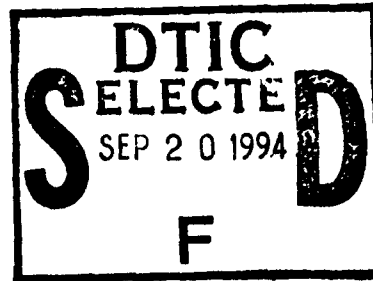


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ARCHEOLOGICAL RECONNAISSANCE
KANSAS AND SMOKY HILL RIVERS BANK STABILIZATION STUDY, KANSAS

in fulfillment of
U. S. Army Corps of Engineers,
Kansas City District, Purchase Order Number
DACW41-80-M-0089

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Prepared by
Environmental Resarch Center
Jefferson City, Missouri
June 1980

Principal Investigator
Craig Sturdevant

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; Distribution unlimited	
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE				
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION ENVIRONMENTAL RESEARCH CENTER		6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State, and ZIP Code) JEFFERSON CITY, MISSOURI			7b. ADDRESS (City, State, and ZIP Code)	
8a. NAME OF FUNDING / SPONSORING ORGANIZATION KC DISTRICT CORPS OF ENGINEERS		8b. OFFICE SYMBOL (if applicable) PD-R	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DACW41-80-M-0089	
8c. ADDRESS (City, State, and ZIP Code) 700 FEDERAL BUILDING, 601 E. 12th STREET KANSAS CITY, MISSOURI 64106-2896			10. SOURCE OF FUNDING NUMBERS	
			PROGRAM ELEMENT NO.	PROJECT NO.
			TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) ARCHEOLOGICAL RECONNAISSANCE KANSAS AND SMOKY HILL RIVERS BANK STABILIZATION STUDY, KANSAS				
12. PERSONAL AUTHOR(S) Craig Sturdevant				
13a. TYPE OF REPORT FINAL		13b. TIME COVERED FROM 1980 TO 1980		14. DATE OF REPORT (Year, Month, Day) JUNE 1980
				15. PAGE COUNT 78
16. SUPPLEMENTARY NOTATION				
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	archeological reconnaissance floodplain	
			Kansas River Smoky Hill River	
19. ABSTRACT (Continue on reverse if necessary and identify by block number)				
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20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL			22b. TELEPHONE (Include Area Code) 816-426-3420	22c. OFFICE SYMBOL PD-R

19. (continued)

in order to adequately define their level of significance in terms of National Register of Historic Places eligibility criteria. It is recommended that 14GE335 not be considered eligible for nomination to the National Register of Historic Places.

On the basis of the investigative research design and resultant information, it is recommended that further intensive survey of the floodplain zones not be initiated. The data gathered suggest that the most effective means of protecting/recovering archeological manifestations within the high erosion zones would be through a program of monitoring during excavation procedures in high site potential areas--settings near confluences of streams and major rivers--and periodic monitoring in less sensitive floodplain terrain.

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INTRODUCTION

In compliance with current environmental regulations and policies, the U.S. Army Corps of Engineers, Kansas City District, contracted with the Environmental Research Center, Jefferson City, Missouri, to conduct a study within certain designated areas of the Kansas and Smoky Hill River valleys in order to inventory and assess the archaeological resources located within these areas. This information is essential for evaluating the potential impact on the culturally significant resources present which may occur from any proposed river stabilization projects scheduled in these areas and in developing an appropriate program of mitigative and/or alternative action to circumvent the destruction of valuable cultural resources. Included within the following report, which is submitted in fulfillment of the terms specified in Purchase Order DACW 41-80-M-0089, will be the results of this study.

Under existing legislation and policies as outlined by the Antiquities Act of 1906, the Historic Sites Act of 1935, the Reservoir Salvage Act of 1960, the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, Executive Order 11593, the Archaeological Conservation Act of 1974, and other applicable regulations, it is necessary to inventory and assess the significance of cultural resources located within a proposed project area, or within areas subