settlements in southern Missouri were not as substantial as those in St. Louis or on the lower Missouri River, they were numbered among the 113,768 German-born residents of Missouri in 1870 (van Ravenswaay 1977:6).

During the Civil War, the project area was crossed more than once by Confederate and Union troops as well as by groups of irregulars. The road from Bloomfield to Poplar Bluff which passed through the project area was no doubt used by Confederate raiders operating as far east as New Madrid, or as they retreated into Arkansas across the St. Francis River at Chalk Bluff. When Federal troops penetrated the area to attack Poplar Bluff, they, too, passed along this road. The deep division of loyalties among the inhabitants seems supported by reports concerning the opposition given to Federals attempting to operate in the area and by rumors that the Federal commander at Bloomfield intended to surrender his command rather than be overrun by the surrounding enemy (Official Records XXXIV,1:872-875; Ibid. XXII,1:707-721).

Although there were a number of small farming hamlets in the project area and its immediate environs, substantial acreage was not being farmed. According to an 1867 description of Missouri, Butler County had 350,000 acres of tillable land, 100,000 of which was free from inundation and suitable for cultivation. The remainder would be useful only if drained. About Stoddard County the author wrote:

> ...this county, as well as Dunklin, New Madrid, Pemiscot, and Mississippi, suffered considerable damage by the earthquakes of 1811-1812, and upon many maps numerous large lakes are represented as covering much of the surface of these counties. This, is, in the main, quite erroneous...According to the latest estimates, not more than one-fourth of this county is bottom land, and nearly all tillable. All the

> county is heavily timbered (except where cultivated) with all kinds of oaks, ash, poplar, hickory, black walnut, etc. (Parker 1867:26).

In this description lay two keys to the future growth of the area: rich timber resources and the need for drainage projects. The demand for timber in the United States was increasing at a pace equally as frantic as that of other raw materials such as iron and coal. Everything from kitchen pails to railroad ties was made of various kinds of wood. In 1881, a representative of the Himmelberger Lumber Company of Logansport, Indiana, began securing stumpage rights from land owners. Four years later this company merged with the Charles Luce interests which controlled over 200,000 acres of timberland. Several other lumber companies also operated profitably in the area until after World War I (Ogilvie 1967:103-105).

Once the timber was cut it had to be moved out of the area to market and the only feasible method was by railroad. Thus in tandem with the timber interests came the railroad developers who extended existing lines into the area from the north and east as well as constructed short connecting lines throughout the region. By 1873, Poplar Bluff could be reached by two railroads, the Iron Mountain from the north and the Cairo and Fulton from the Mississippi River to the east. Railroads served the timber industry by shipping staves, ties, heads, lumber, and other wood products to any market in the United States (Ibid:32-67). There were of course problems with some early railroad construction. Entrepreneur Louis Houck was accused of building "peavine" railroads on which he occasionally bridged a creek "by felling two trees and laying rails across these" (Ibid:54).

Once the timber resources began to near depletion, both the railroads and the lumber companies with land interests began turning their attention toward ways of attracting settlers to the now cleared, but undrained, lands. Drainage projects could not be completed overnight, but in the meantime the land owners decided to advertise. In 1873 the Cairo and Fulton Railroad, now the Missouri Pacific whose line crosses the project, published a 24 page pamphlet entitled Lands in Arkansas from Missouri to Texas. 1,926,400 Acres of Agricultural, Timber and Mineral Lands, at Low Prices and on Easy Terms of Payment. The Line of the Railroad, the Center of the Land Grant. Description of the Lands, Statistics of the Counties, and General Information for Persons in Search of Homes (Cairo and Fulton 1873:i).

Despite the extensive claims of such advertisements, the project area and the counties surrounding it could not realize their agricultural potential without an extensive and expensive series of drainage projects (Ogilvie 1967:105-137). Between 1885 and 1938, the slow process of constructing the drainage systems finally resulted in the creation of drainage districts which incorporated "2,215,000 of the 2,230,000 acres in the Southeast Missouri Lowlands" (Ibid.:113).

As the lowlands were drained, more and more acreage was devoted to intensive cultivation of cash crops. Especially after World War I the widespread planting of cotton moved northward to escape the boll weevil which had infested thousands of acres in the lower South. As Table 2 indicates, only 6,254 acres of cotton were planted in Stoddard County as of 1920, but by 1930 that figure had more then tripled. Although the figures for Butler County in Table 3 are less dramatic, they are nonetheless compelling: 5,100 acres in 1920 compared to 11,070 in 1930, or more than double. After World War II, however, an even more marked transition took place with the shift to soybeans. In Stoddard County, farmers raised only 7,306 acres of soybeans while they harvested 22,500 acres of cotton in 1930. Today, that county's cotton production has risen to 32,031 acres, but soybeans have skyrocketed to 224,446 acres. The main reason is simply economic: if 224,446 acres were planted in cotton today, the earnings would be $62,844,850 while the same area planted in soybeans would yield $67,333,800, or a difference of $5,000,000 in one year (Morgan 1979:A8). Although the shift is resisted by cotton gin owners who control land which they insist be planted in cotton, many are worried about how long it will be before they have to end the cotton business.

A review of the census data for Stoddard County reflects a period of steady growth from 1870 to 1920 (Table 4). Between 1920 and 1930 there was a decline in population brought on particularly by the agricultural depression of 1920 (Current et. al. 1967:551). Although a similar decline did not occur in Butler County, the population increase was much less than during the previous decades (Table 5). A dramatic increase in acreage under cultivation from 1910 to 1920 followed by a substantial decline between 1920 and 1930 also occurred in these counties. War in Europe had brought so much prosperity to American farmers that they cleared and planted new acreage as fast as possible. So long as the price stayed high, all was well; but, when the bottom fell out of the wheat market, farmers stopped planting. Table 2 illustrates this roller coaster phenomenon for Stoddard County, from acreage in wheat production 1910 (15,530), to 1920 (56,044), and 1930 (12,290).

As the agricultural economy recovered during the late 1930's, however, the populations of the two counties rose until they peaked in 1950. By that time, since all suitable agricultural land had been cleared and put into cultivation and had become increasingly mechanized, the need for agricultural laborers was steadily less (Ogilvie 1967:385-386). Since 1950 there has been a continuing decline in the countys' populations, a factor in part influenced by the switch from cotton to soybeans, a crop which can be grown, cultivated, and harvested almost completely by machine.

In assessing the historical potential of the project environs, although the area was relatively isolated in the mid-19th century from the perspective of an east-west transportation axis, it was not along the north-south axis. While it is doubtful that any artifactual material relating to historic Indian groups or French or Spanish visitors may be found, it is possible that materials relating to some of the pioneer farmsteads established between 1840 and 1860 may be encountered. Likewise, ferry sites as well as other river crossing sites could

TABLE 2

ACREAGE IN AGRICULTURAL PRODUCTION

STODDARD COUNTY, MISSOURI

YEAR	CORN	WHEAT	COTTON	SOYBEANS	TOTAL
1910	75,872	15,530	8,239	0	99,641
1920	98,670	56,044	6,254	0	160,968
1930	91,330	12,290	22,500	7,306	133,426
1940	80,240	21,880	44,210	11,636	157,966
1950	93,300	8,200	50,000	86,400	237,900
1960	65,200	27,600	42,800	155,000	290,600
1970	23,341	67,797	32,031	224,446	347,615

TABLE 3

ACREAGE IN AGRICULTURAL PRODUCTION

BUTLER COUNTY, MISSOURI

YEAR	CORN	WHEAT	COTTON	SOYBEANS	TOTAL
1910	30,320	662	2,807	0	33,789
1920	43,850	11,853	5,101	0	60,804
1930	32,920	1,630	11,070	4,028	49,648
1940	37,000	2,800	13,220	5,103	58,123
1950	38,500	800	18,000	12,800	70,100
1960	27,000	14,300	18,900	68,000	128,200
1970	25,000	12,350	19,275	87,530	144,155

U.S. Bureau of Census of Agriculture Reports, 1910-1970.

TABLE 4

POPULATION STATISTICS

STODDARD COUNTY, MISSOURI

RACE	1850	1870	1890	1910	1930	1950	1960
Black	56	70	135	24	1,692	1,643	2,006
White	4,221	8,465	17,192	27,780	25,570	32,799	27,484
TOTAL	4,277	8,535	17,327	27,804	27,262	34,442	29,490

TABLE 5

POPULATION STATISTICS

BUTLER COUNTY, MISSOURI

RACE	1850	1870	1890	1910	1930	1950	1960
Black	N.A.	21	596	1,372	1,539	2,252	2,500
White	2,459	4,275	9,568	19,247	22,152	35,449	32,134
TOTAL	2,459	4,296	10,164	20,619	23,691	37,701	34,634

Sources: Ellis 1929; Ogilvie 1967:529.

reveal data about transportation, economics, and customs during the years of their use. If the present roadbed for the Missouri Pacific is not identical to the old Cairo and Fulton Railroad, location of the older roadbed might yield artifacts relating to 19th century railroading. Along the roadbed might be found data related to camps used by the construction gangs or by gandy dancers hired to maintain the railroad. The roadbed itself might also reveal the standards to which the Cairo and Fulton was originally built. Along the railroad also might be found evidence of the logging industry such as loading platforms, saw mill sites, and camps for the lumberjacks, sawyers, and drovers who handled the oxen which dragged the logs to the mill or railroad.

In summary then, given the close orientation of the area to certain time periods and specific economic developments, the expected historic potential should include artifacts relating to: (a) dwelling and farming units dated from the earliest period of settlement into the present century; (b) transportation sites such as fords, ferries, roads, and railroads from 1840 to the present; and, (c) economic sites such as those connected with the early development of the lumber industry, post World War II saw milling, and drainage projects. Isolated artifacts related to Civil War bivouacs might be found, but they are of minor significance to the immediate project area.

Architectural Background of the Study Area

Despite the existence of written information pertaining to the architecture of the St. Francis River Basin, most works fail to deal specifically with building in the region as an independent cultural expression. The researcher, then, must initially consult comparatively general writings which provide the basis for a characterization of St. Francis architecture. The following paragraphs indicate the variety of sources consulted.

Histories of American architecture often include comments on the Mississippi River Valley which may be cautiously applied to St. Francis development (Morrison 1952; Gowans 1964). State and local histories prove helpful in providing socio-political context as well as identification of regional landmarks (Houck 1909; Works Progress Administration 1941; Miller 1948; Ogilvie 1967; Kniffen 1971). These sources, however, are ultimately of limited use. Effective Euro-American settlement of the St. Francis Basin occurred, for the most part, long after the French and Spanish colonial building activity which is much emphasized in American architectural histories. In addition, both types of sources focus on formal or "high-styled" architecture; that is, those few buildings which trace their origins to an architect's drafting table. Such sources fail to recognize structures which have only traditional needs and construction patterns as blueprints. The latter, called folk or vernacular buildings, built from memory with local materials according to time-tested designs, comprise a major building component of the St. Francis River Basin.

The study of American vernacular architecture is a recent phenomenon. Inspired by work conducted in Great Britain, especially by Ronald W. Brunskill (1970;1977), and the pioneering efforts of cultural geographer Fred B. Kniffen of Louisiana State University (1936;1965), scholars are now addressing such problems as rural home type identification, the spatial planning of agricultural complexes, and the origins of design elements. Many findings in the field of vernacular architecture serve to illustrate the building tradition of the St. Francis Basin.

Publications issued by the United States Department of Agriculture and land grant schools such as the University of Missouri School of Agriculture, are also fruitful sources for researching the architecture of farming areas like the St. Francis Basin (Fenton 1917; Wooley 1930; USDA 1939; Anderson 1969; Midwest Plan Service 1973). It must be remembered, however, that these publications contain only suggestions and merely reflect rather than document building in the St. Francis region.

Cultural resource investigations conducted by Iroquois Research Institute in the St. Francis Basin have significantly added to the architectural information available for the region. Three resultant reports are of particular importance for evaluating building in the Wappapello to Crowleys Ridge project area. A research design for predicting cultural resources in the St. Francis River Basin (Iroquois Research Institute 1978a) included architectural surveys of two Missouri towns, in addition to archival research, field survey, and data analysis. One of the surveyed towns, Morehouse, is located approximately 30 miles southeast of the Wappapello to Crowleys Ridge project area. The Castor River, Item 1 and Ditch 24 cultural resource survey reports (Iroquois Research Institute 1978c;1978b) also deal with areas close to the Wappapello to Crowleys Ridge project. The architectural sites of both completed projects have yielded information of specific importance to the definition and assessment of building in the Wappapello region.

Beginning more than 10,000 years ago, the St. Francis River Basin became inhabited by the peoples now collectively called Native Americans. The building forms and methods employed by the many and various native groups evolved according to their technological and socio-economic development. While a discussion of prehistoric architecture rightly belongs within the realm of the archaeologist, the probability of a cultural exchange between the Native Americans and the earliest Europeans in the St. Francis region should be noted.

Continually displaced westward from their original eastern seaboard homes by Euro-American expansion, the Delaware and Shawnee entered southeastern Missouri near the close of the 18th century (Price, Price et. al. 1975:135, Figure 15). The traditional architecture of the native groups was based on a structural system of arched pole frames covered with readily available materials such as bark, skins, or thatch (Swanton 1928:688).

The building patterns of the Native Americans were probably emulated by the first Europeans in the region. The activities of the French and Spanish in the Missouri Bootheel during the late 18th century were largely confined to hunting, trapping, and trading (Price, Price et. al. 1975:140; Kniffen 1971:24). The pole frame shelters of the Native Americans were well suited to such occupations. It is likely that the Europeans adopted such easily constructed, expendable structures for their essentially transient economic ventures. Native American settlements have been discovered which contained log structures, a result of ever-increasing European contact (Krakker 1977:86,91).

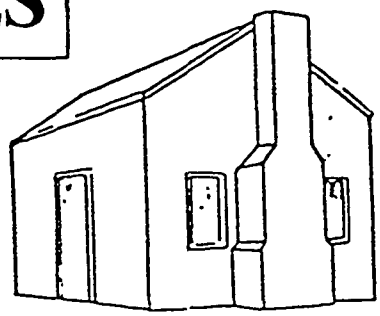
By the early years of the 19th century, the Euro-American presence in Missouri had become permanent due both to Spanish encouragement of American settlement in the Bootheel and to the start of American ownership as a result of the Louisiana Purchase of 1803. (Ogilvie 1967:12; Kniffen 1971:42). Kentuckians and North Carolinians, among others who had entered the region, introduced northern European methods of log construction into the area. The log house perfectly satisfied the needs of frontier life. Its heavy, load-bearing walls formed a reasonably permanent structure. Economy of construction was assured by the abundance of natural materials and the need for only the simplest, most portable tools (Montell and Morse 1976:9). The log house was a flexible form, lending itself to both additions and modifications. Finally, and perhaps most significantly, the log house served as a link with tradition, a reassuring and comfortable sight in an unfamiliar land.

The single pen log house (Figure 2) is generally recognized as the basic vernacular house type of the American South (Wilson 1974:65). A one room dwelling of roughly square dimensions, averaging 20 feet to a side, the single pen house never exceeds one and one half stories in height. A gable roof, with ridge parallel to the entrance side and board sheathing, crowns the structure. Blocks or piles of stone compose an open, elevated foundation designed to cool the house during hot, humid summers. A chimney, originally constructed of woven sticks and clay and protected by a roof overhang, appears at either gable end (Montell and Morse 1976:9-16; Wilson 1970:21).

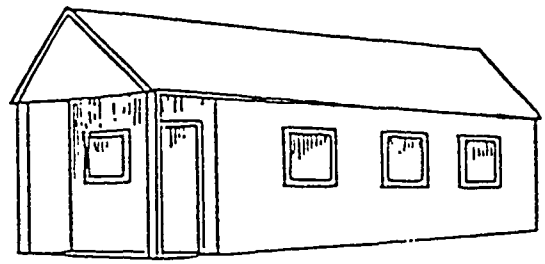
The walls of the single pen are built up of squared, split, or round logs stacked horizontally and variously joined or notched at the corners. The spaces between the logs are filled with a daubing of mud or clay and straw or wood chips and clay chinking. Diagonally placed stones are also used to fill the interstices. The single pen possesses at least one door and one window, the openings for which are created by directly cutting out sections of the log walls and finishing the rough sides with boards (Condit 1968:20-21).

The single pen log house closely resembles the one bay house of Tidewater Virginia, especially in dimension, and, ultimately, the small houses of rural Britain (Wilson 1970:24). It is a form which represents the blending of Swedish-Germanic wood construction methods and British spatial design. The single pen house both widely distributed and enduring in the southern United States is the basic unit from which all other domestic vernacular structures are composed.

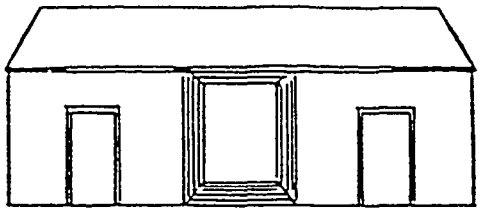
STRUCTURE TYPES



Tne Single-Pen House



The Shotgun



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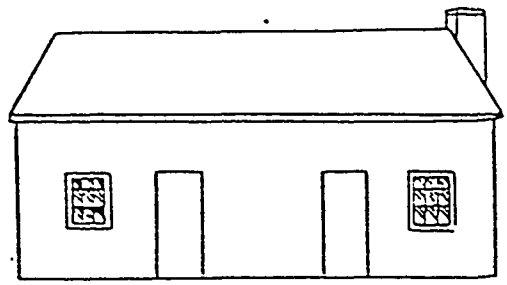

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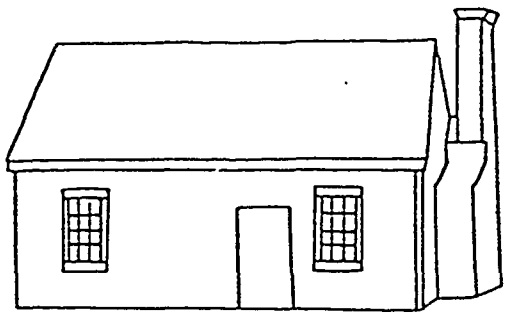
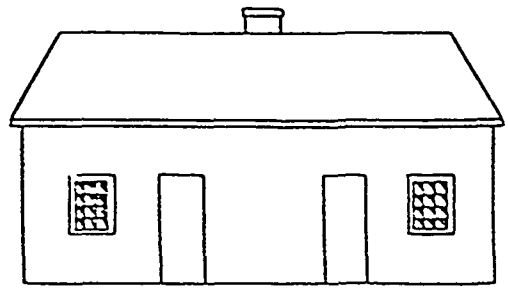
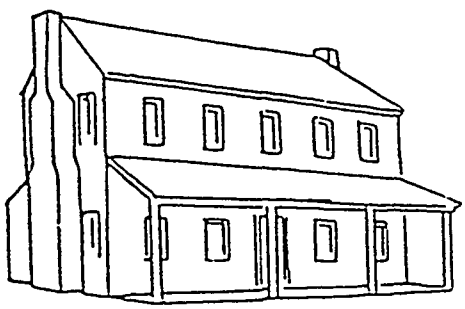


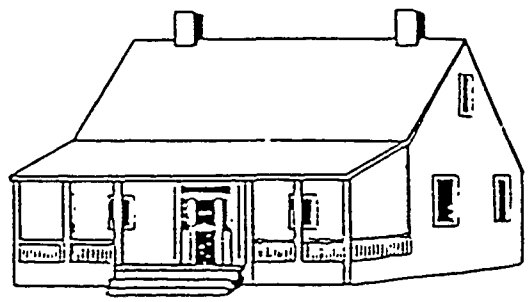
The Hall and Parlor House



The Saddlebag



The Southern I House



The Georgian Plan. One Story House

Figure 2. The sketches above illustrate eight housing types found in the St. Francis River Basin. The houses belong to the vernacular tradition of the region. Neither designed by architects, nor copied from pattern books, the houses were built by the people who would use them. The housing types are products of the enthno-geographic origins of the builders, and are a function of the climatic and economic conditions of the river basin.

Settlement of the Missouri Bootheel during the first half of the 19th century occurred slowly, impeded by swampland, exaggerated reports of the New Madrid Earthquake, and the diseases endemic to the region. Nevertheless, isolated, single-family farmsteads were established in the area and the diversification of domestic vernacular architecture observed throughout the South followed in time (Kniffen 1971:25,50).

Many occupants of single pen houses eventually felt the need for greater living space. Since the medieval era, enlargement in the English housing tradition had been achieved horizontally, that is, by the addition of an interior space to a gable end (Wilson 1970:71). The double pen house is essentially two single pen houses brought together under a common gable or hipped roof. Each pen retains its own entrance and the single chimney is located at one exterior end. A variation on this solution results when a chimney end serves as the juncture point for the two units. The central chimney house thus formed is called a "saddlebag" (Glassie 1968:78, 102-105). When two roughly equal and square units are joined by a common roof, yet separated by an open passageway of eight to 12 feet in width, a "dogtrot" house is produced (Wilson 1974:67). A dogtrot, built in 1833 near Clines Island has been preserved in the Bloomfield (Missouri) City Park. Each of the double houses was eventually built as an integral type, with both parts constructed at the same time (Figure 2).

As settlements began to prosper, frame construction appeared in the Bootheel. This method of building is based upon a structural system in which a "skeleton" with an external protective covering bears the weight of the building. The heavy frame, medieval in origin, is constructed of hewn, squared timber elements, connected and strengthened by the careful joining of parts and diagonal bracing. Wooden pins or iron nails secure the joints. A dwelling found in the Castor River, Item 1 project area (Iroquois Research Institute 1978c) appears to have hand hewn framing elements. The establishment of saw mills acted as an incentive for frame building. If economically possible, most settlers quickly exchanged their log houses for framed ones. The heavy framed house offered greater structural stability, more effective protection from the elements, and a degree of social sta[illegible]

When pre-cut, dimensioned lumber came to be produced by the saw mills, another type of wooden frame was made possible. The balloon frame, an American innovation of the 1830's and still the principal method of wooden construction today, was revolutionary in its use of dimensioned lumber, machined nails, and few or no heavy bracing members. The balloon frame was well suited to the needs of new settlement areas since its assembly required a minimum of carpentry skill, unlike the heavy frame, and could be achieved by the labor of a single man, unlike the log house (Condit 1968:43-44). Both the heavy and balloon frames are provided with weatherboards; horizontally nailed overlapping wooden planks which protect the exterior walls. A gable roof with ridge parallel to the entrance side is customary and is covered with wooden shingles.

Four additional vernacular house types are important to the development of architecture in the St. Francis River Basin (Figure 2). The simplest of the four, the medieval English "hall and parlor" house, possesses an asymmetrical plan of two rooms and may be of frame, brick, stone, or log construction. The addition of interior partitions created a central passage between the two rooms which was served by a doorway in each long side of the structure. This arrangement was readily adopted and duplicated throughout the South (Glassie 1968:64-67).

The central passage which allows the circulation of air throughout the house became a popular feature in both formal and folk architecture of the American South. To the dogtrot and hall and parlor forms may be added what Henry Glassie has termed the "Georgian Plan, One Story House Type." The house consists of a broad central hall with flanking pairs of rooms to either long side, the internal arrangement characteristic of the formal Georgian style. Symmetry is the rule on the exterior as well. A pair of interior brick chimneys appears in the gable or hipped roof. It is a folk housing type associated with economic success (Glassie 1968:109-112).

The central passage motif appears yet again in the design of a two story, one room deep dwelling, a type found from New England to the Deep South and the Midwest. Dubbed the I-house by Fred Kniffen in 1936 for its occurence in Indiana, Illinois, and Iowa, the dwelling type is three or more bays wide and has a centrally placed front door. As with all folk types discussed thus far, the I-house has a gable or hipped roof with a ridge paralleling the entrance front. There exist many subtypes; not all have a central passage, though its presence indicates a common type, and chimney placement varies considerably. The I-house is a type built by the more prosperous inhabitants such as the slave-owner Henry Miller, whose plantation house, built around 1843, still stands in Bloomfield.

The final vernacular house type to be considered does not conform to the pattern established by those previously described though it appears with equal frequency, especially in the Deep South. If the two front entrances of a double pen house were shifted to its gable ends, a "shotgun" house would result. Room after room may be added, one behind the other, often producing a structure of extreme length, but always one room wide. The shotgun may be found in both rural and urban environments. The unusual configuration of the shotgun house has led to studies establishing an African origin for the type (Vlach 1975:29-38).

The basic domestic vernacular types just described are all subject to variations. The addition of a front porch is perhaps the most common refinement of the basic house types, yet another architectural feature inspired by a hot climate. Porches, especially those of I-houses and Georgian plan houses, often display decoratively turned balusters and columns. L- or T-shaped additions, enclosing a kitchen and dining area, are also frequently observed on folk houses. A one story, three bay dwelling with an L addition was recorded in the Castor River, Item 1 project area (Iroquois Research Institute 1978c). Rear shed-roofed additions are also much employed.

Housing types may be disguised by the closing off or conversion to windows of exterior doorways. The owners of log houses often felt compelled by prevailing fashion to cover the exterior of the structure with weatherboards. Similarly, the breezeway of a dogtrot house might be boarded over. The decorative products of power-driven tools, such as jig-saw trim, often embellished otherwise stark gables and doorways.

Identifiable design variations exist for a number of vernacular house types. The chimney placements and presence of a central passage for I-houses have been noted. I-houses may be further altered by the addition of a central, two story, projecting portico on the front facade. This motif was popular with antebellum slave holders, as well as others to this day, for whom the Greek Revival houses of the big planters in the Deep South symbolize a desirable mode of life. The front facade of an I-house may also be articulated with one to three Gothic gables, another borrowing by the vernacular of a high-style feature.

Two late 19th century variations of vernacular house types should be mentioned at this point. The gable or hipped roof of the one story Georgian plan house came to be virtually replaced with steep hipped or tall pyramidal roofs. Gables and porches also increased in number (Glassie 1968:112). A variation on the saddlebag theme is specifically associated with the tenant farmers or sharecroppers of the South. In the new form, the central chimney or flue services stoves in the two front rooms instead of fireplaces. The customary two doors remain, almost always protected by a shed-roofed porch. Rear kitchen additions are common. The tenant saddlebag is always of frame construction and one and one half stories in height (Montell and Morse 1976:26). An example of this type was observed in the Castor River, Item 1 project area (Iroquois Research Institute 1978c).

Publications for the agricultural population, such as Progressive Farmer, increased in number in the last half of the 19th century. The active distribution of pamphlets and periodicals by the United States Department of Agriculture and the Agricultural College of the University of Missouri introduced new materials, methods, and building forms to the St. Francis region. Numerous trade and industry publications became increasingly aware of the farm market. The vast amount of new information with which the St. Francis Basin was bombarded could not help but bring about an improvement in farm living. The architecture of the area, however, was threatened with loss of its folk qualities.

New materials, such as concrete, were extolled by several publications including "Barns, Sheds and Silos" (Anon. 1918) and "Construction with Surface Bonding" (Haynes 1974). The strength and imperviousness of concrete recommended its use for barn floors, all foundations, and silos. The pole frame shed or barn, inexpensive and simple to construct, yet structurally strong, was adopted in this century. The pole frame consists of posts or poles planted directly in the ground to serve as a foundation, wall system, and support for the roof (Midwest Plan Service 1973). It is, incidentally, a structural system basically identical to that of the Native Americans who once inhabited the St. Francis River Basin.

Beginning in this century, St. Francis Basin farmers could obtain building plans and working drawings for farm houses, silos, many kinds of barns, and even erosion control systems from a number of sources. The Agricultural Extension Service of the University of Missouri College of Agriculture maintained a list of plans which, in 1917, included 18 barn types and were available for five cents a sheet (Fenton 1917). The Midwest Plan Service, a cooperative effort of regional agricultural colleges, was established in 1933 and is active to this day (Giese 1933). The Engineering Division of the USDA has made available the greatest variety of plans and construction directives, many of which have often been duplicated in agricultural circulars (Wooley 1930: USDA 1939).

In the Wappapello area, most farmsteads were probably located on crests of land, hills, or other elevated areas. The choice was dictated by the characteristically frequent flooding of the region. Proximity to a usable water supply, however, also was of prime importance. It has been demonstrated that Euro-Americans tended to choose the same habitation sites as members of the Mississipian culture and continued to do so until alteration of the land by drainage control structures began in the 20th century (B. Lewis 1974:32).

In his study of farmstead arrangement and design, Trewartha (1948) discovered that the average cotton belt farmstead contains fewer buildings than those outside the region. The buildings, moreover, are not large. A typical farm of the St. Francis region might be oriented about a dwelling with its long dimension or entrance side parallel to the principal road or waterway. The shotgun house, of course, is placed perpendicularly. Associated structures are arrayed about the main house; the barns and animal pens are always located downwind from the house. The dust from dry, unpaved roads often encouraged the set-back of houses. This arrangement was demonstrated by three farm complexes in the Castor River, Item 1 area (Iroquois Research Institute 1978c:42,53).

The types of structures most likely to appear on St. Francis Basin farmsteads are the storage sheds and variants such as corn cribs, hen houses, and swine shelters. The storage shed figures as probably the single most numerous structure type found in the region (Ibid.:Table 19). Constructed of roughly sawn lumber, the shed possesses a flat, single slope or gable roof with an entrance, generally, in its short side. A variety of entrance locations and interior partitions may adapt the shed for animal habitation.

The barns of the St. Francis Basin are essentially enlarged sheds, often with open sides or "pull-throughs" for machinery. Originally somewhat small in dimension and constructed of logs, early 19th century St. Francis barns served mostly to store corn and wheat. Translated into frame, the barns increased in size and variety of use. Shed additions to one or both long sides of a gable roofed barn are common features. The resultant structure is characteristic of the region and is called a broken gable barn. A good example of the type (Plate 3) was found in the Ditch 24 project area (Iroquois Research Institute 1978b).

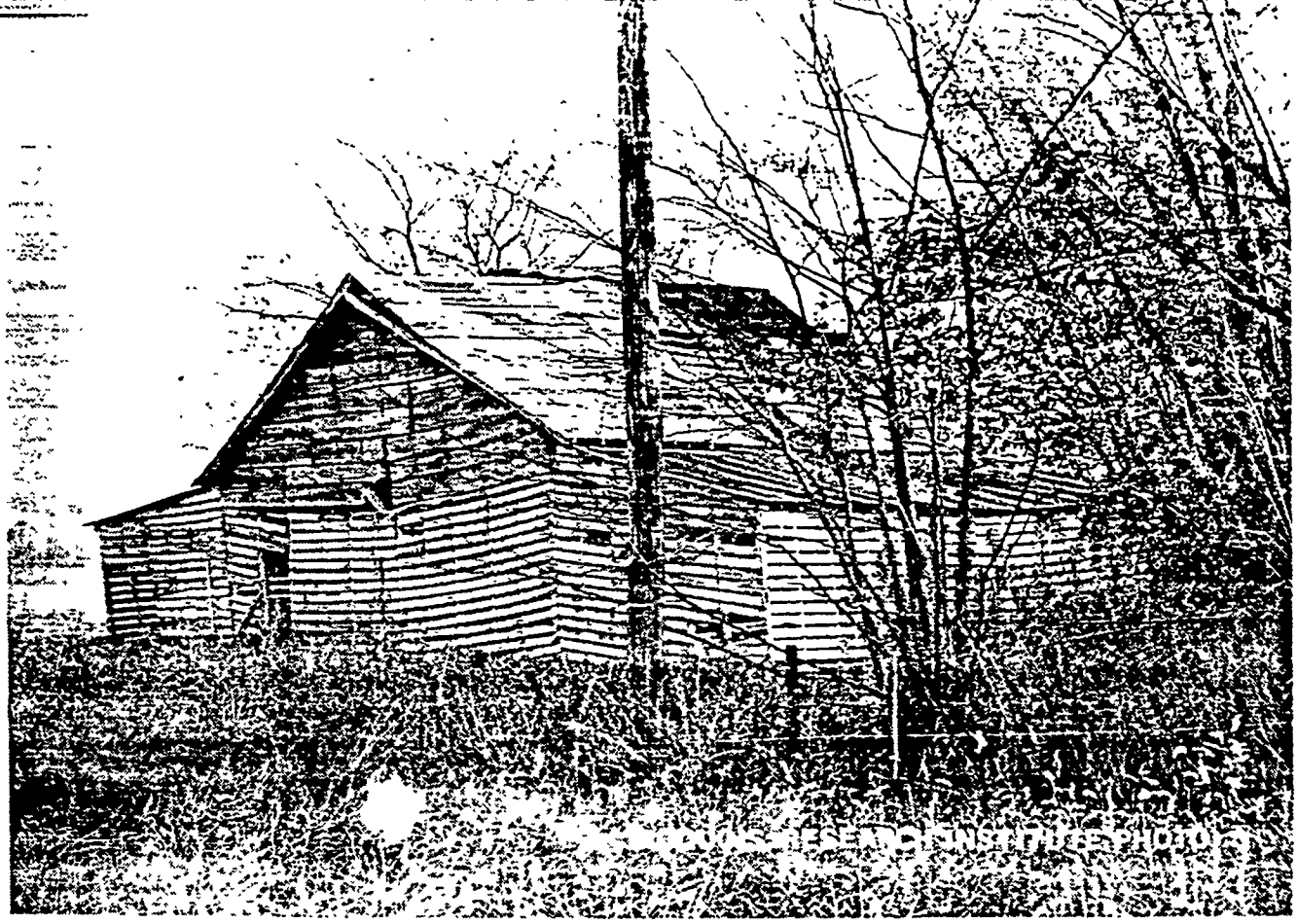


Plate 3. As the double pen house was a response to a need for greater domestic space, so the broken gable barn, illustrated above, met similar demands in agriculture. The broken gable barn takes its name from the change in roof pitch which occurs when one or two shed additions are attached to the long sides of a gable-roofed structure. Enclosed shed additions may accomodate animal stalls or storage cribs. When constructed with open sides, the additions may provide shelter for farm machinery. The widely spaced, horizontal board siding of the illustrated barn suggest its use as a well-ventilated hay barn. No. 1201-4A

The precise extent of the influence exerted by agricultural publications has not been established. That outside, non-folk architectural influence is indeed a reality in the St. Francis Basin is suggested by the concrete silos and Dutch gambrel-roofed barns present today. It may be stated, then, that from the last half of the 19th century, two attitudes in building existed simultaneously: the vernacular and what might be called the "imported" or popular. This mixed architectural climate was not confined to agricultural areas, but may be observed in the towns and communities which punctuate the St. Francis farmlands.

As late as the 1850's, the Wappapello to Crowleys Ridge area could not be characterized as densely populated or economically progressive. Wheat, oats, corn, and, to a lesser degree, cotton had been chosen by some as cash crops, but general subsistence farming occupied the majority of the inhabitants. The industrial component of the area was made up of saw mills and flour mills (Ogilvie 1967:25-28). Despite its agrarian character, however, small towns and communities were established in the Wappapello area in the first half of the 19th century, the most notable of which is the Butler County seat, Poplar Bluff, founded in 1850.

The buildings of the early communities were most likely distributed on either side of a "main street." Domestic structures could not have been numerous, since the majority of the inhabitants farmed land, even those merchants with "urban" interests. The mills, small stores, and churches which usually inspired the creation of a town were probably of a heavy frame construction, built with a gable end facing the street as the entrance front, and with a potential height of two stories. Commercial establishments often had front porches. Generally speaking, no great differentiation between domestic and commercial structures occurred in the St. Francis Basin until the arrival of new materials and architectural concepts via the railroad.

Railroads entered the Bootheel in the late 1850's, but the proliferation of both extensive and short span tracks was a post-Civil War phenomenon. The tremendous growth experienced by the logging industry from the late 19th century to the second quarter of the 20th century was the major impetus for the establishment of the railroad lines (Kniffen 1971:56). Many towns were created along the new transportation routes such as Dexter, Morehouse, Fisk, Ash Hill, and Dudley. The railroad thus inspired intensive urban building activity and also introduced the necessary modern materials and techniques. The public buildings of the lumber towns clearly reflect the architectural impact of the railroad.

The typical public and commercial buildings of the late 19th and early 20th century towns may be illustrated by examples in the town of Morehouse, about 30 miles east of the Wappapello to Crowleys Ridge project. Morehouse, established about 1880, was a logging boom town and the junction of two major railroad lines, the present Missouri Pacific and the St. Louis-San Francisco.

The commercial structures of Morehouse generally conform to the gable or short end entrance and two story height scheme of the early 19th century. The buildings, however, have been grouped into uniform "blocks" or attached to existing structures creating rows of connected units (Plate 4). Another new feature was the "false front" or parapet, that is, the vertical extension of a front facade above the height of a basically box-like building. The majority of commercial buildings in Morehouse are of brick though wood or concrete block, plain or rusticated, are also used in the St. Francis Basin.

Decorative treatment of commercial structures is confined to the front facade, often the only side of the structure visible from the street. Morehouse facades are articulated with decoratively formed or molded brick, the varying placement or patterning of brick, and the use of cast iron fixtures, especially framing the entrances (Plate 5). Elsewhere in the region, commercial facades were often crowned with bracketed cornices and further enhanced by applied ornament of wood, iron or tin, generally of Italian Renaissance inspiration. The appearance of such factory made architectural elements shortly after the Civil War was a boon to the small town merchant who desired both economy and style.

The formal Italian Renaissance and even the Romanesque revival styles were adopted for commercial buildings in the St. Francis Basin, largely due to the

Plate 4. Commercial buildings of the late nineteenth and early twentieth centuries were organized into rows or "blocks," unbroken walls of store windows and patterned brick. The individual buildings of a commercial block were often free standing, either directly abutting or separated by functional alleys. Neighboring structures might share a bearing wall. All three methods of placement may be observed in the above view of Beech Street in Morehouse, Missouri. The term "commercial block" is also assigned to a large building divided into separate units, while maintaining uniformity of facade design. An example of such a block, containing two units, stands in the foreground of the above photograph. No. 1220-3

Plate 5. The patterning of brick into string courses, inset panels and projecting cornices is a decorative practise much employed for commercial structures of the late nineteenth and early twentieth centuries. The iron store fronts, lintels and awnings evident in the above photograph were undoubtedly selected from a factory catalog, transported from perhaps St. Louis or Memphis by rail, and incorporated into a locally built structure. Patterned brickwork and the use of cast iron building elements helped to introduce features of formal architectural design into remote areas of the country. The use of cast iron elements and the extensive decorative brickwork in the commercial buildings of Morehouse, Missouri, such as those above, are vestiges of the town's turn of the century prosperity. No. 1220-7

marketing of prefabricated building elements. The churches, banks and, especially, the courthouses and city halls of the St. Francis Basin were the buildings most likely to receive the attention of an architect. For example, the Morehouse City Hall, most likely built during the early years of this century, is a hipped roof, brick structure resting on a high basement (Plate 6). The symmetry and decorative detail of the American Georgian Revival style are here combined with a "monumental" entrance portal of Romanesque inspiration. The City Hall is a notable example not only of the creative eclecticism present in American architecture of the late 19th and early 20th centuries, but of the care taken with the design and site locations of public buildings in the most rural of areas.

Yet another structure once seen in Morehouse is an indication of conditions in the Wappapello Region. Elevated sidewalks of Cypress planks were essential for the oft-flooded Morehouse streets (Miller 1948:74,79). The extensive drainage and flood control programs which began around the First World War changed the character of southeast Missouri: the newly drained lands of the Bootheel were found to be rich and fertile, so agricultural activity reached an efficiency and productivity never before possible.

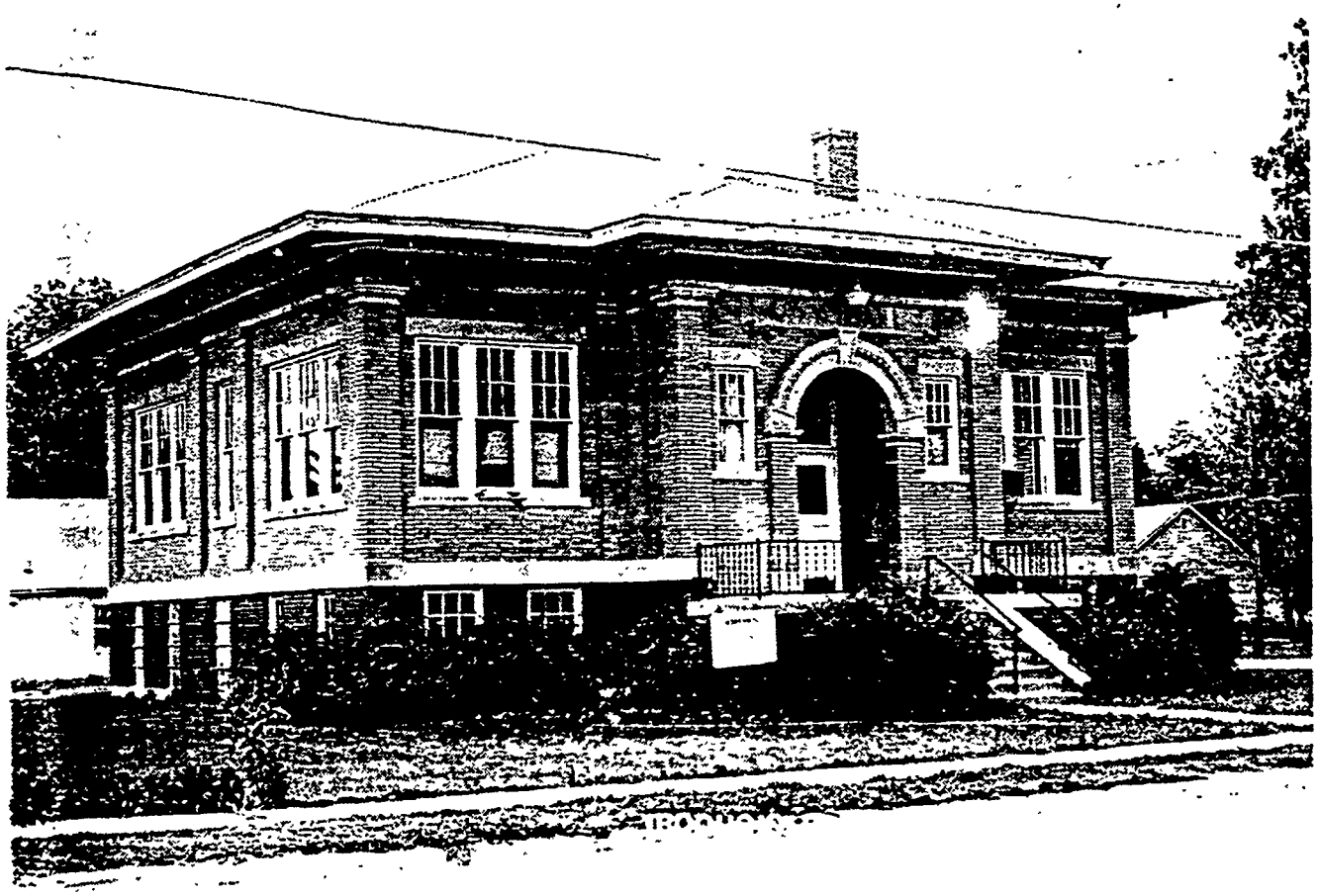


Plate 6. The City Hall of Morehouse, Missouri not only reflects the eclecticism of American architectural design around the turn of the century, but exemplifies the attention paid the public buildings of the St. Francis River Basin. The Georgian symmetry of the building has been combined with an entrance portal of Romanesque inspiration. The Morehouse City Hall is constructed of brick, a material rarely used in domestic construction but of prime importance for commercial, governmental and ecclesiastical building.

No. 1218-14

As the 20th century progressed, so did the availability of building materials. Log and heavy frame construction ceased to be wise choices when cheap lumber, concrete, brick, corrugated sheet metal, and asbestos shingles were so easily obtained. Two popular house types began to dominate, especially in and near towns. The bungalow of the 1920's was a one story structure with a broad overhanging gable roof supported by brackets. The ridge of the roof was perpendicular to the short or entrance front which was usually provided with a porch (Plate 7). The porch was often roofed independently, producing an elevation of two juxtaposed gables (Whiffen 1969:217). The ranch house was a product of the post-World War II housing shortage. Adopted from western U.S. building forms by commercial developers, the ranch house soon invaded nearly all states in the country. One story in height with a gable roof ridge parallel to the long or entrance front, the ranch house in the Wappapello region appears to be the chosen home of the prosperous farmer (field observation April 1979). In spite of the popularity of new forms, folk house types, especially the saddle bag, may be observed today in the St. Francis Basin which are less than 50 years old.

The research design prepared by Iroquois Research Institute (1978a) for the St. Francis River Basin has much to contribute to a study of the Wappapello to Crowleys Ridge area. The usefulness of the architectural survey conducted in

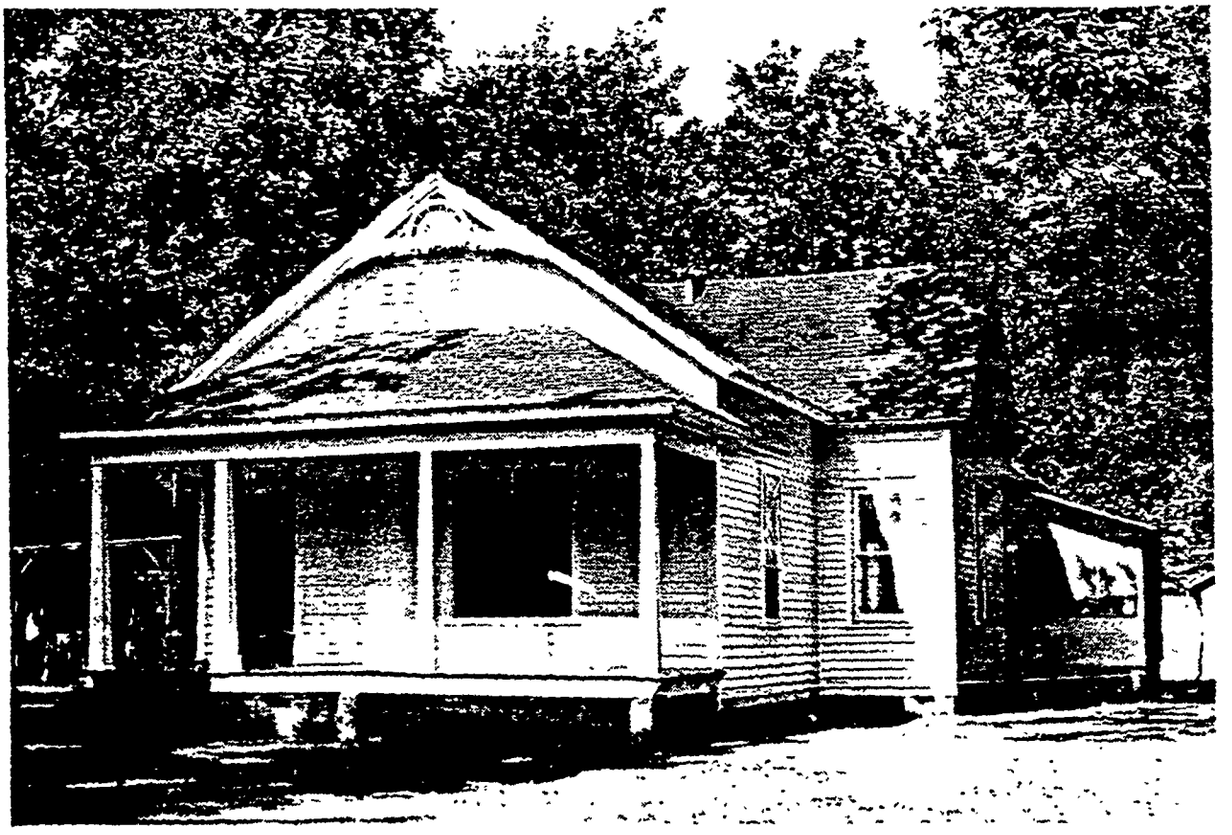


Plate 7 . The broad gable of the front facade, low height, porch and decorative simplicity of the basic bungalow were sometimes enhanced by ornament and various spatial additions, as in the Morehouse example above. Another variation concerns the relative dimensions of the house type. The bungalow is basically square, but may be constructed with three to five bays in depth. Consequently, such houses have been termed "linear bungalows." The linear bungalow is one of the most frequently occurring house types in the St. Francis River Basin today. No. 1117-22A

Morehouse, Missouri has already been indicated. Formulation of a workable predictive model for architecture was hampered by the inadequate or non-existent recording of structures which existed for the St. Francis Basin; that is, by a simple lack of data. The research design recognizes the need for a regional methodology of data collection and provides a structured and comprehensive system to meet that need. It is a system which is above all, replicable, insuring the effective comparison and subsequent analysis of data.

Findings of the Wappapello to Crowleys Ridge project will augment the architectural data base of the St. Francis Basin. The greater the number of buildings studied, the more precisely defined the architectural context of the area. Regional types and variations can be more readily identified and a framework for the evaluation of St. Francis architecture can be securely established.

The presence of formal architecture in the project area is highly unlikely, especially as there are no towns or cities, with banks, town halls, office buildings and the like, within the project boundaries.

Agricultural structures including farm houses, barns, and assorted sheds and pens should be expected to predominate due to the economic character of the area. Concrete block for walls and foundations, the balloon frame, corrugated sheet metal roofing, and asbestos shingles for both roofs and siding will appear as the most common building materials. Stone may appear with a greater frequency than is usual in the southern reaches of the St. Francis Basin due to the proximity of the Wappapello area to mountainous regions such as the Ozarks. The majority of structures will most likely date from the period after the success of drainage projects and consequent agricultural expansion; that is, after World War I. Based on Iroquois Research Institute's (1978c) study of the Castor River, Item 1 project, most structures may be expected to postdate World War II.

RESEARCH DESIGN

One of the more significant advances in the state of the art of cultural resource management (CRM) has been the increased attention paid to the development and explicit use of research designs in conjunction with reconnaissance, inventory, and mitigation projects. While the use of research designs has not become a universal practice in CRM projects, there is an expanding acceptance among CRM professionals that carefully formulated research designs are prerequisite to successful applied research and to valid assessments of cultural resource significance (Goodyear, Raab and Klinger 1978; Iroquois Research Institute 1977; Raab and Klinger 1977).

The kinds of research questions asked in conjunction with a particular CRM project depend on the scope of a project and on the state of knowledge of the particular project area; that is, the kinds of questions that have already been

answered by previous investigators. The primary CRM objectives of this project are: (1) to locate and inventory the cultural resources within the area that may be affected by the project, (2) to evaluate the identified resources with respect to their eligibility for inclusion in the National Register of Historic Places, (3) to determine what impact, if any, the project will have on the identified resources which appear to meet the criteria of eligibility for the National Register, and (4) to make recommendations for mitigation of adverse project related impacts on potentially eligible resources.

In addition to the research objectives related to cultural resource inventory and evaluation, the contractual scope of work also indicates that the component studies be performed in such a way as to obtain data which may be used to provide "model(s) to describe the probabilities for specific site type occurrence within the St. Francis Basin as a function of local physiographic features or other selected parameters" (Contract DACW66-78-C-0054:A-1). A research design for a predictive model of cultural resources within the St. Francis Basin has already been attempted for which the CIA studies field survey data will serve as input to help produce the probabilities for specific site type occurrence per areal unit of physiographic zone or unit of topographic feature (Iroquois Research Institute 1978a). There is a strong local interest in improving the drainage systems so that agricultural productivity may be increased; a predictive model for cultural resources in the St. Francis Basin would be a valuable planning tool for the region by providing project planners with information regarding the frequency and types of cultural resources that might be impacted by construction of a new ditch or by improvement of an existing one.

The input data necessary to power any predictive model is provided through the systematic and accurate recording of the physiographic and environmental characteristics of site locations. In addition, research related to definition of the local cultural chronology, site functions, settlement patterns, and regional relations is focused on through the investigation of all cultural resources in the component project areas.

Preliminary information on the technological, economic, and social characteristics of various prehistoric cultural periods is provided by the archaeological study of changing artifact styles, artifact assemblage characteristics, site sizes, and site locations. An analysis of site sizes and the range of artifact types present at various sites is expected to provide site function information and aid in the assessment of the behavior patterns of the prehistoric inhabitants of the Wappapello to Crowleys Ridge project area as well as to provide a basis for formulation of hypotheses regarding patterns of adaptation to the natural environment. Analysis of the spatial distribution of sites associated with various time periods is also expected to contribute to an understanding of changing patterns of human behavior within a segment of the St. Francis Lowlands.

The analysis of artifact styles and the identification of exotic raw materials is expected to show the participation of the prehistoric inhabitants of

the study area in regional cultural processes. Also, similarities in artifact styles is expected to indicate that other cultures in the central riverine region influenced the peoples of the project area or that the local peoples participated in regional cultural interactions.

The St. Francis River Basin has yet to undergo rigorous historical examination. Existing studies are based primarily on regional folklore and tradition or are simply genealogical, focusing on important individuals or families. Although systematic inventories of the historic archaeological resources have been compiled in connection with several recent cultural resource projects (Krakker 1977:149-155; Price, Price et. al. 1975:130-250), many basic questions regarding the nature and distribution of historic resources in the St. Francis Lowlands are yet unresolved.

Background research of local and regional history has outlined the broad patterns of economic, social, and political development and highlighted some of the most significant historical events which occurred in the area surrounding the Wappapello to Crowleys Ridge project. While the background research is expected to provide a necessary context for analysis of any historical resources encountered during the field survey, the field survey itself is expected to provide the opportunity to apply archaeological research techniques to the solution of historical research objectives. Definition of the historic cultural and demographic patterns is the primary historical research objective which will be addressed in light of the field survey data. That research objective is to be achieved by the use of such analytical tools as the study of habitation site locations, the geographic distribution of habitation sites, and the assessment of changes in these patterns of spatial distribution through time. Field inspection of the project right-of-way is expected to provide the basis for an outline of the economic character of the area through analysis of the present land use practices and identification of agricultural structures and industrial sites such as sawmills, grain mills, and cotton gins, should such sites be discovered.

Since comparatively few studies have dealt with architecture in the St. Francis Basin, the context necessary for the analysis and assessment of structures has not yet been fully developed. The most important research objective for the discipline of architectural history, then, is the identification of existing sites. The establishment of a workable sample which will reveal common dwelling types, materials, or placement is the primary research design goal.

Once the basic architectural character has been defined, the structures observed in the project area are expected to indicate the origins, geographical and ethnic, of the area's builders and inhabitants. Economic aspirations and capabilities are expected to be illustrated by such features as the choice of construction methods and materials, the relative complexity of floor plans, or the height and massing of structures. External influences, such as newspapers, agricultural journals, or the arrival of a new population via improved roads are also expected to be reflected by architectural forms and placement.

The study of the architecture in the area is expected to offer the opportunity to observe conventions in the process of alteration, modification, or total change: changing economic demands may inspire the adaptation of a dwelling for hay storage; modified aesthetics may require the addition of weatherboards to a log house. The presence of building forms foreign to the area such as a surburban ranch house is expected to indicate the degree to which the regional building culture has given way to the late 20th century quest for homogeneity.

SURVEY METHODOLOGY

Interviews with Local Informants

Interviews with local informants were conducted on a situational basis when they were encountered during the course of the fieldwork. Additionally, individuals known to have a special familiarity with the local cultural resources were actively sought out and interviewed.

A standard interview format was employed for the first type of interview. Certain questions or types of questions were always asked. After the introduction by an Iroquois field worker or interviewer, the potential informant was questioned concerning his or her familiarity with the study area; for example, "How long have you lived in this area?" or "How many years have you been farming this field?". The interviewee was further asked if he or she knew of any prehistoric or historic sites in the study area; for example, "Have you ever found or seen anyone else find Indian arrowheads or pottery in this area?". Finally, the interviewee was asked for permission to use his or her name in a final report. Interviews with those persons chosen for their specific knowledge of the study area were more flexible and depended largely upon the amount and kind of information the interviewee could provide. Similar questions were asked while obtaining the appropriate permission to perform an archaeological investigation on privately-owned lands. This permission was obtained in accordance with state guidelines.

Field Survey Methods and Data Recording

The field survey was conducted in two phases: (1) an initial on-the-ground survey of the project area and (2) a subsequent intensive examination of the sites discovered during the initial survey.

The on-the-ground survey of the project area was accomplished by one of two methods, the selection of which was determined by the local ground surface visibility. In areas where the ground surface was readily visible, a simple walkover examination of the project area was used as the survey method. Where vegetation obscured the ground surface, shovel tests were dug at regular inter-

vals in order to test for the presence of cultural materials. The shovel tests measure approximately 30 x 30 x 30 centimeters. The shovel tests were dug with pointed spades and the dirt from each test was troweled through and examined for the presence of artifacts.

Both survey methods were controlled by the use of transects which were aligned parallel to the channel or ditch centerline. Each traverse by an archaeologist was recorded as a single transect with the distance between transects varying according to the specific width of the project area or right-of-way in a particular segment of the project. The distance between transects was, however, never greater than 30 meters. Consequently, when a small crew size or an unusually wide right-of-way dictated, walk back transects were added to maintain an adequate level of survey coverage. When shovel testing was employed, the transects were spaced 30 meter intervals along each transect. A discussion of the reliability of transect survey and shovel test pit survey with those metric constraints is presented in a later section of this chapter.

In addition to recording the presence of cultural sites, the degree of surface visibility along the project area was assessed and recorded. Surface visibility observations were standardized to the extent that the field survey teams estimated the degree of ground surface visibility within a one meter wide transect area. Ground visibility was recorded as falling within one of four ranges: zero to 25%, 26 to 50%, 51 to 75%, and 76 to 100%. The actual ground surface visibility conditions recorded during this project are summarized in Table 14. A Visibility Index, designed to indicate the overall ground visibility of the entire project, is also presented in Table 14. The Visibility Index values may range from zero to 100, with the higher values indicating a greater degree of ground visibility, hence, more favorable survey conditions. The Visibility Index is computed as follows. Ordinal values are assigned to each range of surface visibility as follows:

Visibility Index Percent Visibility	Ordinal Value
0-25%	0
26-50%	1
51-75%	2
76-100%	3

The ordinal values are multiplied by the percentage of the project falling within each visibility range, and these products are summed. The sum of the products divided by three is the Visibility Index.

The criteria used for site definition in this project are consistent with standards which have been developed by practitioners of cultural resources management. For prehistoric sites, any locus manifesting evidence of human

activity, even a single artifact, was recorded as a site. This criterion is virtually identical with that employed in recent years by the Arkansas Archeological Survey (Dinwiddie 1978:44). In a recent cultural resource survey project performed in southeastern Missouri by the University of Missouri, site numbers were assigned to prehistoric resources only when three or more artifacts were found (Price, Price et. al. 1975:79). In the present study, historic resources were recorded as sites when an extant structure was present or when a concentration of artifacts was observed in the field. Roads, fences, and isolated artifacts were excluded from recordation as sites. No arbitrary date was employed to exclude historic resources from representation as sites.

The second phase of the field data gathering involved the intensive examination of sites which had been located during the initial on-the-ground walkover and included determining site sizes and boundaries, recording features of the local environment, sampling the artifact content of the sites, excavating test pits, and determining the relationship of the sites to the project.

Several techniques, used singly or in combination, were used to establish site sizes and boundaries. In situations where the ground surface visibility was poor, shovel test pits were dug at regular intervals along vectors from a common origin or along transects across the presumed site area, following a model presented by Chartkoff (1978). These shovel tests were identical in terms of size and technique to those dug along the survey transects. The experience of Iroquois Research Institute on other projects in the St. Francis River Basin has been that shovel testing is inferior for determining site sizes when compared to controlled surface collecting under favorable ground surface visibility conditions. Shovel testing is an effective technique for locating areas of high artifact concentration within sites, but not for delimiting site edges where artifact density is low.

The most frequently used technique for surface delineation involved the use of a regular grid system. The standard grid units employed were 10 x 10 meter squares, and the normal procedure was to collect all visible cultural material within the northeast 2 x 2 meter portion of each square and to selectively collect artifacts from the remainder of the grid unit on the basis of their diagnostic potential. The selectively sampled artifact collections were kept separate from the remainder of the artifact collections, so that data would be available for unbiased estimates of the population of certain artifact classes within the entire site. Small sites were covered almost entirely within such a grid system, while on larger sites, the grid units were placed at regular intervals across the site.

In some cases, controlled surface collections were made by partitioning the site into quadrants. In these cases, all visible artifacts on the surface were collected and provenience was recorded by the quadrant. In situations where extremely limited material was observed on the ground surface, all visible material was collected without intra-site provenience control.

Test excavations were conducted at selected sites in order to determine the depth of cultural deposits and the presence or absence of any undisturbed cultural strata as well as to gather data for interpretation of the depositional history of the sites. The standard procedure followed for test excavations was to remove the plow zone strata as a unit and to excavate in arbitrary 10 centimeter levels below the plow zone. Features were excavated separately and all artifacts within features were kept separate from those collected from the remainder of the excavation unit.

The relation of sites to particular design features of the project was carefully determined so that project related adverse impacts could be forecasted accurately. In most cases, this involved measurement of the lateral distance from the channel centerline or topbank to the site boundaries.

The archaeological assessment of historic sites included an inventory of the artifact content observed at the site. The presence or absence of general artifact classes and sub-classes was recorded, and only those artifacts with diagnostic potential were taken from the field. The historic artifact classification system outlined by Kenneth Lewis (1977) has been borrowed nearly intact for use in this project with some modifications and derivations incorporated from the system developed by Stanley South (1977). In the resulting system (Table 6), artifact assemblages are categorized into six general artifact classes which have been designed to define functional or activity related components on an empirical basis. The original artifact classification systems proposed by Lewis (1977) and South (1977) have been derived from pre-20th century site assemblages. Therefore, some new sub-classes may have to be added to handle the large quantity of 20th century archaeological resources which have been deposited in the St. Francis River Basin.

A specialized site form was developed to record data on standing structures. This standardized architectural description was designed to be completed in the field and includes the following elements: date of construction; function of the structure; type of structure; shape and orientation; number of stories; number of bays; types of construction; types of materials; type of foundation; material, number, and location of chimneys; material and shape of roof; number and construction of doors; number, type, and construction of windows; physical condition; associated buildings; and other specialized architectural features. In addition to the completion of this form, any architectural structure encountered during the survey was photographed.

All artifacts removed from the field were cleaned, identified, cataloged, and prepared for long term curation. Prehistoric artifacts were sorted according to the major formal categories listed in Table 7 and the raw material classes listed in Table 8. Historic materials were cataloged according to the subclasses listed in Table 6. A unique catalog number was assigned to each artifact or group of artifacts according to the artifact type raw material, and provenience unit. Following laboratory identification and analysis, the artifacts were placed in transparent plastic bags together with the pertinent identification and provenience data.

TABLE 6

ARTIFACT CLASSIFICATION FOR HISTORIC ASSEMBLAGES*

CLASS	CLASS DEFINITION	SUB-CLASSES
1	Artifacts related to collection, processing and storage of subsistence foods	1a. Collection of subsistence foods sub-class 1b. Processing of subsistence foods sub-class 1c. Storage of subsistence foods sub-class
2	Artifacts related to preparation and consumption of subsistence foods	2a. Tableware 2b. Kitchenware 2c. Ceramics 2d. Drinking containers 2e. Fireplace items 2f. Other
3	Faunal and floral remains of subsistence foods	3a. Animal bone 3b. Other
4	Tools and machinery used for solely technological activities	4a. Construction tools 4b. Miscellaneous hardware 4c. Other
5	Artifacts associated with the housing of persons and goods	5a. Architecture group 5b. Furniture group
6	Artifacts of a general nature associated with the presence of persons	6a. Clothing group 6b. Personal group 6c. Military objects 6d. Recreation group

*This classification has been adapted from Lewis (1977) and South (1977).

TABLE 7

ST. FRANCIS RIVER BASIN

ARTIFACT CODE SHEET

Bifaces

001 projectile point--complete
002 projectile point base
003 projectile point tip
004 projectile point mid-section
005 modified point--burinated
006 modified point--scraper
007 modified point--graver
008 modified point--perforator/drill
009 point preform (cache blade)
101 other preform
011 celt
012 axe
013 adze
014 hoe
015 hoe chip (polished)
016 end scraper
017 side scraper
018 scraper--both
019 burin
020 graver
021 perforator/drill
022 spokeshave
023 chopper
024 piece esquillee
025 cylindrical microlith
026 biface other--large more than 15 mm)
027 biface other--small (less than 15 mm)
028 biface fragment

Uniface--Flake

040 graver
041 burin
042 perforator/drill
043 spokeshave
044 notched flake
045 end scraper--hafted
046 end scraper--unhafted
047 side scraper--unhafted
048 side scraper--hafted
049 scraper--both
050 chopper
051 utilized flake
052 flake tool--indeterminate

Uniface--Blade

060 unmodified blade
061 utilized blade--endscraper
062 utilized blade--side scraper
063 utilized blade--graver
064 utilized blade--knife
065 utilized blade--other
066 microblade

Cores

070 polyhedral blade core
071 microblade core
072 pebble core
073 disc core
074 quarry waste
075 exhausted core
076 core fragment
077 other core

Debitage

080 primary decortication flake
081 secondary decortication flake
082 interior flake
083 retouch flake
084 shatter

TABLE 7 Continued

ST. FRANCIS RIVER BASIN

ARTIFACT CODE SHEET

085 core rejuvenation flake
086 other debitage

Ground Stone

090 gorget
091 bannerstone
092 boatstone
093 bead
094 figurine
095 pipe
096 discoidal
097 paint palette
098 spud
099 axe, full grooved
100 axe, 3/4 grooved
101 adze
102 celt
103 chisel
104 steatite bowl
105 abrader--notched
106 abrader--grooved
107 abrader--flat
108 indeterminate

Cobble Tools

120 edge ground cobble
121 hammerstone
122 chopper
123 anvil with U-shaped pits
124 anvil with V-shaped pits
125 mortar
126 pestle
127 pebble knife
128 other

Manuports

140 pigment
141 fossil
142 petrified wood
143 unmodified stone

Modeled Clay

150 rim sherd
151 body sherd
152 pottery disc
153 sherd abrader
154 daub
155 fired clay
156 pipe
157 bead
158 cone
159 plug
160 Poverty Point object
161 effigy
162 coil
163 squeeze
164 miscellaneous sherds

Worked Bone

170 awl
171 needle
172 fishhook

Shell

190 bead
191 bead manufacture debitage
192 gorget
193 hoe

Miscellaneous

200 fire-cracked rock

Composite Tools

299 composite tool

TABLE 8

ST. FRANCIS RIVER BASIN

RAW MATERIAL CODE SHEET FOR PREHISTORIC ARTIFACTS

ROCKS

Igneous

01 granite
02 rhyolite
03 basalt
04 gabbro
05 obsidian

Sedimentary

09 shale
10 mudstone-claystone
11 conglomerate
12 clay
13 sandstone--silica-cemented orthoquartzite
14 sandstone--clay-rich arenite
15 sandstone
16 oolitic limestone
17 limestone
18 ironstone
19 cannel coal

Metamorphic

25 schist
26 micaceous schist
27 quartzite
28 greenstone
29 steatite
30 granite gneiss
32 silica-cemented orthoquartzite
33 clay-rich quartz arenites

MINERALS

Silica Types

36 chalcedony
37 oolitic chalcedony
38 agate
39 jasper
40 Crowleys Ridge chert
41 Pitkin chert
42 Penters chert
43 chert breccia
44 quartz intra-clast chert
45 oolitic chert
46 Crescent Quarry chert
47 Arkansas novaculite
48 Dover chert
49 Burlington chert
50 Mill Creek chert
51 Dongola chert
52 Illinois novaculite
53 quartz crystal

TABLE 8 Continued

ST. FRANCIS RIVER BASIN

RAW MATERIAL CODE SHEET FOR PREHISTORIC ARTIFACTS

54 veined or milky quartz
55 quartz
56 chert--other

Non-Silica Types

59 hematite
60 kaolinite
61 calcite crystal
62 vein calcite
63 mica
64 catlinite
65 petrified wood
66 copper

POTTERY AND MODELED CLAY

71 shell tempered
72 sand tempered
73 grog tempered
74 untempered clay
75 undeterminate temper

ORGANIC MATERIAL

79 bone, ivory, tooth
80 wood
81 shell
82 textile
83 skin, hide
84 basketry
85 cordage

Survey Reliability

The Arkansas Archeological Survey has provided data for all sites in the Arkansas counties which are wholly or partially within the St. Francis River Basin. The site size data for some 1992 officially recorded prehistoric sites in Clay, Craighead, Crittenden, Cross, Greene, Lee, Mississippi, Phillips, Poinsett, and St. Francis Counties are presented in Table 9. Site size is reported as unknown for 330 sites or 16.6% of the total; for the remaining sites, size is reported by the Arkansas Archeological Survey as falling within one of six size intervals which are also indicated in Table 9. The use of this interval scale of measurement for site sizes obscures the precise size parameters of any one particular site's size, but the grouping of data permits a relatively simple calculation of the size parameters for the entire site population. The following paragraphs discuss the reliability of the field survey utilized in this study by reference to the site size parameters of the officially recorded site population in northeastern Arkansas. Although all officially recorded cultural resource data from the Missouri counties within the St. Francis River Basin have been incorporated into a research design for a predictive model for cultural resource locations (Iroquois Research Institute 1978a), the lack of site size data in the Archaeological Survey of Missouri data bank prohibits an analysis of the site size parameters for prehistoric sites in southeastern Missouri.

For the purpose of estimating the statistical reliability of the various field sampling strategies, each walkover transect is defined to be one (1.0) meter wide. This value is chosen because it closely approximates the minimum area that an archaeologist can survey while maintaining a constant bearing under diverse field conditions. The sampling fraction for spatial coverage is based on the width of the transects and on the intervals between transects. At 30 meter intervals, each transect therefore makes up 1/30 of the surface area which is equivalent to a sampling fraction of 3.33%. Under optimal field conditions an archaeologist can detect artifacts located up to several meters away; therefore, under these conditions the true sampling fraction exceeds 3.33%. Under less favorable field conditions where walkover transects are employed such as in a field of nearly mature soybeans, surface visibility is restricted to an area somewhat less than one meter in width. The probability that a site will be intersected during a walkover transect survey is a direct proportion of the site diameter to the interval between transects. In a situation where a field is surveyed by transects spaced at 30 meter intervals, the probability that sites of a given size will be intersected may be calulated as follows:

$$p = \frac{\text{diameter of site}}{29 \text{ m}}$$

A perfectly circular site shape is chosen since this meets the "worst case" criterion. Other site shapes have an increased probability of detection assuming random orientation. Discontinuities in a site's surface would also increase the probability of detection.

TABLE 9

FREQUENCY DISTRIBUTION OF PREHISTORIC SITE SIZES

IN ST. FRANCIS RIVER BASIN COUNTIES, ARKANSAS

COUNTY	SITE SIZE							TOTAL
	1-100 m^2	101-1,000 m^2	1,001-5,000 m^2	5,001-20,000 m^2	20,001-40,000 m^2	40,001 m^2 +	unknown	
Clay	2	18	34	22	10	17	22	125
Craighead	40	98	205	134	25	37	50	589
Crittenden	4	11	14	10	3	3	0	45
Cross	2	12	55	22	12	11	0	114
Greene	7	35	86	47	13	6	63	257
Lee	2	1	13	14	5	5	40	80
Mississippi	12	21	19	43	21	29	18	163
Phillips	2	20	24	31	8	7	0	92
Poinsett	12	92	98	39	15	2	113	371
St. Francis	12	22	34	43	8	13	24	156
TOTAL	95	330	582	405	120	130	330	1,992
Percent of Total Sites	4.8	16.6	29.2	20.3	6.0	6.5	16.6	100%
Percent of Total Sites with no Site Size	5.7	19.9	35.0	24.4	7.2	7.8	-----	100%

Source: Arkansas Archaeological Survey site files as of July 20, 1978.

For a shovel test pit (STP), the sampling fraction is the STP's surface area divided by the surface area in which it is centered. An STP is roughly circular and measures 30 centimeters in diameter; therefore, each STP represents a surface sample measuring 707 square centimeters. Centered on a surface area measuring 30 x 30 meters, and STP is equivalent to a sampling fraction of 0.0079% which may be considered a point sample. The probability that a site's surface will be intersected by STP's spaced at 30 meter intervals may be calculated as follows:

$$p = \frac{\text{area of site's surface}}{900\ m^2}$$

Irregularity of the site's shape or discontinuity of the site's surface does not affect this calculation. Extension of part of a site into zones defined by more than one STP does not affect the probability that it will be discovered.

Table 10 presents the size parameters associated with the site size categories used by the Arkansas Archeological Survey. Mean values for site size and diameter for each interval category have been calculated to allow mathematical analysis of the entire recorded site population. The mean values for site diameter and site size are, properly weighted, 90.7 meters and 6,458 square meters, respectively. The median values for these parameters are 71.1 meters and 3971 square meters. The mean values are greater than the median values signifying a positively skewed distribution for the recorded site sizes. More than half the sites have sizes which are below the mean size.

Using the Arkansas Archeological Survey site size data as an estimate of the size characteristics for the population of sites in the St. Francis River Basin, the reliability of various transect and shovel test survey intervals may be calculated, using the previous probability formulas. Table 11 presents a mathematical derivation of the reliability of a transect survey using 30 meter intervals. Using the mean diameter values calculated for each site size category, the probability (pd) that sites of that size will be discovered is calculated by the initial formula given above. This probability value is then multiplied by the frequency of sites recorded in that size category (f) to yield the number of sites that will be found. The number of sites that are expected (nd) are then summed. Virtually all sites in size categories 2, 3, 4, and 5 (larger than 57.8 meters in diameter) will be intersected during this type of survey. Approximately 28% of the smallest sites (size category 0) will also be found as well as approximately 91% of the sites with a diameter between 11.3 and 35.7 meters.

Finally, a summation of the number of sites expected to be intersected in each size category (1565) is divided by the total number of sites (1662) and converted to percentage notation. A total of 94% of the sites would be intersected utilizing transects spaced at 30 meter intervals.

TABLE 10

SITE SIZE CATEGORY PARAMETERS

FOR ST. FRANCIS RIVER BASIN COUNTIES, ARKANSAS

SIZE CATEGORY	SIZE RANGE	MEAN SIZE	DIAMETER RANGE	MEAN DIAMETER	NUMBER OF SITES
0	1-100 m^2	50.5 m^2	1-11.3 m	8.0 m	95
1	101-1,000 m^2	550.5 m^2	11.3-35.7 m	26.5 m	330
2	1,001-5,000 m^2	3,000.5 m^2	35.7-79.8 m	61.8 m	582
3	5,001-20,000 m^2	12,500 m^2	79.8-159.6 m	126.2 m	405
4	20,001-40,000 m^2	30,001 m^2	159.6-225.7 m	195.4 m	120
5	40,001 m^2 +	40,001 m^2 +	226 m +	226 m +	130

Mean site size = 6,458 m^2
Median site size = 3,971 m^2
Mean site diameter = 90.7 m
Median site diameter = 71.1 m

TABLE 11

RELIABILITY OF TRANSECT SURVEY AT 30 METER INTERVALS

FOR DISCOVERY OF SITES IN ST. FRANCIS RIVER BASIN, ARKANSAS

SIZE CATEGORY	NUMBER OF SITES (f)	MEAN DIAMETER	P_d	$n_d = P_d \times f$
0	95	8.0 m	0.28	27
1	330	26.5 m	0.91	301
2	582	61.8 m	1.00	582
3	405	126.2 m	1.00	405
4	120	195.4 m	1.00	120
5	130	226.0 m	1.00	130
TOTAL	1,662			1,565

The reliability of a shovel test pit survey utilizing a 30 meter interval is similarly outlined in Table 12. Using the mean site size values calculated for each size category, the probabilities that sites of that size will be intersected is calculated by the second formula. Approximately 86.8% of all sites should be intersected by an STP survey utilizing 30 meter intervals. Approximately six percent of the smallest sites (less than 100 square meters) will be sampled in this type of survey while approximately 61% of the sites with sizes ranging from 101 to 1,000 square meters will be sampled. All sites in size categories 2, 3, 4, and 5 (larger than 1,001 square meters) will be sampled.

The probability that sites in a particular survey area will be discovered is dependent on many factors besides the metric intervals between walkover transects or shovel tests. Field conditions such as vegetative cover, ground surface erosion, soil moisture, and soil color may significantly affect the visibility of surficial artifacts; the experience, eyesight, alertness, and fatigue of the observers also affect the results of an inventory survey. Finally, complete burial of a site ensures that it will not be discovered during a surface walkover survey.

The reliability of various survey techniques may be mathematically approximated for a particular study area, given: (1) a reliable estimate of the site size distribution for the population, (2) a willingness to entertain an assumption of uniform field conditions, and (3) information regarding the potential for discovery of deeply buried sites.

In the preceding discussion, the complete site inventories for Arkansas counties in the St. Francis River Basin were chosen as an estimate of the site size parameters for the regional site population. While these records represent the largest available data base, the scientific reliability of the AAS data is extremely variable. The AAS files have been strengthened in recent years by the results of several systematic surveys; however, a large percentage of the sites recorded by the AAS have been reported as a result of unsystematic survey activity. Regarding the effects of variable field conditions, there is no published discussion of the effects of various field conditions on the rate of site discovery. Also, there has been no systematic project directed toward ascertaining the extent of deeply buried cultural sites in the St. Francis River Basin although a proposed research program for locating deeply buried Paleo-Indian sites in the Cache River Basin has been published (R. Taylor 1975).

Although it may be desirable to establish some criterion of adequacy for cultural resource inventory surveys, such as 90 or 95% reliability, there is a more immediate need to obtain reliable estimates of the site size distribution in a given area. The data available from the Arkansas Archeological Survey does indicate that the site sizes in the St. Francis River Basin are positively skewed; that is, there are many more small sites than large sites. The labor cost for a transect survey with 95% reliability is 31% higher than that required for a 90% level of reliability, and the cost differential between 90% and 95% reliability in an STP survey is approximately 40%. The practical limitations of available funds under which all CRM projects operate must be balanced against the desirability of locating high percentages of small sites.

TABLE 12

RELIABILITY OF SHOVEL TEST PIT SURVEY AT 30 METER INTERVALS FOR DISCOVERY OF SITES IN ST. FRANCIS RIVER BASIN, ARKANSAS

SIZE CATEGORY	NUMBER OF SITES (f)	MEAN SIZE	P_d	$n_d = P_d \times f$
0	95	50.5 m^2	0.06	6
1	330	550.5 m^2	0.61	201
2	582	3,000.5 m^2	1.00	582
3	405	12,500 m^2	1.00	405
4	120	30,000 m^2	1.00	120
5	130	40,001 m^2 +	1.00	130
TOTAL	1,662			1,444

Locational Control

Locational control of archaeological data is essential in order to insure the best possible management of identified cultural resources. Specific project impacts can be accurately determined only when the relation of a project and its features to the cultural resources is strictly defined. These quantifications and subsequent determinations are necessary so that the best overall compromises between the design of a project and the preservation or mitigation of the resources can be developed.

From the outset, the effort to obtain accurate locational control for the Component Investigation Area studies encountered several limitations. Horizontal control in the St. Francis project area is sparse. Although the U.S. Army Corps of Engineers topographic quadrangle maps show benchmarks and control points every few miles, these are usually found on the major roads and railroads. Their proximity to the areas encompassed by the component investigations is often measured in miles. In addition, tree lines and woods limit the useful range of triangulating with a theodolite. Thus, relating the locations of the identified cultural resources to the existing benchmarks and control points necessitates a very slow and expensive process.

A more serious limitation is the actual status of the control monuments. The majority of these have been destroyed, overgrown, or otherwise obscured. A large time investment is required simply to locate many of them even after the background data describing their locations have been obtained from the appropriate sources. The investment of time and manpower needed to obtain horizontal control for the Component Investigation Area studies by traditional methods is seldom economically justifiable.

With long range triangulation and distance measuring techniques effectively removed as viable approaches to insuring locational control, other methods had to be developed for the specific archaeological surveys. To this end, the Corps of Engineers provided project design maps of the component areas that had been produced from aerial photographs. These construction drawings were used by the Iroquois field crews to identify short range landmarks such as houses, tree lines, and roads. Since geodetic coordinate grids were also put on these project maps, specific points could be transferred to the topographic quadrangle maps and thereby be related to their UTM coordinates. By using these maps, then, locational control became a matter of orienting site datums to the landmarks that were visible and locatable on the project design maps.

The principle for using angles to determine a location is simple. The angles measured between three landmarks (points) from a common point will define that point uniquely. If a compass is used, two landmarks are sufficient since the compass bearing essentially replaces the third point. However, using three points is preferred since any offset declination error and most other 'distor-

tions' - for example, the magnetic effects of belt buckles and watches - can be eliminated. A Brunton compass set on a tripod has sufficient accuracy when nearby landmarks are used. The surveyor's field task is greatly simplified since he has only to find a site datum, set the compass and tripod over it, measure the bearings to the three nearby landmarks, and record the data. A survey crew is not needed although an aide may be used on occasion to mark a road intersection or similar feature.

Once the data have been obtained in the field, they can be processed in the field office within a day. The bearings to the landmarks are drawn onto graph paper as geometric rays. The graphical axes are used as the compass directions so the graphical solution can be oriented to the project design map's geodetic grid. The graphical solution is then laid over the map. When the rays have been lined up over the landmarks and checked with parallel grids, the location of the point has been found and can be accurately plotted.

When dealing with angles for locational control, the uncertainty or range of error is a function of the accuracy of the angle measurements coupled with the distance to the landmarks. The Brunton compass used by Iroquois can be read accurately to the nearest degree. This gives an uncertainty of ± 0.873 meters per 100 meters of distance from the datum. If the uncertainty of each measurement is assumed to be a 'corridor', the total locational uncertainty can be graphically represented by the intersection of the three individual uncertainties (Figure 3).

There are also uncertainties in the landmark images on the project design maps that need to be taken into account. With an engineer's rule that has 1/50 of an inch resolution, there is a graphical uncertainty of ± 1.27 meters at the 1:5000 scale. However, a landmark's image must be very sharp for this accuracy. Therefore, when tree lines or woods have to be used, larger errors are to be expected. The project maps may also have some unquantified distortion resulting from the production and reproduction processes.

The project design maps contain only geodetic coordinate grids on them. Consequently, the most accurate coordinates obtainable are geodetic. In order to calculate UTM coordinates, the quadrangle maps must be utilized. To do this, datum points are plotted on the quadrangle maps by their geodetic coordinates. These coordinates are then read off in the UTM system. This system is, however, filled with uncertainty. When 15 minute quadrangle maps are used, the final UTM result could have an uncertainty of up to 50 meters. The 7.5 minute quadrangle maps are more accurate with an uncertainty of approximately 20 meters. The vast majority of topographic quadrangle maps available for the St. Francis Basin are, however, of the 15 minutes series.

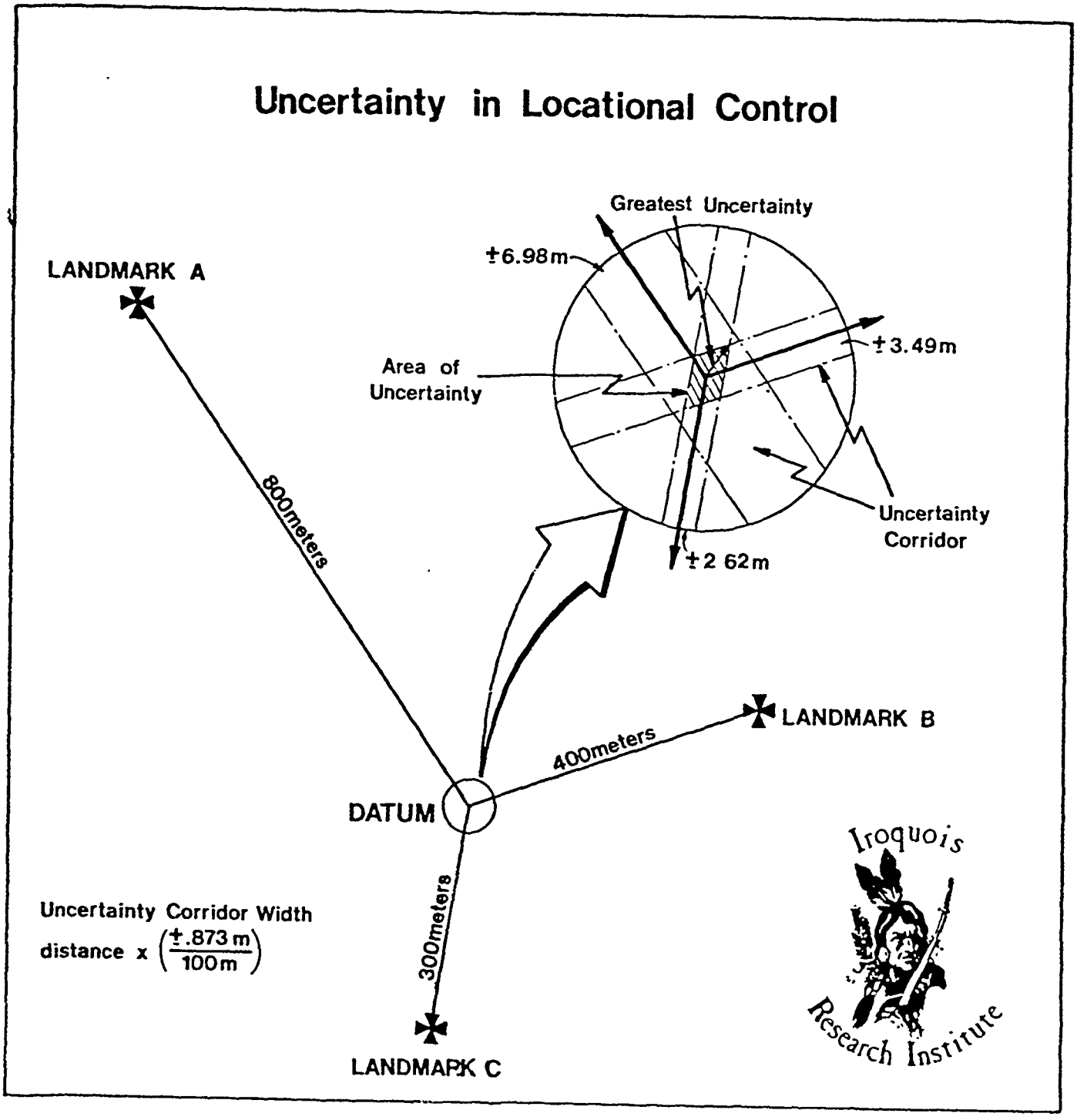


Figure 3. This figure shows how the uncertainty can be quantified. 'Uncertainty corridors' have been drawn in the inset. The shaded area, the intersection of all these corridors, is the area of uncertainty. The greatest uncertainty in this example would be about 5 meters. All of these calculations assumed use of a brunton compass with ± .5 degree accuracy. Knowing the uncertainty of the coordinate locations facilitates locating the site in the future.

RESULTS

Overview

Initially, a total of 54 cultural resource sites were recorded during Iroquois Research Institute's field investigation of the Wappapello to Crowleys Ridge Channel Improvement and Scour Repair project area. However, after a careful assessment of the exact site locations, three of these sites (23SO402, 23SO403, and 23SO407) were determined to be outside of the right-of-way boundaries. Therefore, the current inventory of sites within the project area numbers 51.

Table 13 lists the 54 sites recorded, indicating for each whether a prehistoric, historic, or architectural component is present. The majority of the sites reflect activity during the historic period while only 14 sites contain evidence of prehistoric cultures. The distinction between historic and architectural components is based on the presence or absence of standing structures. If a site had a standing structure at the time of the field investigation, it was considered an architectural site; a site that contained material of Euro-American origin in archaeological context only was considered historic. Thus, the term "historic" does not necessarily imply a great age.

The field work in the project area was carried out between May 5th and June 2nd, 1978. Weather conditions were relatively good with daytime temperatures ranging from cool to hot as the field season progressed. Afternoon thunderstorms washed plowed fields and increased visibility in agricultural areas. However, much (41%) of the project area was located in woods with a heavy ground cover which decreased surface visibility. A summary of the surface visibility conditions observed during the survey of the project area is presented in Table 14. As shown in this table, the surface visibilities were usually either very good, with 76%-100% of the ground visible (49.6% of the project area), or very poor, with 0%-25% visibility (41.0% of the project area). Surface visibility was estimated by reference to a hypothetical one meter wide transect centered about each crew member who judged the percentage of ground visible within the transect.

The site occurrence rates according to physiographic zones are summarized in Table 15. A total of 941 acres were surveyed in this project. Ninety percent of the area surveyed is classified as meander belt and the remainder is classified as apron deposit (Iroquois Research Institute 1978a:283-300). Within the Meander Belt Physiographic Zone, occurrence rates of 6.8 prehistoric sites per square mile, 15.1 historic archaeological sites per square mile, and 15.1 architectural sites per square mile were calculated. Within the Apron Deposit Physiographic Zone, occurrence rates of 13.9 prehistoric sites per square mile, 13.9 historic archaeological sites per square mile, and 27.8 architectural sites per square mile were calculated. However, these latter occurrence rates should be interpreted cautiously since only 92 acres of the surveyed area are within the Apron Deposit Physiographic Zone. Three prehistoric components and one historic

TABLE 13

SUMMARY OF CULTURAL RESOURCE SITES

STATE NUMBER	FIELD NUMBER	COMPONENTS	STATE NUMBER	FIELD NUMBER	COMPONENTS
23BU205	WC #45	H	23SO402*	WC #26	P
23BU206	WC #3	H	23SO403*	WC #27	P,H
23BU207	WC #4	H	23SO404	WC #29	H
23BU208	WC #5	P	23SO405	WC #30	H
23BU209	WC #6	P	23SO406	WC #31	H
23BU210	WC #10	P,H	23SO407*	WC #33	P
23BU211	WC #15	H	23SO408	WC #35	H
23BU212	WC #44	P	23SO409	WC #37	H
23BU213	WC #46	H	23SO410	WC #38	H
23BU214	WC #48	P	23SO411	WC #39	H
23BU215	WC #49	P,H	23SO412	WC #42	P,H
23BU216	WC #50	H	23SO413	WC #56	P
23BU217	WC #51	P,H	23SO414	WC #57	H
23BU218	WC #7	A	23SO443	WC #1	A
23BU219	WC #8	A	23SO444	WC #2	A
23BU220	WC #9	A	23SO445	WC #12	A
23BU221	WC #11	A	23SO446	WC #20	A
23BU222	WC #14	A	23SO447	WC #21	A
23BU223	WC #17	A	23SO448	WC #22	A
23BU224	WC #43	A	23SO449	WC #23	A
23BU225	WC #47	A	23SO450	WC #24	A
23BU226	WC #52	A	23SO451	WC #25	A
23BU227	WC #53	A	23SO452	WC #28	A
23BU228	WC #16	H	23SO453	WC #34	A
23SO398	WC #13	H	23SO454	WC #36	A
23SO400	WC #18	P,H	23SO455	WC #40	A
23SO401	WC #19	P,H	23SO456	WC #41	A

P = Prehistoric H = Historic A = Architectural

Total prehistoric components: 14
Total historic components: 23
Total architectural components: 24
Total number of sites: 54

*Site located outside of project right-of-way.

TABLE 14

SURFACE VISIBILITY CONDITIONS RECORDED AT THE

WAPPAPELLO TO CROWLEYS RIDGE CHANNEL IMPROVEMENT

AND SCOUR REPAIR PROJECT

PERCENT VISIBILITY	LINEAR DISTANCE (in km)	LINEAR DISTANCE (in mi)	PERCENT OF AREA EXAMINED
0-25	27.4	17.00	41.0
26-50	6.0	3.75	9.0
51-75	0.2	0.15	0.4
76-100	33.2	20.60	49.6
TOTAL	66.8 km	41.5 mi	100%
Visibility Index: 52.9			

TABLE 15

CULTURAL RESOURCE SITE OCCURRENCE RATES

ACCORDING TO PHYSIOGRAPHIC CATEGORIES,

WAPPAPELLO TO CROWLEYS RIDGE PROJECT AREA

PHYSIOGRAPHIC CATEGORY	ACREAGE	SITES PER SQUARE MILE		
		PREHISTORIC (n=11)	HISTORIC ARCHAEOLOGICAL (n=22)	ARCHITECTURAL (n=24)
Meander Belt-Point Bars	849	6.8	15.1	15.1
Apron Deposit	92	13.9	13.9	27.8

archaeological component have been excluded from the calculation of site occurrence rates since those sites were determined to be outside the actual project right-of-way.

The survey results summarized in Table 15 may be analyzed together with the results of other Component Studies completed under this contract in order to attempt a predictive model for cultural resource site locations within the entire St. Francis Basin (Ibid.:231-250).

The sites inventoried during the field survey are described in the following pages. Specific details of individual site locations are not included in these descriptions in order to protect the resources from vandalism, looting, and pothunting. The site designations used throughout the text are official trinomials assigned by the Archaeological Survey of Missouri. Each number consists of three parts: a prefix "23" which indicates the site is in Missouri, a two letter abbreviation for the county ("BU" for Butler County and "SO" for Stoddard County), and a series of numerals which is unique to the site.

During the course of the field survey, a temporary identification number was assigned to each site, and Table 13 indicates this number as well as the official trinomial for each site. Each field number consists of the prefix "WC" which designates the Wappapello to Crowleys Ridge project plus a unique numeric suffix. Gaps in the numerical sequence of field numbers may result from assigning blocks of numbers to different crew chiefs or from merging two cultural loci into a single site.

The following site descriptions are arranged in alphanumeric order of the official trinomials.

Site Descriptions

23BU205

This historic site is located in a field at the edge of a wooded area. The site consists of a surface concentration of artifacts and materials that includes: garden implements; a variety of household items, appliances, and furniture; architectural debris; and miscellaneous hardware and machinery. No foundations were observed in the vicinity, and there is no evidence of a structure at this location on maps dating from 1848, 1932, 1954, or 1965. The site appears to be a refuse area or dump not in association with a habitation site.

23BU206

This historic site located in a wooded area about 10 meters from the St. Francis River on its right descending bank contains the remains of a cubical, steel-reinforced concrete structure. No artifacts were found in association with

the structural debris. A local resident identified it as the remains of a pumping station built shortly before 1920 at the same time the levee was built.

23BU207

This historic site located on the right descending bank of the St. Francis River approximately 80 meters south of Highway 60 consists of a pile of steel-reinforced concrete fragments with broken glass, ceramics, and brick. There is no cartographic evidence of a former structure at this location, and a local resident confirmed that the material had been dumped at the site.

23BU208

This prehistoric site is located in a plowed field approximately six meters from the topbank of the St. Francis River. During the initial walkover, a light scatter of lithic materials was observed over an area estimated to be approximately 100 square meters. A few flakes and a non-diagnostic biface were observed. The landowner seeded the field shortly after the initial walkover of the site and would not allow additional archaeological examination of the area. The available data is inadequate to ascertain the chronological position and functional character of the site.

23BU209

This prehistoric site is located in a plowed field approximately 35 meters from the St. Francis River. The site area which is about 25 square meters in size was intensively searched, but despite good ground visibility only two artifacts were observed. Because of the limited amount of material at the site, after these artifacts were collected there was no further examination of the site. A non-diagnostic biface made of Burlington chert and a piece of debitage made of an unidentified chert are the artifacts collected. The site's chronological position cannot be determined from the available data. The small size of the site and the small amount of artifactual material suggest only a brief period of utilization.

23BU210

This site was located during a walkover survey approximately 80 meters from the St. Francis River. It occupies a small rise in a cultivated field on the right descending bank of the river and contains evidence of both prehistoric and historic activity. The rise reaches a height of approximately 60 to 90 centimeters above the surrounding floodplain, and its soil is noticeably darker than the surrounding soil, suggesting that the rise is a prehistoric midden deposit. After a preliminary examination of the area, its location was recorded and plans were made for intensive archaeological examination at a later date.

When the crew returned to the site, a grid origin was established in the approximate center of the site and shovel tests were dug at five meter intervals along the cardinal axes to define the area of artifact concentration. Fifteen of

the 25 shovel tests yielded cultural material. All visible prehistoric artifacts were collected from the site surface and their provenience was recorded by quadrants. Based on the results of the shovel tests and the surface collection, the site area is estimated to be approximately 30 x 50 meters.

A 1 x 2 meter test pit was opened adjacent to the shovel test which yielded the highest number of artifacts. This excavation was terminated prematurely, however, since the landowner began seeding the field and would not allow digging to continue. The excavation was completed to a depth of only five centimeters, but a fairly dense concentration of materials was recovered, including ceramics, lumps of fired clay, fire cracked rock, flake tools, a core, two projectile points, bone, and shell.

The 245 prehistoric artifacts recovered from the site include bifaces, flake tools, ceramics and baked clay objects, debitage, cores, fire cracked rock, and a composite tool. Diagnostic artifacts in the collection include two Scallorn points (Plate 8:A, C), one untyped side notched point (Plate 8:D), one Poverty Point object ("pillow" type) (Plate 9:E), 29 Barnes Cord Marked sherds (Plate 9:B), one Barnes Plain sherd, four Neeleys Ferry Plain sherds, and six sherds (Plate 9:F, H) that are similar to the Buckskull ceramic type defined by Price, Price and Harris (1976:42). The Poverty Point object indicates occupation of the site during the Late Archaic Period (Webb 1977). The Barnes Plain and Barnes Cord Marked sherds are Woodland period indicators, and the Neeleys Ferry Plain sherds are Mississippian Period diagnostics. Scallorn points are considered diagnostics of the Mississippian Period, although they may occur in Late Woodland assemblages (Bell 1960:84-85). The combination of sand, shell, and grog tempering in the Buckskull-like sherds suggests that their temporal position would be during the Woodland to Mississippian transitional period.

Historic materials observed at the site include bottle glass, nails, and miscellaneous metal fragments. The glass is clear and appears to be modern. The nails are very deteriorated but appear to be machine cut, a technique dating from the 1830's to the present (Nelson 1968). Since there is no cartographic evidence of a structure at this location, a definitive assessment of this historic component is not possible based on the limited material found.

23BU211

This historic site is located in a wooded area approximately 35 meters from the St. Francis River. Materials observed at the site include four wooden crates, a fishing gig, a fireplace grate, and a few planks nailed to a tree. The site is probably the remains of a modern fishing camp.

23BU212

This prehistoric site is located in a plowed field approximately 80 meters from the St. Francis River. The site area was intensively examined, but despite good ground visibility only two artifacts were observed over an area measuring

approximately 10 square meters. Because of the limited amount of cultural material at the site, no additional examination of the site was scheduled. The artifacts collected are a non-diagnostic biface made of Crowleys Ridge chert and a quartzite flake. The site's chronological position cannot be determined from the available data. The small site size and the limited amount of artifactual material suggest only a brief period of occupation.

23BU213

This historic site is located on the border of a plowed field and a wooded area. The site consists of several piles of sawdust, lumber, and split logs. No *in situ* structural features were observed at the site and there is no cartographic evidence of a structure having existed at this location. The material is probably the remains of a recent lumber extraction industry of short duration.

23BU214

This prehistoric site is located on a slight rise in a cultivated field approximately 40 meters from the St. Francis River. During the initial walkover, a scatter of lithic and ceramic materials was observed over a small area After preliminary examination of the site, its location was noted for intensive archaeological examination at a later date.

On return to the site, a grid of 10 x 10 meter squares was laid out over the site. All artifacts in the northeast 2 x 2 meter portion of each grid unit were collected and artifacts were collected on a selective basis from the remainder of the area. The gridded area covered a total of 3,600 square meters, and the mean surficial artifact density was calculated at 0.1 artifacts per square meter, based on the density in the 2 x 2 meter collection units. The surface distribution of artifacts indicates a site size of approximately 3,600 square meters. The 17 shovel tests which were placed at five meter intervals along the axes of the grid recovered no artifacts. Because no material was recovered from the shovel tests and the surficial material was so scant, site examination procedures were terminated.

The artifact assemblage from this site includes bifaces, flake tools, a blade tool, cores, debitage, fire cracked rock, a manuport, a composite tool, and ceramics. One biface (Plate 8:G) is a point similar to the Big Creek point type (Morse 1970) which suggests a Late Archaic occupation at the site. The entire ceramic collection from the site is comprised of Neeleys Ferry Plain sherds which indicates the presence of a Mississippian Period component.

23BU215

This site is located in a cultivated field adjacent to the St. Francis River and contains evidence of both prehistoric and historic activity. During the initial walkover, a scatter of prehistoric lithics was observed over an area estimated to measure 40 x 40 meters. After a preliminary examination of the

site, its location was recorded so that an archaeological crew could return for intensive site examination procedures. Shortly after discovery of the site, the field was plowed and seeded. The crew walked the area but was unable to relocate any prehistoric cultural material. The landowner was unwilling to allow subsurface investigations, so no further work was done at the site. The presently available data is insufficient to assess the chronological position or functional character of the prehistoric component.

The historic assemblage is limited to a few ceramic fragments and an unidentified rusted metal object. There is neither cartographic evidence nor field evidence of a structure having occupied this location. The historic component is probably related to the discard of refuse.

23BU216

This historic site is located in a tree line adjacent to a cultivated field approximately 16 meters from the St. Francis River. The materials present at the site include a roll of rusted fencing wire, metal pipe, and a tiller. There is no cartographic or field evidence of a former structure at this location. The materials were probably discarded at the site.

23BU217

This site is located in a slightly depressed area created by bulldozing within a cultivated field on the right descending bank of the St. Francis River and contains evidence of both prehistoric and historic utilization. During the initial walkover, a scatter of prehistoric lithic and ceramic artifacts was observed over an area estimated to measure 30 x 40 meters. After a brief examination of the site area the site location was recorded so that a crew could return for intensive site examination procedures.

Upon return, the site area was carefully searched but only a single piece of debitage was found. Because of the limited amount of material at the site, subsurface testing was not warranted. Based on the observation of grit or sand tempered ceramics at the site during the initial walkover, a Woodland occupation is tentatively suggested for the site. The small size and the limited amount of artifactual material at the site suggest only a brief period of occupation.

The historic materials observed at the site include bottle glass fragments, ceramics, small unidentifiable metal fragments, and a fishing bobber. The base of a white earthenware jar or bottle which was collected exhibits an ink stamped circle and the letters "CO". It probably dates to the late 19th or early 20th century. There is no cartographic or field evidence of a structure having occupied this location, and the historic materials were probably discarded at this site.

23BU218

This architectural site is located 12 meters west of the St. Francis River bank in a cleared area just south of a plowed field. It includes a rectangular

shed, the central building of a small fishing camp. The one story frame structure is in good condition. It rests on an open concrete block foundation and is finished with vertical wooden planks. The basically flat roof and the exterior walls are covered with tar paper. In addition, battens have been nailed vertically to the exterior walls at irregular intervals. The rafters of the roof are visible on all sides of the structure. The entrance and the one large, single pane window appear on the long side which faces and parallels the river.

Associated with the fishing shed are a pump, privy, and storage shed, the latter in a state of deterioration. The shed and privy are located to the south and north of the main structure respectively, the three buildings forming a row parallel to the river. Glass fragments and a hoe were observed at the site. Its date of construction has been estimated as post World War II.

23BU219

This architectural site is located approximately eight meters west of the St. Francis River. The site consists of a rectangular, one story frame structure resting on an open concrete block foundation. The ridge of the corrugated metal gable roof parallels the long entrance side. Roof rafters are visible on the top long sides. Vertical wooden planks form the exterior walls and are covered with hexagonally patterned composition siding. A double hung sash window, with one over one lights, appears on each side of the building. The entrance is located on one long side. The building is decorated with highway signs nailed to the exterior walls. Glass, beer cans, ceramics, farm machinery, and abandoned cars were observed at the site. A privy associated with the building is 36 meters to the south. The structure, still in use and in good condition, is estimated to have been built in the 1930's.

23BU220

This architectural site is located 15 meters west of the St. Francis River. At this site stands a one story, rectangular, double pen frame dwelling and a fenced area. Resting on an open concrete block foundation, the structure has tar papered wooden walls and a corrugated metal gable roof. The ridge of the roof parallels the entrance side and a stove pipe appears off center. A hollow core door and double hung sash windows are present. The dwelling serves as temporary quarters while a permanent house is being built. It is in good condition and of very recent construction.

23BU221

This architectural site is located along a farm path running north-south 20 meters west of the St. Francis River. Along the sides of the path are located two frame animal pens and an abandoned rusted tractor. The pens, one for swine and one for fowl, are composed of split logs covered with vertical wooden boards, and both are partially collapsed. Both structures are of the shed form with corrugated metal single slope roofs. Their date of construction is estimated to be post World War II.

23BU222

This architectural site is located 16 meters west of and parallel to the St. Francis River. At the site a mobile home of metal construction rests on concrete blocks. The major features of this structure are a shallow gable roof which appears flat, single pane windows, and two metal doors, one on each long side. A double hung sash window flanks one of the entranceways. A floating dock on the river is reached by a set of wooden stairs. A refuse dump, gas tank, and light pole were also observed at the site. The trailer is used by fishermen and is in good condition. It was most likely constructed and located after World War II.

23BU223

This architectural site is located nine meters west of the St. Francis River. The two dilapidated house trailers standing on concrete blocks are still in use as a fishing camp. Stationary sash and horizontal sliding windows appear on both structures. One trailer has a barrel roof, paralleling its long sides. The roof of the second trailer arches from short side to short side or front to rear. The long dimensions of the trailers parallel the river. Deteriorated picnic tables and electric poles were observed at the site. The trailers probably date to the 1950's.

23BU224

This architectural site is located 80 meters west of the St. Francis River at the western edge of a wooded area. The site consists of a pig pen and shed which are estimated to have been built in the 1950's. The one story, one bay shed is of pole frame construction and is covered with a gable roof of corrugated sheet metal. It is approximately 10 meters long and six meters high. Board and batten siding and sheet metal protect the exterior walls. The entire eastern side of the shed is open and a corn crib is located within. To the west of the shed is an occupied pig pen. Wire fencing attached to wooden poles defines the area. The site is in good condition.

23BU225

This architectural site is located 60 meters west of the St. Francis River, directly north of a plowed field and consists of a one room deep, rectangular, balloon frame dwelling. Resting on a high, open concrete block foundation, the one story structure is covered with both vertical and horizontal weatherboarding. A shed roof of corrugated sheet metal protects the structure, and a hollow core door serves as the entrance at one short end. The structure most closely resembles an elongated agricultural shed. It may have been associated with a nearby sawmill site (23BU213). In fair condition, the building's estimated date of construction falls within the 1930's.

23BU226

This architectural site is located on the west bank of the St. Francis River and consists of a dwelling, a privy, four storage sheds, and a small guest house.

The outbuildings are in fair condition, but the house is currently being remodelled. The one story, balloon frame dwelling is covered with weatherboarding and is L-shaped. A three bay porch appears at the interior angle of the L. A projecting bay of three sides occurs on one long side. The low pitched gable roof is covered with composition shingles. Two hollow core doors, four six over six lights double hung, and 12 horizontal sliding windows are part of the structure. The dwelling is in good condition and is estimated to have been built during the 1960's.

23BU227

This architectural site is located on the west bank of the St. Francis River and contains a dwelling used by fishermen and a storage shed. The rectangular, balloon frame main structure rests on pilings and is one story in height. Thin plywood sheets cover the exterior walls. The gable roof is provided with tar paper. A stovepipe is in evidence as are five horizontally sliding windows. A doorway occurs at each of the short ends, one of which faces the river. The associated shed is of metal construction. A garden plot and various domestic artifacts were also observed. Estimated to have been built around 1950, the structures are in good condition.

23BU228

This historic site is located in a wooded area on the right descending bank of the St. Francis River approximately 15 meters from the topbank. The site consists of a simple animal pen constructed of barbed wire strung between trees. It is approximately 15 meters in diameter and appears to have fallen into disuse. A pull tab from a soft drink or beer can indicates that the site was visited sometime since the mid-1960's.

23SO398

This historic site is located in a cultivated field adjacent to the St. Francis River and a dirt road. A scatter of brick was observed over an area measuring approximately 10 x 30 meters, but no other materials were present. There is no cartographic evidence of a structure at this location, nor does the assemblage suggest that there was a building at this site. The material was probably discarded at the site.

23SO400

This site is located near the margin of a wooded area and a cultivated field on the left descending bank of the St. Francis River approximately 70 meters from the topbank and contains evidence of both prehistoric and historic activity. During the initial walkover survey, a light scatter of prehistoric lithic material was observed in a shallow erosional gully at the edge of a dirt road. After a brief examination of the area, the site location was noted and a datum stake was left so that a crew could return for intensive examination procedures.

On return to the site, a grid of 10 x 10 meter squares was laid out over the site and all visible artifacts were collected. The grid encompassed an area of only 400 square meters since the site is very small. Seventeen shovel tests were placed at five meter intervals along the grid axes. Two of these tests yielded one artifact each. Based on the distribution of surface materials and the results of the shovel tests, the site is estimated to cover an area measuring roughly 10 x 20 meters. Because so few artifacts were recovered from the surface and shovel tests, further work at the site was not undertaken. The entire prehistoric artifact collection from this site consists of two flake tools and 10 pieces of debitage. There is insufficient data to determine the chronological position of the site.

The historic component at the site includes a sawdust pile, a few pieces of plank, window glass, modern bottle glass, stoneware, and earthenware ceramics. There is no cartographic evidence of a structure at this location. The materials are probably the remains of a recent lumber industry of short duration.

23SO401

This site occupies a low rise about one meter above the surrounding floodplain of the St. Francis River approximately 10 to 15 meters from the topbank and contains evidence of both prehistoric and historic occupations. Under a dense cover of grasses, the site was initially discovered by means of shovel tests along transects parallel to the river.

Because of the heavy ground cover over the site, surface collection was not attempted. A point on the southern slope of the rise was selected as the grid origin, and shovel tests were placed at five meter intervals along the cardinal axes from this point. Thirty-two of the 41 shovel tests yielded artifacts, and many of the tests contained 10 or more artifacts. On the basis of the shovel testing, the dimensions of the site are estimated to be 50 x 130 meters with the long dimension of the site parallel to the course of the river.

A 1 x 2 meter test pit was placed near the crest of the rise in order to ascertain the subsurface extent of the site. Excavation was continued to a depth of 60 centimeters below the surface and then discontinued because the artifact yield had diminished significantly. The soils throughout the excavation were silty clays. The plowzone extended to a depth of approximately 30 centimeters below the ground surface and was a dark brown color. Sub-plowzone soils ranged from medium dark brown at the interface with the plowzone to light brown at the base of the excavation unit. At the bottom of level 3 (50 centimeters below the surface), a dark, circular stain measuring approximately 13 centimeters in diameter was observed. It resembled a post mold and was therefore excavated in profile. The stain tapered gradually to a point some 50 centimeters below where it was first observed, however, and is more likely a decayed root than a post mold.

The artifacts recovered from the test pit are summarized in Table 16. Historic and prehistoric materials are mixed in the upper levels, but no historic

TABLE 16

STRATIGRAPHIC SUMMARY OF TEST PIT 16N,2E

SITE 23SC401

LEVEL	DEPTH BELOW SURFACE	EXCAVATION DIMENSIONS	MATERIALS RECOVERED
1	0-30 cm	1 x 2 m	51 Neeleys Ferry Plain sherds 28 Barnes Cord Marked sherds 4 Buckskull-like sherds 3 fired clay 10 bifaces 22 flake tools 2 ground stone tools 2 composite tools 3 cores 221 debitage 41 fire cracked rock 1,434 historic artifacts (brick, nails, glass, ceramics, hardware, button)
2	30-40 cm	1 x 2 m	19 Neeleys Ferry Plain sherds 8 Barnes Plain sherds 4 Barnes Cord Marked sherds 8 Buckskull-like sherds 6 indeterminate sherds 2 fired clay 7 bifaces 1 blade tool 1 flake tool 2 ground stone tools 3 manuports 7 cores 193 debitage 25 fire cracked rock 29 historic artifacts (brick, glass, nails, ceramics)

TABLE 16(continued)

STRATIGRAPHIC SUMMARY OF TEST PIT 16N,2E

SITE 23SO401

LEVEL	DEPTH BELOW SURFACE	EXCAVATION DIMENSIONS	MATERIALS RECOVERED
3	40-50 cm	1 x 2 m	1 Neeleys Ferry Plain sherd 2 Barnes Cord Marked sherds 3 fired clay 1 biface 1 flake tool 1 ground stone tool 1 core 57 debitage 5 fire cracked rock
4	50-60 cm	1 x 1 m	3 fire cracked rock

material was recovered below 40 centimeters. In addition, floral and faunal remains were recovered from the test pit, including bone fragments, shell, and charcoal.

The prehistoric artifact assemblage from 23SO401 includes bifaces, flake tools, a blade tool, cores, debitage, ground stone tools, manuports, composite tools, fire cracked rock, ceramics, and fired clay. Only one diagnostic biface was identified in the collection, a point fragment (Plate 8:K) which resembles a Ledbetter point (Kneberg 1956). This point and the substantial amount of fire cracked rock in the assemblage suggest a Late Archaic occupation of the site (House 1975b:156). Ceramics in the collection include Barnes Plain, Barnes Cord Marked (Plate 9:C), Neeleys Ferry Plain, Wickliffe Thick, and Buckskull-like sherds. The Barnes Plain and Barnes Cord Marked sherds are Woodland Period indicators while the Neeleys Ferry Plain and Wickliffe Thick ceramics are Mississippian diagnostics. The Buckskull-like sherds (Plate 9:D, I) are similar to the Buckskull ceramic type defined by Price, Price and Harris (1976:42). They are characterized by a micaceous sand, shell, and grog tempering with both cord marked and plain surface treatments. The combination tempering suggests that their temporal position would be during the Woodland to Mississippian transitional period.

The historic artifact assemblage includes window glass, bottle glass, brick fragments, wire nails, machine cut nails, stoneware ceramics, a rimlock keyhole plate, a metal suspender clip, a beltbuckle, and a plastic button. It also includes several rosehead hand-wrought nails (Plate 10:A) which were commonly used in building construction through the 19th century (Nelson 1968). A large spike (Plate 10:B) recovered from the test excavation could have been used in the construction of a heavy framed building or it may have been intended for use in laying railroad tracks. The 1848 General Land Office plat indicates at this location a structure labeled "Howard's" adjacent to a small cultivated field just to the north. Subsequent maps of the area dating from 1932, 1954, and 1965 do not show a structure at this spot. The cartographic data and the presence of rosehead hand-wrought nails in the assemblage suggest that the historic component at 23SO401 is the remains of an isolated farmstead occupied during the mid-19th century.

23SO402

This prehistoric site is located on a low rise in a plowed field adjacent to the St. Francis River. During the initial walkover, a scatter of lithic artifacts was observed over an area of approximately 15 x 40 meters. During the initial examination of the site, a substantial amount of charcoal was observed in the field. Apparently the area has only recently been cleared of forest as a 1968 aerial photograph (Corps of Engineers Map File 41H/55.2(3)) shows a tree cover in this area. When the crew returned for site examination procedures, it was determined that the site is completely outside of the right-of-way. Therefore, no further work was done. There is insufficient data to determine the chronological position or functional nature of the site.

23S0403

This site is located in a cultivated field adjacent to the St. Francis River and contains evidence of both prehistoric and historic activities. During the initial walkover, a scatter of prehistoric lithic and ceramic materials was observed over an area of approximately 30 x 50 meters. Historic materials present at the site include ceramics, glass, and shotgun shells. When a crew returned to the site to conduct an intensive site examination it was determined that the site area was entirely outside of the right-of-way, so no further work was done at the site. There is insufficient data to determine the site's chronological or functional characteristics.

23S0404

This historic site is located in a wooded area adjacent to the St. Francis River on its left descending bank. The site consists of several piles of scrap planks and sawdust. There was no field evidence of structural remains and there is no cartographic evidence of a structure at this location. The material is probably waste from a recent temporary lumbering industry.

23S0405

This historic site is located on the border of a cultivated field and a wooded area on the left descending bank of the St. Francis River. Historic materials including bottle glass, ceramic fragments, a refrigerator, a washing machine, nails, a door, bed springs, and corrugated sheet metal were concentrated in an area measuring approximately 8 x 10 meters. There is a structure indicated at this location on the 1956 topographic map. The site is probably the remains of a former domestic structure occupied in the mid-20th century.

23S0406

This historic site is located in a heavily wooded area on the left descending bank of the St. Francis River. A pile of weathered wooden planks and rough cut logs was observed approximately three meters from the topbank of the river, but no structural remains were associated with the site. There is no cartographic evidence of a structure at this location. The material is probably waste products from a recent temporary lumbering industry.

23S0407

This prehistoric site is located in a cultivated field approximately 50 meters from the St. Francis River. During the initial walkover, a scatter of lithic materials was observed over an area measuring roughly 10 x 15 meters. After a preliminary examination of the site, a datum was left so that a crew could return for intensive site examination procedures. Upon return to the site, the crew established its location and determined that it is entirely outside the project boundary. No further work was done at the site. There is insufficient data to determine the chronological position or functional character of the site.

23S0408

This historic site is located in a densely wooded area near the edge of a plowed field approximately 90 meters from the St. Francis River. The site contains a barrel ring fragment, a piece of iron pipe, and various structural materials such as brick, stone, and concrete. Although there is no cartographic evidence of a structure at this location, the presence of architectural debris in the assemblage suggests that a structure may have occupied this site.

23S0409

This historic site is located in a wooded area near a cultivated field adjacent to the St. Francis River. The site includes piles of scrap lumber and sawdust, but there were no associated structures in the immediate area. There is no cartographic evidence of a structure at this location. The material is probably waste products from a recent temporary lumbering industry.

23S0410

This historic site is located in a cultivated field on the left descending stream bank of the St. Francis River approximately 30 meters from the topbank. A light surface scatter of modern glass and ceramics was observed over an area measuring roughly 5 x 10 meters. There is no cartographic or field evidence of a structure having existed at this location. The material was probably discarded at the site.

23S0411

This historic site is located in a wooded area approximately 300 meters from a dirt road and 23 meters from the topbank of the St. Francis River. Materials including a coil of wire, bottle glass, beer cans, and earthenware ceramics are concentrated in a very small area. There is no cartographic evidence or field evidence of a structure at or near this location. The site appears to be a recently deposited, isolated refuse area.

23S0412

This site is located on a small rise in a cultivated field on the left descending bank of the St. Francis River approximately 40 meters from the topbank and contains evidence of both prehistoric and historic occupations. During the initial walkover survey, a scatter of prehistoric lithics and ceramics was observed together with a small amount of historic material.

When a crew returned to the site for intensive archaeological examination procedures, a grid origin was established in the approximate center of the site. Shovel tests were dug at five meter intervals along the cardinal axes from the grid origin in order to define the site boundaries and locate areas of artifact concentration within the site. Fourteen of the 28 shovel tests yielded cultural

material; however, none contained more than five artifacts. A grid of 10 x 10 meter squares was laid out for controlled surface collection. All visible artifacts were collected from the northeast 2 x 2 meter portion of each grid unit and artifacts were selectively collected from the remainder of the area. The mean surface artifact density, as calculated from the recovery within the 2 x 2 meter units, was fairly high, 0.84 artifacts per square meter. Based on the shovel testing and surface collection results, the site is estimated to cover an area of approximately 50 x 75 meters.

In order to ascertain the subsurface extent of the site, a 1 x 2 meter test pit was placed adjacent to the shovel test which had yielded the highest number of artifacts. Excavation was continued to a depth of 40 centimeters below the surface, being discontinued after one sterile 10 centimeter level was removed. The plowzone in this unit was a medium brown silty clay which extended to a depth of approximately 20 centimeters. The subsoil exhibited a light brown color and a silty clay texture.

Prehistoric and historic materials were mixed in the plowzone, and all cultural material was largely confined to the plow disturbed stratum. Two levels were excavated below the plowzone, but only two pieces of debitage were recovered from the uppermost of these units. A stratigraphic summary of the materials recovered from this test unit is presented in Table 17.

The prehistoric assemblage from 23SO412 includes bifaces (Plate 8:J), flake tools, cores, debitage, a ground stone tool, a composite tool, manuports, fire cracked rock, and ceramics. Identification of diagnostic artifacts in the assemblage indicates that there are several prehistoric occupation components at the site. A lanceolate projectile point (Plate 8:I) has been identified as a Quad-like or possible early Dalton variant that is datable to about 8500 B.C., or the terminal Paleo-Indian Period. There are no other specimens in the collection that are clearly identifiable with defined point types. One side notched point fragment (Plate 8:E) cannot be specifically typed but has been tentatively identified as a Middle Woodland artifact. The ceramics in the collection include Barnes Cord Marked, Barnes Plain, Baytown Plain, Neeleys Ferry Plain, and Buckskull-like sherds (Plate 9:G). The Baytown and Barnes wares are Woodland Period indicators while Neeleys Ferry Plain is a Mississippian diagnostic. The Buckskull-like sherds are characterized by a micaceous sand, shell, and grog tempering with both cord marked and plain surface treatments. They are similar to the Buckskull ware defined by Price, Price and Harris (1976:42). The combination of temper used suggests that their temporal position would be during the Woodland to Mississippian transitional period.

The historic artifact assemblage includes bottle glass, seamless bottle-necks, ceramics, machine cut nails, and a metal object of indeterminate function. The ceramics include stoneware and Albany slipped earthenware. Albany slipped ceramics became popular in the mid-19th century and first appeared on Missouri-German wares around 1860 (Hume 1970:101; van Ravenswaay 1977:460). A fragment of cobalt blue glass, possibly the base of a medicine bottle, was also recovered.

TABLE 17

STRATIGRAPHIC SUMMARY OF TEST PIT 3N, 2E

SITE 23SO412

LEVEL	DEPTH BELOW SURFACE	EXCAVATION DIMENSIONS	MATERIALS RECOVERED
1	0-20 cm	1 x 2 m	8 Neeleys Ferry Plain sherds 7 Barnes Cord Marked sherds 2 Barnes Plain sherds 1 Baytown Plain sherds 33 Buckskull-like sherds 2 bifaces 18 flake tools 1 manuport 1 ground stone tool 185 debitage 24 fire cracked rock 42 historic artifacts (brick, ceramics, bottle glass, unidentifiable metal object)
2	20-30 cm	1 x 1 m	2 debitage
3	30-40 cm	1 x 1 m	sterile

There is an isolated farmstead with an associated field labeled "M. Asher's" on the 1848 General Land Office survey plat for T25N,R8E, and the historic component at 23SO412 may be the remains of that site.

23SO413

This prehistoric site is located approximately 20 meters from the topbank of the St. Francis River near a gravel road. During the walkover, a single lithic artifact was observed whereupon the area was examined for the presence of associated materials. Since no other prehistoric materials were observed, the biface was collected and considere an isolated find. The artifact exhibits bipolar flaking and is made of Crescent Quarry chert but is not culturally diagnostic. The artifact may be out of context since it was found near a gravel road.

23SO414

This historic site is located along a dirt road approximately 50 meters from the St. Francis River. The site contains a group of wooden beams bound with metal cable. The exact function of the material was not ascertained, but it may be the remains of a former bridge which spanned the river or a drainage ditch.

23SO443

This architectural site is located 20 meters from the St. Francis River on the west side of the levee road and contains a deteriorating wooden shed, The structure is composed of planks painted white and a tar papered roof. The owner denied access to the site, thereby preventing photography and detailed data recording. Its date of construction is estimated as post World War II.

23SO444

This architectural site is located on the east riverbank inside the levee road and consists of a deteriorated structure which was apparently designed as a dwelling. The owner denied access to the site, preventing photography and further investigation. Its date of construction is estimated to have been post World War II.

23SO445

This architectural site is located 80 meters east of the St. Francis River and consists of a rectangular, one story frame dwelling and a corrugated metal storage shed. The main structure rests on a concrete block foundation and has a gable roof covered with tar paper and composition shingles. A brick chimney is present. Exterior walls are clad with wooden boards. A one story, two bay porch is inset on the south or entrance side and is protected by a shed roof. Windows are four over four double hung sash. Another dwelling and shed beyond the right-of-way complete the complex. Farm equipment was observed at the site. Estimated to have been constructed in the 1950's, the dwelling is in good condition.

23S0446

This architectural site is located three meters north of the St. Francis River and contains a rectangular, one story frame dwelling and a privy. Wood and sheet rock serve as exterior cladding and the dwelling rests on an open concrete block foundation. The gable roof, with ridge parallel to the long main entrance side, is covered with a composition material. The dwelling is sited parallel to the river. Windows are double hung sash and one paneled door is present. Estimated to have been built in the 1950's, the dwelling has undergone a recent rebuilding. The structures are in excellent condition and still used as a fishing camp.

23S0447

This architectural site is located approximately nine meters east of the St. Francis River and consists of a rectangular one story dwelling. The structure is one of a cluster of similar buildings (23S0448, 23S0449, 23S0450, and 23S0451) which comprise a large fishing camp. It is a frame building with a gable roof that has been extended over a screened porch on the long side facing the river. The exterior walls are board and batten and the roof is covered with corrugated sheet metal. An open foundation of concrete blocks supports the structure. A stove pipe pierces the roof at an interior end and the main entrance appears on one short side, with a second door on a long side. Windows are of both the double hung sash and single stationary pane types. Several fishing boats and picnic tables were observed at the site. The dwelling is in fair condition and is estimated to have been built in the 1950's.

23S0448

This architectural site is located 15 meters east of the St. Francis River and is part of a group (23S0447, 23S0448, 23S0449, 23S0450, and 23S0451) of fishing camp dwellings. The one story frame building at this site rests on an open concrete block foundation and is four bays long. The ridge of the gable roof is perpendicular to the entrance or short side. A doorway occurs in each short side of the building. Corrugated sheet metal covers the roof and the exterior walls are provided with wooden siding. An interior brick chimney appears midway on one long side. Windows are double hung sash with four over four lights. A shed-roofed, screened porch has been added along one long side. A privy, boats, refuse, and farm tools were observed at the site. Estimated to have been built in the 1950's, the dwelling is in good condition.

23S0449

This architectural site is located six meters east of the St. Francis River and is part of a cluster of buildings (along with 23S0447, 23S0448, 23S0450, and 23S0451) used as a fishing camp. The rectangular structure is one story in height and covered with board and batten siding. The shingled, low-pitched gable roof extends over a screened porch on one long side. The ridge of the roof is

perpendicular to the entrances, which are located at both short ends, east and west. A small, open frame porch with a shallow gable roof occurs at one short end. The dwelling rests on concrete blocks and is provided with paneled doors and sash windows. One interior chimney appears at a short end. A privy is associated with the dwelling, and both are in good condition. The date of construction has been placed in the 1950's.

23SO450

This architectural site is located 75 meters east of the St. Francis River in a wooded area and contains a dwelling which, along with a number of similar structures (23SO447, 23SO448, 23SO449, and 23SO451), is part of a fishing camp. The one story, rectangular frame building is covered with wooden boards and sheet rock. It is approximately 7.5 meters long and 3 meters wide. Resting on an open concrete block foundation, the dwelling has a shed roof of extremely low pitch. Roofing rafters are visible on the two long sides of the structure. The entrance is located on the southern long side. Estimated to have been built in the 1950's, the dwelling appears to have been recently rebuilt. Metal, plastic, glass, and assorted fishing equipment were observed at the site.

23SO451

This architectural site is located 80 meters east of the St. Francis River and is the last in a series of similar seasonal dwellings used by fishermen (sites 23SO447, 23SO448, 23SO449, and 23SO450). This square, one story, balloon frame structure rests on pilings and is covered with composition shingle siding. It is approximately 7 meters east-west by 6 meters north-south in dimension. One plane of the gable roof has been extended to protect an enclosed porch. Corrugated sheet metal serves as the roofing material. A small, single bay entry porch or platform is located on the south side near the southeastern corner of the building. Four horizontal sliding, two stationary pane, and two double hung windows are present. Associated with the structure are a privy, an outdoor fireplace, refuse, and farm tools. Estimated to have been built in the 1950's, the dwelling is in good condition and currently under renovation.

23SO452

This architectural site is located approximately 23 meters east of the St. Francis River and 53 meters south of State Road 60 and includes a one story, six bay, pole frame barn. The barn is open-ended; its long sides, north and south, are covered with wooden board sheathing. The roof, which is covered with corrugated sheet metal, is of the gambrel variety. Associated with the barn and to the north beyond the right-of-way are two garage structures and a silo. Farm machinery was observed within and near the barn, indicating its continued use. The pole barn was probably constructed during the 1950's.

23SO453

This architectural site is located eight meters west of the St. Francis River and three meters east of a farm lane and consists of an abandoned shed. The

one story, balloon frame structure sits on a concrete block foundation. Wooden planks cover the exterior walls, and corrugated sheet metal once protected the now collapsed roof. Access to the interior of the structure is provided by a doorway in one short end. A refuse dump was observed nearby. The building is in an extreme state of decay; it was probably built after World War II.

23S0454

This architectural site is located 30 meters east of the St. Francis River and 53 meters north of Route 60. It is a farmstead containing a main house, storage shed, and barn. Access to the farmstead was denied by the inhabitants, preventing detailed data recording. The one story, balloon frame dwelling is L-shaped and rests on a poured concrete foundation. Both arms of the L are covered with shingled gable roofs. A carport is attached to the house at its eastern end. A storage shed and metal barn are located to the north of the dwelling. All structures are in excellent condition and currently in use. They are estimated to have been built in the 1960's.

23S0455

This architectural site is located approximately 50 meters east of the St. Francis River, adjacent to cultivated farm land and contains a dwelling, storage shed, and metal trailer, all within the project right-of-way. The one story, balloon frame, double pen dwelling rests on a concrete block foundation. Exterior walls are covered with a composition sheet siding designed to resemble uncoursed ashlar. The ridge of the gable roof is parallel to the long side of the dwelling; the roofing material is corrugated metal. The house faces and parallels the river. The single entry is located in the center of the western long side. A stove pipe appears toward the center of the structure as well. A low wooden platform aids in use of the entry. There is one double hung window at either side of the entry, one at each short end, and three at the rear of the dwelling. The storage shed is located to the northwest and the trailer to the north of the dwelling. Estimated to have been built during the 1950's, the structure is in good condition.

23S0456

This architectural site is located on the east bank of the St. Francis River and is surrounded by cultivated fields. The site's central feature is a two story, three bay, balloon frame I-house resting on a poured concrete foundation. Weatherboards cover the exterior walls, while composition shingles have been applied to the gable roof. The ridge of the roof parallels the long or entrance side of the dwelling, oriented north-south. A one story rear addition with a central brick chimney provides the house with a T-shaped plan. The main entrance, located in the center of the east side, is protected by a one story, shed roofed porch with turned collonettes. The porch does not extend the entire length of the structure, but terminates prior to shielding the two windows which flank the entrance. Three windows in the second story match the arrangement of

door and windows below. Two windows, one in each story, appear at the short ends. All windows are double hung, with an arrangement of two over two lights. A doorway in one side of the rear addition provides access to what is probably the kitchen. Two storage sheds, a barn, and various agricultural and domestic objects are associated with the dwelling. Estimated to have been constructed in the 1920's, the house is in good condition.

Summary of Prehistoric Resources

The 14 prehistoric sites found in the Wappapello to Crowleys Ridge project area document a temporal range of occupation in the survey area from the late Paleo-Indian Period through the Mississippian Period. Table 18 lists each prehistoric site with its estimated size, ground surface visibility, and chronological position. Nine of the 14 prehistoric sites could not be assigned to a specific period of occupation because no diagnostics were identified in their assemblages or because intensive archaeological examination was not possible.

One site, 23SO412, produced evidence of occupation during the Paleo-Indian Period in the form of a point (Plate 8:I) similar to the Quad point type which was first defined on the basis of excavations in northern Alabama (Soday 1954).

There is evidence of Late Archaic Period occupations at three of the sites in the surveyed area: 23BU210, 23BU214, and 23SO401. A baked clay Poverty Point object (Plate 9:E) was recovered from 23BU210 which may indicate the presence of a component of the O'Bryan's Ridge phase (Webb 1977:7). The Big Creek point (Plate 8:G) suggests an association of site 23BU214 with the Frierson phase (Morse 1970; Morse, Dinwiddie, et al. 1979:2). A point (Plate 8:K) similar to the Ledbetter point type was recovered from site 23SO401. These points are most frequently associated with Late Archaic cultures in the Tennessee River Valley in western Tennessee and Kentucky (Kneberg 1956).

Woodland components have been identified at four sites: 23BU210, 23BU217, 23SO401, and 23SO412. Barnes Plain and Barnes Cord Marked sherds were identified in the assemblages from 23BU210, 23SO401, and 23SO412. These sand tempered ceramics are found in southeastern Missouri and northeastern Arkansas (Phillips 1970). Several sherds with micaceous sand, grog, and shell tempering were recovered from 23BU210, 23SO401, and 23SO412. They are not strictly identifiable with any defined ceramic type, but they are most similar to the Buckskull ceramics defined by Price, Price and Harris (1976:42) on the basis of investigations in the Fourche Creek watershed in southeastern Missouri. One Baytown Plain sherd (Phillips, Ford and Griffin 1951; Phillips 1970) was identified in the ceramic assemblage from 23SO412; Baytown ceramics are most frequently found in the Eastern Lowlands area of southeastern Missouri and in northeastern Arkansas. Scallorn points (Plate 8:A,C) recovered from 23BU210 may be associated with a Late Woodland occupation, but these points are more frequently associated with Mississippian Period occupations (Bell 1960:84-85). A Woodland component is suggested for site 23BU217, based on the observation of sand or grit tempered sherds at the site.

TABLE 18

SUMMARY OF PREHISTORIC SITES

SITE	ESTIMATED SIZE IN SQUARE METERS	GROUND SURFACE VISIBILITY	CHRONOLOGICAL POSITION
23BU208	100	76-100%	Unknown
23BU209	25	76-100%	Unknown
23BU210	1,500	76-100%	Archaic, Woodland, Mississippian
23BU212	10	76-100%	Unknown
23BU214	3,600	76-100%	Archaic, Mississippian
23BU215	1,600	26-50%	Unknown
23BU217	1,200	51-75%	Woodland
23SO400	200	76-100%	Unknown
23SO401	6,500	0-25%	Archaic, Woodland, Mississippian
23SO402	600	76-100%	Unknown
23SO403	1,500	76-100%	Unknown
23SO407	150	76-100%	Unknown
23SO412	3,750	76-100%	Paleo-Indian, Woodland, Mississippian
23SO413	1	0-25%	Unknown

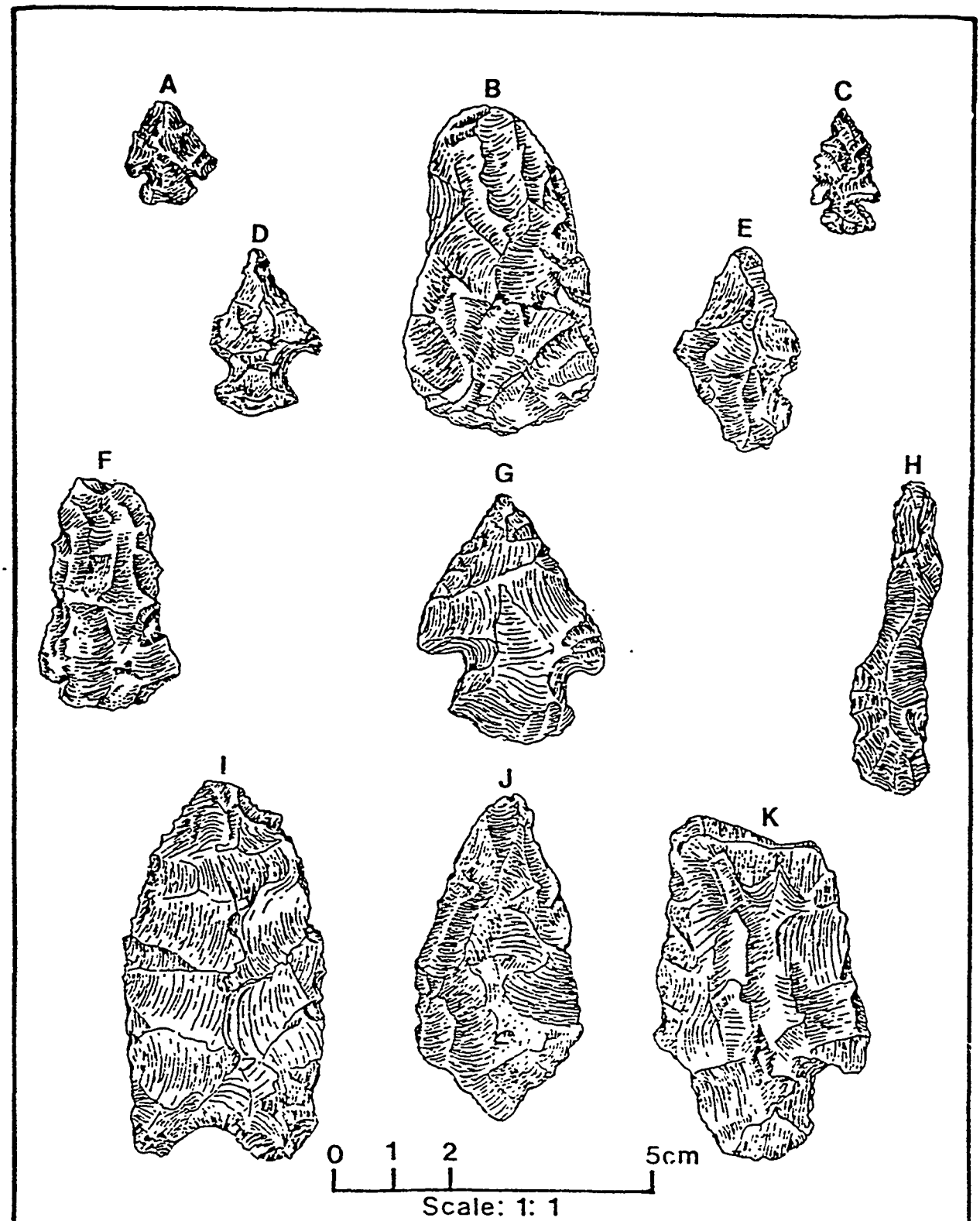


PLATE 8

Chipped stone tools from the Wappapello to Crowleys Ridge Project Area. (A) Scallorn (Mississippian) point from site 23BU210. (B) Knife from site 23BU209. (C) Scallorn point from site 23BU210. (D) Untyped projectile point from site 23BU210. (E) Untyped projectile point from site 23SO412. (F) Possible drill base from site 23SO412. (G) Big Creek (Late Archaic) point from site 23BU214. (H) Drill from site 23SO401. (I) Quad-like (Terminal Paleo-Indian) point from site 23SO412. (J) Biface from site 23SO412. (K) Fragment of a Ledbetter (Late Archaic) point from site 23SO401.

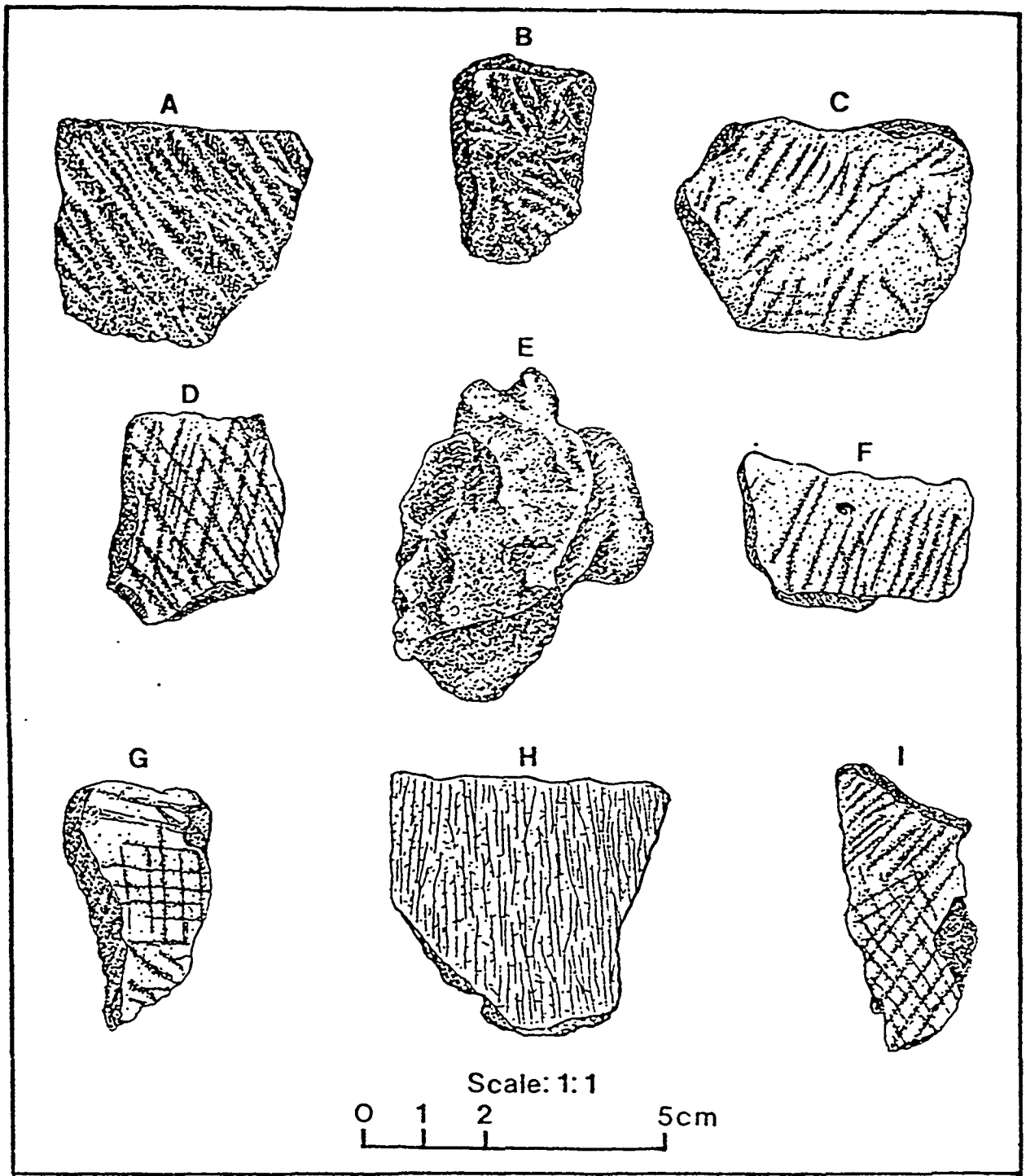


PLATE 9

Ceramic artifacts from the Pappapello to Crowleys Ridge Project Area. (A) Cord marked, grit tempered sherd from site 23BU210. (B) Barnes cord marked sherd from site 23BU210. (C) Barnes smoothed-over cord marked sherd from site 23SO401. (D) Buckskull-like sherd from site 23SO401. (F) Poverty Point object fragment from site 23BU210. (F) Buckskull-like cord marked sherd from site 23BU210. (G) Buckskull-like cord marked sherd from site 23SO412. (H) Buckskull-like cord marked sherd from site 23BU210. (I) Buckskull-like cord marked sherd from site 23SO401.

Mississippian components have been identified at four sites: 23BU210, 23BU214, 23SO401, and 23SO412. Shell tempered Neeleys Ferry Plain sherds (Phillips, Ford and Griffin 1951) have been identified at all four sites. The Wickliffe Thick sherd recovered from 23SO401 is also shell tempered, indicating a Mississippian Period occupation (Phillips 1970). The Buckskull-like ceramics from sites 23BU210, 23SO401, and 23SO412 suggest a Woodland to Mississippian transitional period of occupation, based on their combination of sand, grog, and shell tempering. The two Scallorn points (Plate 8:A,C) from 23BU210 are probably indicators of a Mississippian component (Bell 1960:84-85).

Site functions can be tentatively determined by analysis of the site sizes and artifact assemblages. The sites range in size from one square meter (23SO413) to 6,500 square meters (23SO401). The size estimate of one square meter for 23SO413 is a convention for an isolated find. The mean size of all the inventoried prehistoric sites is 1,595 square meters. Only four sites (23BU214, 23BU215, 23SO401, and 23SO412) are larger than the mean, indicating a positively skewed distribution of site sizes.

Judging site function strictly from site size may be misleading because of variable use of space and different discard practices during prehistory. Almost all sites for which occupation during a certain period can be inferred from diagnostic artifacts have more than one occupational component, a factor which further complicates the assessment of site functions on the basis of site size. Also, recent agricultural disturbance to the sites from plowing and land levelling has disturbed the spatial patterning of the cultural deposits.

Four of the five sites with Woodland or Mississippian components (23BU210, 23BU214, 23SO401, and 23SO412) appear to have had relatively sedentary occupations. The presence of pottery sherds indicates food storage or food preparation activities. The Poverty Point object found at 23BU210 also indicates activity related to food preparation as Poverty Point objects are thought to have been used in cooking (Webb 1977:6). The mean size for these four sites (3,838 square meters) is more than twice as great as the mean size for all sites inventoried in this project. The lithic assemblages recovered from 23BU210, 23BU214, 23SO401, and 23SO412 generally contain a variety of artifact types (see Tables 19 and 20) suggesting a broad range of activities at these sites such as hunting, butchering, plant food processing, and lithic tool manufacture and maintenance. Judging from the characteristics of their artifact assemblages and their sizes, these sites may have had relatively permanent occupations. They might be classified as small hamlets or base camps. All four sites are located on small rises in the floodplain which would have provided some degree of protection from flooding.

Five sites (23BU209, 23BU212, 23BU217, 23SO400, and 23SO413) appear to have been special use sites or temporary occupation sites. These five sites have a mean size of 287 square meters, much smaller than the mean size of 1,595 square meters for all inventoried sites. With the exception of 23BU217, the assemblages of these sites consist only of lithics. Pottery was observed at 23BU217 during the initial walkover survey but not during the subsequent intensive examination

of the site. This site is the largest of the five sites classified as special use or temporary occupation sites. The apparent size of this site may have been significantly influenced, however, by earthmoving equipment in the site area.

Site functions are not suggested for the remaining five sites inventoried in this project because of the limited data available for them. In two cases (23BU208 and 23BU215), the landowners would not allow intensive data recovery, and three sites (23SO402, 23SO403, and 23SO407) were not examined intensively since they were determined to be outside of the project area.

Tables 19 and 20 summarize the systematic and selective artifact collections recovered during the field investigation of the Wappapello to Crowleys Ridge project area. When all cultural material within a strictly defined provenience unit is collected, the collection is considered to be systematic. Therefore, all artifacts which were recovered from shovel tests, test excavations, and intensively collected surface grid units are included in the systematic collection table. The systematically gathered artifact collections total 1,648 artifacts, of which 19.2% is ceramic and 80.8% is lithic material. The selectively recovered collections result from either (1) less than total recovery within a specific provenience unit, such as selective surface collection within defined grid units, or (2) recovery of artifacts outside of a precisely defined spatial provenience unit, such as the collection of an isolated surface artifact. The artifacts included in the selective collections total 170 artifacts. Of these, 5.9% were ceramic and 94.1% were lithic objects.

The ceramic collections recovered during the survey are summarized in Table 21. The most frequently identified (35.5%) ceramic type is Neeleys Ferry Plain which is a shell tempered Mississippian ware. Sand tempered wares, Barnes Plain and Barnes Cord Marked, together comprise 29.7% of the ceramic collections. Approximately 18% of the ceramic assemblage is composed of sherds with micaceous sand, grog, and shell tempering which exhibit both plain and cord marked surfaces. These sherds are listed as "Buckskull-like" in Table 21 since they resemble the Buckskull ceramics defined by Price, Price and Harris (1976:42). Baytown Plain and Wickliffe Thick ceramics are represented in the collections by one sherd of each. A number of sherds are listed as "indeterminate" because their various combinations of tempering, surface treatments, and forms do not closely conform to known types or because these sherds were too fragmentary for positive identification.

The lithic components of the artifact assemblages include bifaces, flake tools, blades, cores, debitage, cobble tools, manuports, fire cracked rock, and composite tools. In the systematically recovered collections (Table 19), debitage accounts for 73.8% of all lithic items, fire cracked rock accounts for 14.7%, flake tools account for 5.4%, bifaces account for 2.5%, and cores account for 2.3%. Other artifact classes each account for less than one percent of the total lithic fraction.

A tabulation of lithic materials according to major artifact classes is presented in Table 22. Local materials account for 65.1% of the lithic

TABLE 19

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: SYSTEMATIC SAMPLE

SITE NUMBER	BIFACES	FLAKE TOOLS	BLADE TOOLS	CORES	DEBITAGE	GROUND STONE	MANUPORTS	MODELED CLAY	MISCELLANEOUS COMPOSITE TOOLS	TOTAL	PERCENT
23BU210	4	6	0	4	74	0	0	62	44 0	194	11.8
23BU214	0	1	0	0	8	0	0	4	0 0	13	0.8
23SO400	0	1	0	0	0	0	0	0	0 0	1	0.1
23SO401	25	32	1	22	629	7	3	194	118 2	1,033	62.7
23SO412	4	32	0	5	271	1	?	57	34 1	407	24.7
TOTAL	33	72	1	31	982	8	5	317	196 3	1,648	
PERCENT	2.0	4.4	0.1	1.9	59.6	0.5	0.3	19.2	11.9 0.2		100%

TABLE 20

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: SELECTIVE SAMPLE

SITE NUMBER	BIFACES	FLAKE TOOLS	BLADE TOOLS	CORES	DEBITAGE	COBBLE TOOLS	MANUPORTS	MODELED CLAY	MISCELLANEOUS	COMPOSITE TOOLS	TOTAL	PERCENT
23BU209	1	0	0	0	1	0	0	0	0	0	2	1.2
23BU210	8	8	0	2	21	5	0	0	0	1	51	30.0
23BU212	1	0	0	0	1	0	0	0	0	0	2	1.2
23BU214	6	13	1	5	48	0	1	3	3	1	81	47.6
23SO400	0	1	0	0	10	0	0	0	0	0	11	6.5
23SO412	9	4	0	2	5	0	1	1	0	0	22	12.9
23SO413	1	0	0	0	0	0	0	0	0	0	1	0.6
TOTAL	26	26	1	9	86	5	2	10	3	2	170	
PERCENT	15.3	15.3	0.6	5.3	50.6	2.9	1.2	5.9	1.8	1.2		100%

TABLE 21

INVENTORY OF PREHISTORIC CERAMIC ARTIFACTS

	SITE					
CERAMIC TYPE	23BU210	23BU214	23S0401	23S0412	TOTAL	PERCENT
Baytown Plain	0	0	0	1	1	0.3
Neeleys Ferry Plain	4	7	97	8	116	35.5
Wickliffe Thick	0	0	1	0	1	0.3
Buckskull-like	6	0	15	37	58	17.7
Barnes Plain	1	0	17	4	22	6.7
Barnes Cord Marked	29	0	38	8	75	22.9
Indeterminate	27	0	26	0	53	16.2
Poverty Point Object	1	0	0	0	1	0.3
TOTAL	68	7	194	58	327	100%

TABLE 22

INVENTORY OF LITHIC MATERIALS

LITHIC MATERIALS	BIFACE	FLAKE TOOL	BLADE	CORE	DEBITAGE	GROUND STONE	COBBLE TOOL	MANUPORT	FIRE CRACKED ROCK	COMPOSITE TOOL	TOTAL	PERCENT
rhyolite	0	0	0	0	6	0	0	0	1	0	7	0.5
siltstone	0	0	0	0	2	0	0	0	0	0	2	0.1
sandstone	0	0	0	1	160	4	2	1	13	0	181	12.1
ironstone	0	0	0	0	0	0	0	2	0	0	2	0.1
quartzite	12	19	0	13	274	1	2	0	9	1	331	22.2
chalcedony	1	2	0	1	1	0	0	0	0	0	5	0.3
Crowleys Ridge chert	11	36	0	12	261	0	1	2	114	2	439	29.4
Pitkin chert	1	2	0	0	4	0	0	0	0	0	7	0.5
chert breccia	0	0	0	0	0	0	0	1	0	0	1	0.1
oolitic chert	1	1	0	0	20	0	0	0	1	1	24	1.6
Crescent Quarry chert	11	11	0	2	84	0	0	0	9	0	117	7.8
Dover chert	0	1	0	0	2	0	0	0	0	0	3	0.2
Burlington chert	8	12	0	1	69	0	0	0	1	0	91	6.1
Mill Creek chert	1	0	0	2	1	0	0	0	0	0	4	0.3
quartz	0	0	0	0	0	0	0	1	0	0	1	0.1
unidentified cherts	13	14	2	8	181	3	0	0	51	1	273	18.3
hematite	0	0	0	0	1	0	0	0	0	0	1	0.1
petrified wood	0	0	0	0	2	0	0	0	0	0	2	0.1
TOTAL	59	98	2	40	1,068	8	5	7	199	5	1,491	
PERCENT	4.0	6.6	0.1	2.7	71.6	0.5	0.3	0.5	13.3	0.3		100%

assemblages while exotic materials account for 34.9% of the collections. Materials which are considered to be locally available include rhyolite, siltstone, sandstone, ironstone, quartzite, chalcedony, Crowleys Ridge chert, hematite, and petrified wood. Materials which are considered exotic to the area include Pitkin chert, chert breccia, oolitic chert, Crescent Quarry chert, Dover chert, Burlington chert, Mill Creek chert, quartz, and unidentified cherts. Exotic materials are represented most frequently in the biface, flake tool, and debitage categories.

Potential source areas for the inventoried lithic materials are found in the states of Arkansas, Illinois, Missouri, Tennessee, and possibly Oklahoma and Iowa. Crowleys Ridge chert which accounts for the greatest proportion of the collections is available from gravels in stream bottoms in and near Crowleys Ridge which separates the Eastern and Western Lowlands of northeastern Arkansas and southeastern Missouri (Morse 1969:15). Pitkin chert is available from outcrops in the Arkansas Ozarks and at some locations in Oklahoma; the known source of Pitkin chert nearest to the project area is near the town of Batesville, Arkansas on the Ozark Escarpment in Independence County (House 1975c:85-90; Morse and Million 1977:15-27). The nearest known source of chert breccia, also known as Everton Breccia, is also near the town of Batesville, Arkansas on the Ozark Escarpment (Klinger and Mathis 1978). Oolitic chert is available from outcrops in the Ozark Escarpment as well (Manger 1976:209-211). Crescent Quarry chert or Crescent Hills chert is found over a large area in Jefferson County near St. Louis, Missouri (Ives 1976:142). Dover chert is available from outcrops near the town of Dover in Stewart County, Tennessee (Faulkner and McCollough 1973:57; Morse and Million 1977:15-24). Extensive outcrops of Burlington chert occur in the Lower Illinois River Valley, but this material is widely distributed in Illinois, Missouri, and Iowa (Meyers 1970). The known source of Mill Creek chert nearest to the project area is in Union County, southern Illinois (Morse and Million 1977:15-24).

Summary of Historical and Architectural Resources

The 23 historical archaeological sites inventoried during the survey of the project area are summarized in Table 23, and the artifact assemblages associated with these sites are summarized in Table 24. A variety of site types are represented in the inventory although most are products of the 20th century. The most common type of recorded historic site is a refuse area or dump not associated with an identified industrial or occupation area. Many of the refuse areas contain a variety of artifact types. Five sites were identified as loci of temporary lumber extraction areas. These sites generally contain a limited variety of artifactual material and were identified by the presence of waste products such as sawdust and scrap lumber. Three sites were classified as farmsteads or domestic sites, and two of these sites have probable 19th century occupational components, based on artifactual and cartographic evidence.

TABLE 23

SUMMARY OF HISTORICAL ARCHAEOLOGICAL SITES

SITE TYPE	FREQUENCY	SITE NUMBER
Refuse areas or dumps not associated with domestic or industrial activity.	9	23BU205 23BU207 23BU215 23BU216 23BU217 23SO398 23SO408 23SO410 23SO411
Lumber extraction industrial area.	5	23BU213 23SO400 23SO404 23SO406 23SO409
Fishing camp.	1	23BU211
Agricultural activity.	2	23BU206 23BU228
Nineteenth century isolated farmstead.	2	23SO401 23SO412
Twentieth century domestic site.	1	23SO405
Unknown.	3	23BU210 23SO403 23SO414
TOTAL	23	

TABLE 24

PRESENCE AND ABSENCE OF ARTIFACT DATA AT HISTORIC SITES*

ARTIFACT SUB-CLASSES	SITE											
	23BU205	23BU206	23BU207	23BU210	23BU211	23BU213	23BU215	23BU216	23BU217	23BU228	23SO398	23SO400
1a	1	0	0	0	1	0	0	1	1	1	0	1
1b	1	0	0	0	0	0	0	0	0	0	0	0
1c	1	0	1	1	0	0	0	0	1	0	0	1
2a	1	0	0	0	0	0	0	0	1	0	0	0
2b	1	0	0	0	0	0	0	0	0	0	0	0
2c	1	0	1	1	0	0	1	0	1	0	0	1
2d	1	0	0	0	0	0	0	0	0	0	0	1
2e	0	0	0	0	1	0	0	0	0	0	0	0
2f	1	0	0	0	0	0	1	0	0	0	0	0
3a	0	0	0	0	0	0	0	1	0	0	0	0
3b	0	0	0	0	0	0	0	0	0	0	0	0
4a	0	0	0	0	0	0	0	0	0	0	0	0
4b	1	0	0	0	0	0	0	0	0	0	0	0
4c	0	0	0	0	0	1	0	0	1	0	0	0
5a	1	1	1	1	0	0	0	1	0	0	1	1
5b	0	0	0	0	0	0	0	0	0	0	0	0
6a	0	0	0	0	0	0	0	0	0	0	0	0
6b	0	0	0	0	0	0	0	0	0	0	0	0
6c	0	0	0	0	0	0	0	0	0	0	0	0
6d	1	0	0	0	0	0	0	0	0	0	0	0

*Artifact classes and sub-classes are defined in Table 6.

1 = Present

0 = Absent

TABLE 24(continued)

PRESENCE AND ABSENCE OF ARTIFACT DATA AT HISTORIC SITES*

ARTIFACT SUB-CLASSES	SITE										
	23S0401	23S0403	23S0404	23S0405	23S0406	23S0408	23S0409	23S0410	23S0411	23S0412	23S0414
1a	0	1	0	0	0	0	0	0	1	0	0
1b	0	0	0	0	0	0	0	0	0	0	0
1c	1	1	0	1	0	0	0	1	1	1	0
2a	0	0	0	0	0	0	0	0	0	0	0
2b	0	0	0	0	0	0	0	0	0	0	0
2c	1	0	0	1	0	0	0	1	1	1	0
2d	0	0	0	0	0	0	0	0	0	0	0
2e	0	0	0	0	0	0	0	0	0	0	0
2f	0	0	0	0	0	0	0	0	0	0	0
3a	1	0	0	0	0	0	0	0	0	0	0
3b	1	0	0	0	0	0	0	0	0	0	0
4a	0	0	0	0	0	0	0	0	0	0	0
4b	1	0	0	0	0	1	0	0	0	0	0
4c	0	0	1	0	1	0	0	0	0	0	1
5a	1	0	0	1	0	1	0	0	0	1	0
5b	0	0	0	1	0	0	0	0	1	1	0
6a	1	0	0	0	0	0	0	0	0	0	0
6b	0	0	0	0	0	0	0	0	0	0	0
6c	0	0	0	0	0	0	0	0	0	0	0
6d	0	0	0	0	0	0	0	0	0	0	0

*Artifact classes and sub-classes are defined in Table 6.

1 = Present

0 = Absent

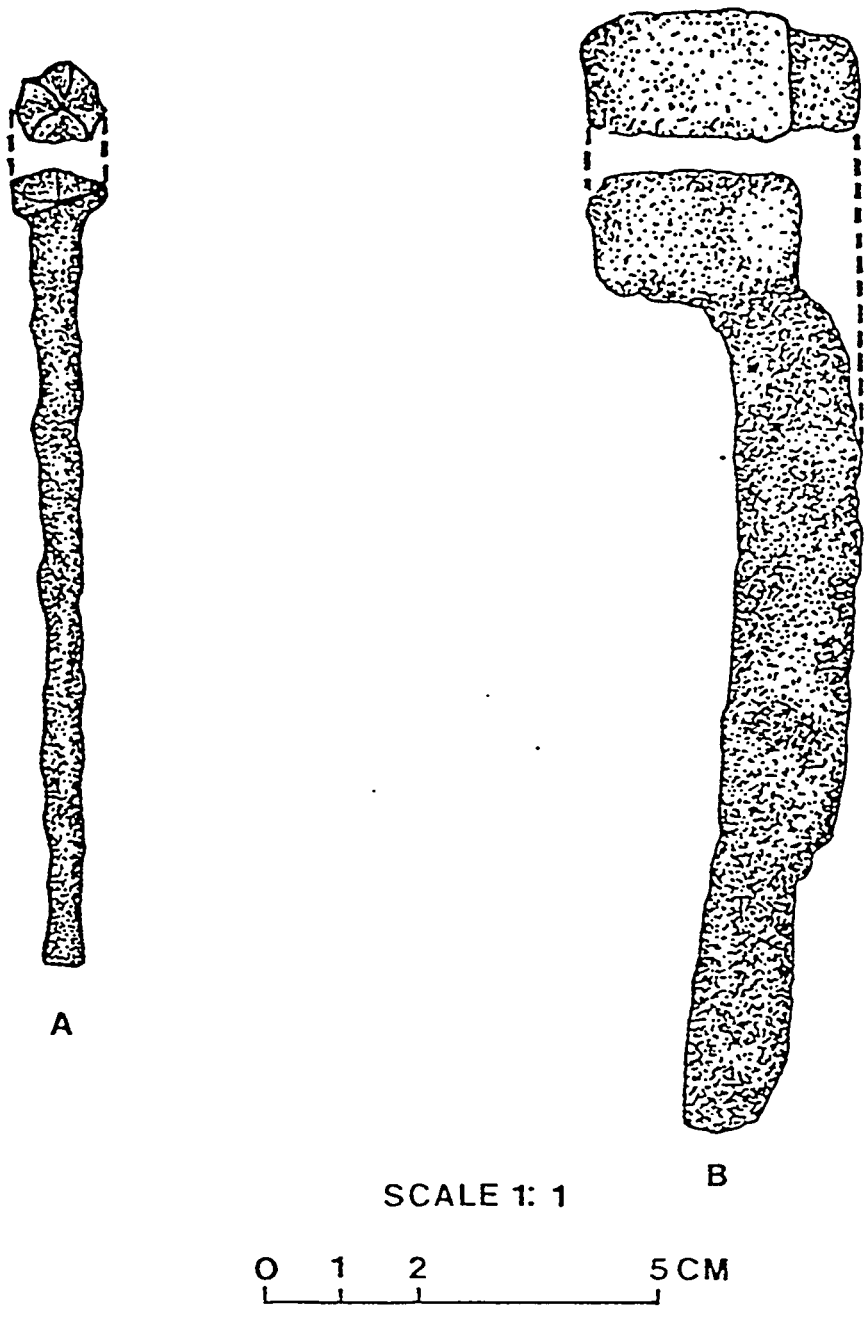


PLATE 10

Hand wrought nail and spike from site 23SO401. The "rose head" (A) is typical of nails employed in American building construction through the 19th century. Large nails designed to withstand great stress, such as the L-head spike (B), continue in use to this day.

TABLE 25

ARCHITECTURAL SITE SUMMARY

FUNCTION	STRUCTURE TYPE	ESTIMATED DATE OF CONSTRUCTION	FREQUENCY	SITE NUMBER	TOTAL
Recreational Dwelling	Balloon Frame, Rectangular, One Story, Open Foundation, Flat Roof, Entrance on Long Side	after 1945	1	23BU218	13
		1950's	1	23SO450	
	Balloon Frame, Rectangular, One Story, Open Foundation, Gable Roof, Entrance on Long Side	1930's	1	23BU219	
		1950's	1	23SO446	
		1950's	1	23SO451	
	Balloon Frame, Rectangular, One Story, Open Foundation, Gable Roof, Entrance on Short Side	1950's	1	23SO447	
		1950's	1	23SO448	
		1950's	1	23SO449	
		after 1945	1	23SO453	
		1950's	1	23BU227	
	Metal Frame, Rectangular, House Trailer	after 1945	1	23BU222	
		1950's	2	23BU223	

TABLE 25 (continued)

ARCHITECTURAL SITE SUMMARY

FUNCTION	STRUCTURE TYPE	ESTIMATED DATE OF CONSTRUCTION	FREQUENCY	SITE NUMBER	TOTAL
Dwelling	Balloon Frame, Rectangular, One Story, Gable Roof	1950's	1	23SO445	10
	Balloon Frame, Rectangular, One Story, One Room Deep, Shed Roof	1930's	1	23BU225	
	Balloon Frame, Double Pen, Single Entrance	1970's 1950's	1 1	23BU220 23SO455	
	Balloon Frame, L-Shaped, One Story, Gable Roof	1960's 1960's	1 1	23SO454 23BU226	
	Balloon Frame, I-House, Gable Roof, One Story Rear Addition	1920's	1	23SO456	
	Not Recorded	after 1945 1950's 1960's	1 1 1	23SO444 23SO445 23BU226	

TABLE 25 (continued)

ARCHITECTURAL SITE SUMMARY

FUNCTION	STRUCTURE TYPE	ESTIMATED DATE OF CONSTRUCTION	FREQUENCY	SITE NUMBER	TOTAL
Barn	Pole Frame, Open Ended, Gambrel Roof	1950's	1	23SO452	3
	Metal Construction	1960's	1	23SO454	
	Not Recorded	1920's	1	23SO456	
Silo	Not Recorded	1950's	1	23SO452	1
Animal Shelter	Split Log and Lumber Shed with Single Slope Roof	after 1945	2	23BU221	3
	Pole Frame, Gable Roofed Shed with Wire-fenced Pen	1950's	1	23BU224	

TABLE 25 (continued)

ARCHITECTURAL SITE SUMMARY

FUNCTION	STRUCTURE TYPE	ESTIMATED DATE OF CONSTRUCTION	FREQUENCY	SITE NUMBER	TOTAL
Storage Shed	Balloon Frame	after 1945	1	23SO443	15
	Metal Construction	1950's	1	23SO445	
			1	23BU227	
	Not Recorded	after 1945	1	23BU218	
		1950's	1	23SO445	
		1950's	2	23SO452	
		1960's	1	23SO454	
		1950's	1	23SO455	
		1920's	2	23SO456	
		1960's	4	23BU226	
Privy	Not Recorded	after 1945	1	23BU218	7
		1930's	1	23BU219	
		1950's	1	23SO446	
		1950's	1	23SO448	
		1950's	1	23SO449	
		1950's	1	23SO451	
		1960's	1	23BU226	
GRAND TOTAL					52

The earliest historic occupation of the area occurred during the 19th century with the arrival of American and European settlers. The farm of Martin Ascher (23SO412) who was probably one of Missouri's many immigrants from Germany is marked on the General Land Office survey plat of the area for 1848, as is Howard's farmstead (23SO401). While early pioneers like Ascher and Howard had established farms by the middle 19th century, most of the development of the region did not occur until after the Civil War. During the 40 years after the war, timber companies, railroad interests, and drainage projects were established and left their impact on the area.

Since World War I, the region's greatest economic emphasis has been on the intensive cultivation of cash crops, first cotton and now soybeans. As a consequence, the historic resources in the 20th century have been associated with agricultural and, to a lesser degree, timber interests. Along the river there has also been some focus on recreational activity as reflected in the several remnants of fishing camps found in the area.

Table 25 summarizes the architectural sites that were discovered in the project area. As expected, no examples of formal architectural design were found. Two identifiable double pens and the numerous one story, frame dwellings are indicative of the spatial and constructional choices characteristic of the project area. The presence of the two story I-house indicates some degree of prosperity, which is particularly apparent against the backdrop of less sophisticated structures. The I-house (23SO456) found in the project area has been tentatively dated to the 1920's and appears to be unique in its immediate surroundings. The barns, sheds, pens, and silo associated with a number of the permanent dwellings clearly express the area's rural agricultural character.

All extant structures were built after World War I, a construction period coincident with the agricultural development that followed the success of drainage projects in the area. Moreover, the dating of all structures, with the exception of the I-house and associated building at site 23SO456, to the years following World War II indicates the relatively recent active settlement of the Wappapello to Crowleys Ridge region.

The project area thus appears to have been marginal to the main centers of occupation of the region during the period of Euro-American settlement. It served to support the recreational needs and economic interests of people living outside the immediate project area while supporting a small local population.

RECOMMENDATIONS

Significance of the Resources

The following discussion on the significance of the cultural resources inventoried during the field survey of the Wappapello to Crowleys Ridge Project is based on the criteria for evaluation of cultural properties for inclusion in

the National Register of Historic Places. The Advisory Council on Historic Preservation has established the following criteria of significance:

> National Register criteria for evaluation. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history (Code of Federal Regulations, Title 36, Chapter I, Part 60.6).

The literature search, archival review, cartographic review, interviews, and field investigations have yielded no evidence that any of the inventoried sites can be associated with significant events or important persons in local, regional, or national history. None of the architectural sites identified during the survey have been deemed to embody sufficient architectural merit or craftsmanship to justify a nomination to the National Register under criterion "c". In summation, none of the sites that have been inventoried qualify for inclusion in the National Register of Historic Places under criteria "a", "b", or "c" listed above.

Three of the sites (23BU210, 23S0401, and 23S0412) contain archaeological deposits of sufficient importance to determine that they should be considered potentially eligible for inclusion in the National Register under criterion "d". This criterion implies that the data base at a significant cultural resource site can contribute important information to the understanding of prehistory or history.

At the time of the field survey, several stretches of the planned right-of-way could not be surveyed (Table 26) because the government had not yet obtained legal right of entry and the landowners would not allow the crews to survey the land. These areas encompass a total of 5.25 kilometers (3.26 miles) of the total right-of-way. It is recommended that an intensive survey for cultural resources be undertaken in these areas to determine if significant sites are present and if they will be adversely impacted by the project. The estimated cost of such a survey is $5,000 and the time required for the field investigations is one week.

TABLE 26

UNSURVEYED AREAS BEYOND THE PRESENTLY OWNED

RIGHT-OF-WAY, WAPPAPELLO TO CROWLEYS RIDGE PROJECT

COUNTY	COE MAP	STATION
Stoddard	41H/190.2 Drawing No. 5	1393+07 to 1420+00
Butler	41H/190.2 Drawing No. 5 and 41H/191.3 Drawing No. 6	1506+00 to 1638+17
Butler	41H/191.3 Drawing No. 6	1709+50 to 1722+77

In addition, three sites (23SO402, 23SO403, and 23SO407) were determined to be outside the project area. Two other sites (23BU208 and 23BU215) were not fully evaluated because the landowners would not allow the sites to be tested. Therefore, the significance of these sites cannot be addressed at present. Because sites 23BU208 and 23BU215 may be affected by the project, it is recommended that the Corps of Engineers make a final attempt to secure permission for evaluation of the sites and then sponsor the necessary site examination, if possible. The landowners may be more willing to allow archaeological examinations on their land after crops have been harvested in the fall. The recommended site examination should include controlled surface collecting and test pitting, and a report should be prepared summarizing the field investigations and laboratory analysis and evaluating the sites relative to the criteria of eligibility for the National Register of Historic Places. The estimated cost to evaluate 23BU208 and 23BU215 is $3,700 and the time required for the field investigations is one week.

None of the architectural resources are considered to be potentially eligible for the National Register since these resources are generally of rather recent construction and do not represent outstanding examples of housing types or architectural styles. The most important architectural details have been systematically recorded during the survey: structure type; construction materials; roof shape; number of stories; type of foundation; material, number, and location of chimneys; number, type, and construction of windows; physical condition; associated buildings; and estimated date of construction.

With the exception of sites 23SO401 and 23SO412, none of the historic archaeological components are considered potentially eligible for the National Register. The historic archaeological resources which are not considered potentially eligible for the National Register are primarily related to recent activity in the area, have limited artifact content, have been extremely disturbed by agricultural activity, and lack intact structural features such as foundations. Each site's location, size, and artifact assemblage have been recorded.

The prehistoric resources which are not considered potentially eligible for the National Register are those whose integrity has been severely disturbed by agricultural or prior construction activity and those with extremely limited data potential. Information relating to each site's location, size, and artifact assemblage has been systematically recorded during the field survey and laboratory analysis phases of the present project.

The three sites which are considered eligible for inclusion in the National Register are discussed in the following paragraphs.

23BU210

Site 23BU210 is located on a low rise in the floodplain of the St. Francis River approximately 80 meters from the present topbank of the river. The site

area is currently used for agriculture, and there is no record of the site prior to its discovery during the present survey project.

The site is not particularly large, covering an area of approximately 1,500 square meters. Cultural materials present at the site include prehistoric lithics and ceramics and a small amount of historic material. Artifacts recovered from the site include prehistoric bifaces, flake tools, cores, debitage, ceramics, cobble tools, fire cracked rock, historic bottle glass, nails, and miscellaneous metal objects. Diagnostic artifacts in the collection indicate occupation of the site during the Archaic, Woodland, and Mississippian Periods. Although the site has been disturbed by plowing, a midden deposit is indicated by a darker soil color and an area of densely concentrated artifactual and organic debris. Based on the presence of midden, the variety of artifacts in the assemblage, and the topographic setting of the site, it is likely that the site was utilized as a base camp or small hamlet during prehistory.

The significance of 23BU210 lies chiefly in its potential to provide information concerning the occupation of the region during the prehistoric period, although there is evidence of an historic occupation at the site. The site contains evidence of semi-sedentary or fully sedentary occupations with good preservation of organic remains and has the potential to furnish information regarding prehistoric subsistence and community organization from both synchronic and diachronic perspectives.

The Late Archaic Period artifact found at 23BU210 is a Poverty Point object, in the form of a small lump of baked clay. Poverty Point is a large site in northeastern Louisiana, consisting of a series of mounds and concentric ridges. It belongs to a group of sites in the lower Mississippi Valley which represent the most complex form of socio-political organization known in North America during the Late Archaic Period (Webb 1968; 1977). Baked clay objects are found in abundance at the Poverty Point site and are believed to have been used as heated briquettes in earth ovens. A Poverty Point related complex has been located in the southeastern Missouri O'Bryan's Ridge phase, and individual Poverty Point sites, though rare, have been located in northeastern Arkansas (Webb 1977:Figure 1). Thus, investigation of Poverty Point related materials at 23BU210 could clarify the nature of this Late Archaic manifestation in southeastern Missouri, the relatively distant northern extension of its distribution. An understanding of the nature and development of Poverty Point culture in general is a crucial factor in determining whether complex societies in the southern United States are an autochthonous development or the result of influences from Mexico.

Understanding the transition from the relatively simple village communities of the Woodland Period to the complex settlement pattern and socio-political organization of the Mississippian Period is a major research goal of archaeologists working in the central Mississippi Valley. Traditionally, the advent of the Mississippian Period has been hallmarked by the use of ground shell as a tempering agent for pottery. However, the Buckskull ceramics type defined by

Price, Price and Harris (1976) has been found in association with Late Woodland points and lithic assemblages in surface collected sites in southeastern Missouri. Buckskull ceramics have mixed shell and sand tempering with some examples also having limestone or grog included as a tempering agent. Shell tempering may thus have originated in the Late Woodland Period, not receiving full development until later times. The presence of Buckskull-like sherds in combination with Barnes and Neeleys Ferry ceramic types at 23BU210 indicates strongly that the site may be a Late Woodland to Early Mississippian transition site. Thus, this site has potential to provide data that will define technological and socio-political changes that occurred during the transition from the Woodland to the Mississippian Period.

23SO401

This site is located on a low rise in the floodplain of the St. Francis River. The site is approximately 15 meters from the topbank of the river, and it is in a cultivated field. There is no record of the site prior to its discovery during the present survey project.

The site covers an area of approximately 6,500 square meters. Materials present at the site include prehistoric lithics and ceramics as well as historic materials. The prehistoric assemblage includes bifaces, flake tools, a blade tool, cores, debitage, ground stone tools, and unmodified stone. The historic assemblage includes window glass, bottle glass, brick, miscellaneous architectural items, and articles related to clothing. In addition, organic remains in the form of bone, shell, and charcoal have been preserved at the site. Subsurface testing has revealed materials to a maximum depth of 60 centimeters, but the prehistoric and historic deposits have been well mixed in the upper horizon of the site.

Diagnostic artifacts in the collection indicate prehistoric occupation of the site during the Archaic, Woodland, and Mississippian Periods. Based on the site's relatively large size, the density of occupational debris, and the variety of artifacts in the assemblage, the site was probably used as a base camp or small hamlet during prehistory. Artifactual and cartographic evidence indicates that the historic component is related to occupation of an isolated farmstead during the mid-19th century.

The site's significance is related to the fact that it may provide information regarding local and regional history and prehistory.

Site 23SO401 is the largest prehistoric site located in the project area and appears to have been intensively occupied at numerous times during prehistory. Because organic remains have been well preserved at the site, further scientific study of the site may furnish information regarding prehistoric subsistence and diet. The site was probably occupied relatively permanently, so there is a likelihood that structural remains exist at the site. The site may therefore provide information regarding the spatial organization of prehistoric commun-

ities. A variety of lithic materials is present in the artifact assemblage, and many of these materials appear to be exotic to the immediate area. A careful analysis of them might furnish information which could be used to define regional trading networks or interaction spheres during various periods of prehistory.

A variety of prehistoric ceramic types have been recovered from the site including sand tempered Barnes Plain and Barnes Cord Marked types and shell tempered Neeleys Ferry Plain and Wickliffe Thick types. In addition, a number of untyped sherds with sand, grog, and shell tempering were recovered and have been classified as "Buckskull-like". The sand tempered Barnes wares are generally recognized as Woodland Period diagnostics and shell tempered pottery has been the traditional marker of the Mississippian Period. The combination of tempering agents in the Buckskull-like sherds suggests that they are a transitional form between Late Woodland and Early Mississippian ceramic types. The early Mississippian Period was a time of significant change in southeastern Missouri when relatively simple village life gave way to a regionally oriented system in which small communities were linked by political, religious, and economic bonds to large communities. Because 23SO401 was occupied during the Woodland and Mississippian Periods, it may furnish information regarding the technological and socio-political changes that occurred during the transition from the Woodland Period to the Mississippian Period.

The historic component at 23SO401 represents one of the few identified 19th century occupations in the southeastern Missouri Lowlands. During the historic period, this area was settled later than the nearby Ozarks because of its swampy and generally inhospitable nature. However, the lowland soils were well suited to agriculture and this may have induced the first permanent settlement in the St. Francis Lowlands. The proximity of the St. Francis River was probably an important factor in the location of the pioneer farmsteads in the area since the river would have provided the initial transportation route through the region. The site can therefore provide information regarding the lifeways which characterized the pioneer settlements in the St. Francis Lowlands.

23SO412

This site is located on a low rise in the floodplain of the St. Francis River, approximately 40 meters from the topbank. At the time of its discovery and archaeological examination, the field was under active cultivation. There is no record of the site prior to its discovery during the present survey project.

The site covers an area of approximately 3,750 square meters. Cultural material at the site includes prehistoric lithics and ceramics and historic materials. The prehistoric artifact assemblage includes bifaces, flake tools, cores, debitage, a ground stone tool, manuports, fire cracked rock, and ceramics. The historic materials at the site include bottle glass, ceramics, nails, and miscellaneous metallic objects. Subsurface testing revealed that the cultural deposit is fairly shallow and nearly all of the artifacts recovered during testing were from a plow disturbed context. However, given the large size of the

site and its setting in a floodplain, there is a good possibility that buried, intact subsurface features do exist at the site.

Diagnostic artifacts in the collection indicate prehistoric occupation of the site during the Paleo-Indian, Woodland, and Mississippian Periods. Based on the density of occupational debris at the site and the presence of ceramics, the site was probably occupied on a fairly permanent basis during the Woodland and Mississippian Periods. The historic component at the site has been identified as the remains of a 19th century isolated farmstead. The General Land Office Survey plat of 1848 indicates a small cultivated field and dwelling at this location belonging to M. Ascher, who was probably one of the many German immigrants who established farms in southeastern Missouri in the 19th century.

The significance of site 23SO412 is derived from its ability to furnish information regarding local and regional prehistory and history.

Evidence of the earliest known occupation of the project area was found at site 23SO412. A lanceolate projectile point recovered from the site has been identified as a Quad-like point or possibly an early Dalton variant that is datable to about 8500 B.C., the Late Paleo-Indian or Early Archaic Period. The discovery of a point resembling the Quad point type is notable in that its provenience is west of the general area in which Quad points are normally found (Bell 1960). The nature of the Late Paleo-Indian (Dalton) settlement pattern is an active research topic among regional scholars (Morse 1971a, 1971b, 1975a, 1975b; Price and Krakker 1975; Schiffer 1975), and further study of the site may contribute information to this research topic.

The co-occurrence of Barnes, Baytown, and Buckskull-like ceramics at this site presents an opportunity to investigate the cultural changes that occurred during the transition from the Woodland Period to the Mississippian Period. Morse (1977) has suggested that the relatively simple cultures of the people who made Barnes pottery were amalgamated into the more complex society associated with Baytown ceramics during the Late Woodland Period. Since 23SO412 is the only site in the survey area from which Baytown ceramics were recovered, the site appears to present a unique opportunity to test Morse's hypothesis.

The artifact collection from site 23SO412 also contains the highest number of Buckskull-like sherds in the project area. These sherds, characterized by a mixture of sand, grog, and shell tempering, probably represent a transition from the Late Woodland to the Early Mississippian ceramics types. Because there is evidence of occupation at the site during the Late Woodland and Early Mississippian Periods, the data base at the site may provide information regarding the nature of the technological and socio-political changes that occurred with the advent of the Mississippian Period.

The historic component at this site is one of the few 19th century occupation sites known in the St. Francis Lowlands. Within the St. Francis Basin, settlement in the lowlands followed settlement in the highlands in the Ozarks and

on Crowleys Ridge. The lowlands soils were well suited for agriculture but the swampy nature of the region acted as a deterrent to early settlers. Analysis of the General Land Office survey plats for townships along the St. Francis River shows that the lowlands settlements were more concentrated in the areas nearest the Ozark Escarpment, suggesting that the first settlers in the lowlands came from the Ozarks and were closely tied with the established settlements on the escarpment. Of the few 19th century occupation sites identified in this survey, site 23SO412 is the closest to the Ozarks. This suggests that it may have been one of the earliest farmsteads established in the area. The identification of the site with the farm of Martin Ascher suggests an association with the German American population which was an important ethnic group in southeastern Missouri.

Project Impacts on Potentially Eligible Resources

Adverse impacts which may occur to the cultural resources within the project right-of-way are related primarily to the channel cleaning activity which is planned for the St. Francis River. There is no planned enlargement of the existing channel nor are there any plans for excavation of new channels between existing river meanders.

In a channel cleanout project of this sort, the vegetation and other materials which have obstructed the normal river flow will be removed and discarded along either side of the river within the right-of-way. Heavy machinery such as a bulldozer will be used to uproot the vegetation and to dispose of it along the river bank. The waste vegetation may then be burned. The primary project impacts to cultural resource sites within the right-of-way are therefore related to: (1) the movement of construction machinery, (2) the uprooting of vegetation, and (3) the disposal of waste material. In addition to these primary impacts, secondary impacts to cultural properties may be caused by the clearing of wooded areas and the use of the land for agriculture. These impacts will probably occur to the sites regardless of whether the channel cleanout project is completed. However, since the channel cleanout project will improve the local drainage and the agricultural potential of the area, the project may accelerate the rate at which secondary impacts will occur.

It is generally recognized that any uncontrolled mechanical disturbance of an archaeological deposit such as may result from plowing or land leveling causes a loss in the scientific value of that archaeological deposit. Uncontrolled alteration of archaeological context and provenience renders the data base less amenable to scientific study. Also, the burning of undesirable vegetation on top of a site could adversely impact its data base in several ways. First, the heat generated from such burning could alter the physical characteristics of the lithic artifacts and thereby confuse the identification of heat treated stone. The heat generated by vegetative burning might also cause stone artifacts to fracture and thereby produce an additional quantity of fire cracked rock. If sherds with micaceous sand in their temper are present, then the effects of the

burning will cancel the potential to perform alpha recoil dating. This results because high temperatures anneal the pits that are produced by the disintegration of the uranium and thorium atoms within the mica particles.

Secondary project impacts related to timber clearing and continued agricultural use of the project area are unavoidable since the project involves privately owned land. The government will acquire legal right of entry only for the project area and will have no legal basis to prevent timber clearing or agriculture within the project area.

Mitigation of Adverse Effects

Overview

In the developing science of cultural resource management, three general strategies of impact mitigation have been developed for compliance with federal laws: (1) avoidance of adverse impacts through modification of project design, (2) *in situ* resource preservation, and (3) data recovery or salvage. Of these, the first alternative is the generally favored course of action for two reasons. First, modification of the project design may often completely remove a resource from project related impacts. Second, project design modification is often more practical and less costly than *in situ* resource preservation or data recovery.

The second mitigation strategy, *in situ* preservation, is preferred when two conditions exist: first, when the required project design modifications are of such a magnitude that from a project planner's point of view the modifications are impractical; and second, when viable engineering solutions are available to effectively protect and preserve a particular resource from the impending project impacts.

The third mitigation strategy, data recovery, is generally the least favored alternative because: (1) it is seldom possible to effect a fully adequate and complete data recovery program, (2) it often requires very large expenditures of money, and (3) it may delay completion of a project for months or years. For the present project, mitigation by avoidance is given primary consideration because it is the most effective means of resource preservation and because preservation of significant cultural resources is stipulated as the preferred mitigation solution in the contract under which this study is performed (Contract DACW66-78-C-0054, page A-4).

Project Design Modification

The primary adverse impacts of the project on the potentially eligible resources could be mitigated most effectively by avoidance of the sites during construction. Sites which are determined to be eligible for the National Register should be excluded from the project right-of-way in order to prevent

impacts related to movement of construction vehicles and disposal of spoil material. Avoidance of impacts to significant sites could be accomplished most effectively by the following actions:

(1) Identification of the site areas on the construction drawings given to the contractor responsible for the channel improvement as "environmentally sensitive areas".

(2) In the field delimitation of the sites, with sufficient buffer zones.

(3) Inspection by Corps of Engineers personnel to insure that the delimited site areas are actually avoided during construction.

Only the second element of the preceding mitigation plan might require the services of a private contractor. A cost estimate for this service including wages, per diem expenses, vehicle use, miscellaneous supplies, supervision, institutional overhead, and profit is $950, and the time required is three days assuming a crew of two archaeologists.

In Situ Preservation

In situ resource preservation may be necessary in the event that some or all of the sites are determined eligible for the National Register and primary adverse effects are unavoidable. In situ preservation is a relatively new form of impact mitigation for cultural resources; however, the high dollar costs and project delays commonly associated with archaeological data recovery, the practical impossibility of excavating all significant sites, and the desire to preserve sites for future study have recently led to serious consideration of this strategy. In situ preservation has rarely, if ever, been accepted as the sole form of impact mitigation, and it is usually coupled with a partial data recovery program.

Recently, mitigation plans consisting of partial data recovery and in situ preservation for the Rivervale site (3PO395) and the Mangrum site (3CG636) were approved by the Advisory Council on Historic Preservation. Both sites were threatened with impacts related to drainage ditch construction. The measures proposed for site preservation consisted of covering the sites with an inert material (six to nine inches of sand) prior to dumping of excavated spoil, armoring the portions of the sites exposed in the actual ditch channel to prevent further erosion, and establishing permanent datum monuments at the sites (Klinger 1978:113-120).

The recommended in situ preservation measures for potentially eligible sites that may be impacted by the Wappapello to Crowleys Ridge Project consist of spreading a protective covering over the site areas prior to the entry of construction vehicles and the disposal of waste material. Protective covering of the sites should prevent scarification of the site surfaces by construction machinery and provide a boundary between the cultural strata and the overburden

of waste material. A layer of coarse sand 25 centimeters (9.8 inches) thick overlain with a 10 centimeter (3.9 inch) layer of gravel is suggested for the protective covering. The blanketing should be spread from the periphery of the sites toward their centers in order to minimize impacts to the sites.

The estimated costs for covering the three identified potentially eligible sites are $3,900 for 23BU210, $16,900 for 23S0401, and $9,800 for 23S0412. These cost estimates are figured from estimated unit costs of $7.88 per cubic meter for sand and $6.35 per cubic meter for gravel and include materials, transport costs, and professional supervision of the work.

Although the recommended protective covering may effectively prevent primary impacts to the sites during project construction, this type of preservation will probably be short-lived. Because the sites are on private land, adverse effects related to agricultural use will probably continue indefinitely.

Data Recovery

If adverse effects to sites which are determined eligible for the National Register cannot be adequately mitigated either by project design modification or by *in situ* preservative measures, then a program of archaeological data recovery should be initiated.

A multi-stage research strategy should be developed according to archaeological research goals appropriate to each eligible site. The general framework of this type of data recovery program involves several discrete phases of data recovery and analysis to be accomplished in the following order: (1) surface analysis to delineate intra-site sampling strata, (2) low intensity sample excavation involving a combination of hand and machine excavation, and (3) block excavation of contiguous areas of the site. These steps must be accomplished sequentially because the information gained from one stage will shape the strategy for the following stage.

Surface study of the sites should be accomplished by establishing a grid system of relatively small units and by recording the artifact content within each unit at a level sufficient to define sampling strata for the subsequent subsurface investigations. Appropriate criteria for definition of sampling strata may be the relative occurrence rates of major artifact classes such as fire cracked rock, ceramics, debitage, and bifaces. Also, the distribution of organic remains or observed midden stains across the site should be an important consideration for determining the distribution of subsurface sample units.

The initial phase of subsurface data recovery should be oriented towards: (1) assessment of the general stratigraphic characteristics of the sites, (2) testing of areas where surface evidence suggests the likelihood of finding subsurface features such as midden deposits, house patterns, burial areas, storage pits, and refuse pits, (3) recovery of botanical remains which may provide information on prehistoric subsistence patterns, (4) recovery of radio-

carbon and other datable samples so the period of occupation may be precisely determined, (5) assessment of the prehistoric technology as represented in the ceramic and lithic artifacts and architectural remains, and (6) development of a classification system for the exotic cherts present at the sites. This phase of data recovery would require a relatively low sampling fraction and should include hand excavation, backhoe trenching, and limited stripping of the plowzone with a road grader or bulldozer.

The final data recovery phase, block excavation, involves the exposure of larger portions of the sites in order to record features such as house patterns and specific activity areas. The scope of a block excavation program depends on the results of the initial subsurface testing. If a large number of subsurface features such as burials, storage pits, and post mold patterns are discovered at a site, then a substantial portion of the site should be excavated. Conversely, if few or no subsurface features are discovered during the initial subsurface testing, then the need for block excavation would be diminished. Finally, the scope of block excavation required at a particular site should be influenced by the severity of adverse impacts expected at the site and by the availability of effective preservation techniques.

A point which may influence the viability of mitigation by data recovery is the final disposition of artifactual materials which would be recovered from the sites. Although the Corps of Engineers will obtain right-of-way privileges for all land within the project boundary, legal ownership of the land will remain in private hands. In Missouri, unauthorized removal of artifacts from private land may constitute criminal trespass; therefore, permission for the removal of artifacts would have to be obtained before the recommended data recovery program could be legally effected.

The estimated costs and field time required for data recovery programs at the three identified potentially eligible sites are given in Table 27, including professional salaries, per diem expenses, vehicle use, laboratory analysis and testing, publication costs, institutional overhead, and profit. Because the necessity for block excavation is uncertain, no estimates for this phase of data recovery are given.

Summary Recommendations

The government should attempt to obtain permission to conduct a cultural resource survey within the unsurveyed portions of the project area (see Table 26) and should seek permission to conduct the necessary archaeological investigations at sites 23BU208 and 23BU215 to evaluate their eligibility for the National Register.

The Corps of Engineers should consult with the Missouri State Historic Preservation Officer (SHPO) regarding the significance of the three sites which

TABLE 27

ESTIMATED COSTS AND TIME REQUIRED FOR

ARCHAEOLOGICAL DATA RECOVERY AT POTENTIALLY ELIGIBLE SITES

TASK	ESTIMATED DOLLAR COST	TIME REQUIRED
23BU210		
Surface Analysis, Low Intensity (1%) Sample Excavation	11,000	2 weeks
23SO401		
Surface Analysis, Low Intensity (1%) Sample Excavation	65,000	12 weeks
23SO412		
Surface Analysis, Low Intensity (1%) Sample Excavation	16,500	3 weeks

are now considered potentially eligible for the National Register (23BU210, 23S0401, and 23S0412) and all additional sites which appear to be significant following the additional recommended survey and evaluation. Following consultation with the Missouri SHPO, the Corps of Engineers should seek a formal determination of eligibility from the Secretary of the Interior for all properties which appear to meet the National Register criteria.

In the event that any properties are formally determined to be eligible for the National Register, the Corps of Engineers should apply the Criteria of Effect and the Criteria of Adverse Effect as outlined in "Procedures for the Protection of Historical and Cultural Properties" (Code of Federal Regulations, Title 36, Chapter VIII, Part 800). If it is determined that the project will have an unavoidable adverse effect on significant cultural properties, the Corps of Engineers should initiate a program to mitigate the adverse effects as outlined above.

Finally, it is likely that some very small surface sites were undetected during this survey, and there is also some likelihood that buried sites exist within the project area. Should additional sites appear during construction, the Corps of Engineers should ascertain if they meet the criteria of eligibility for inclusion in the National Register. If cultural properties identified during construction are determined to be eligible for the National Register, the Corps of Engineers should, in consultation with the Missouri State Historic Preservation Officer, determine what effect the project will have on the properties and initiate appropriate mitigation measures, if necessary.

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MAPS

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INTERVIEWS

15 May 1978

Mr. Charles Redman, a drainage engineer for various Dunklin County, Missouri drainage districts, was interviewed by Dr. Michael Dougan of Iroquois Research Institute.

17 May 1978

Mr. E.B. Bowie, a farmer and resident of Green Oak, Missouri, was interviewed by Dr. Michael Dougan of Iroquois Research Institute.

17 May 1978

Mr. Clarence Powell, a lawyer and resident of Dexter, Missouri, was interviewed by Dr. Michael Dougan of Iroquois Research Institute.

17 May 1978

Mr. David S. Shain, a banker and resident of Fisk, Missouri, was interviewed by Dr. Michael Dougan of Iroquois Research Institute.

17 May 1978

Mr. Robert L. Mann, a former teacher and present insurance agent and resident of Poplar Bluff, Missouri, was interviewed by Dr. Michael Dougan of Iroquois Research Institute.

ABOUT THE AUTHORS AND CONTRIBUTORS

Iroquois Research Institute is one of the most active private research centers for archaeological and historical investigations in North America. The firm is headquartered in Fairfax, Virginia, outside Washington, D.C., and maintains branch offices in St. Petersburg, Florida and Memphis, Tennessee. The Institute has attracted a highly skilled staff organized in the research services of Anthropology, History, Architecture, and Environment and Engineering. In addition to the full time staff, visiting scholars are invited to participate in specialized and complex research projects.

Charles H. LeeDecker, Principal Investigator, received his M.A. in Anthropology from the George Washington University in 1978. He has supervised numerous cultural resources field assignments throughout the United States and served as principal author or co-author of a dozen Iroquois Research Institute publications. He is a member of the Society of Professional Archaeologists with certification in field research and cultural resource management.

Keith Bott received his B.A. in Anthropology and English from Drew University in 1976 and has done graduate work in Archaeology at The George Washington University. Mr. Bott has experience as a photographer for a biome and geophysical survey in the Mojave Desert and Sierra Nevada, as an assistant archaeologist, and as a foreman in the restoration of an early nineteenth-century grist mill. Since coming to Iroquois, he has participated as a member of historical and prehistoric archaeology crews responsible for reconnaissance surveys, intensive surveys, excavation, and mitigation of archaeological sites. He has edited or co-authored numerous Iroquois reports.

Cecil R. Brooks, Senior Environmental Scientist, received his Ph.D. in Plant and Soil Sciences from Texas A & M University in 1966. He has 19 years of research experience including five years of environmental impact analysis for diverse engineering projects, natural resources development, and recreational facilities. He has been a contributing author and researcher for various Iroquois studies including the research design for a predictive model of cultural resources in the St. Francis Basin in Missouri and Arkansas, and has published numerous professional papers. His present interests include paleoecology in relation to prehistoric land uses.

Sherry G. Brown, Office Manager in Memphis, Tennessee, completed her B.A. in Anthropology at the University of Kentucky in 1976. She has participated in archaeological projects in Kentucky, Indiana, Mississippi, Alabama, Virginia, Arkansas, and Missouri. She has contributed to several Iroquois publications including The Cultural Resources of Gathright Lake, Virginia, and The Cultural Resources of Lowes Island, Virginia, and numerous survey-level publications.

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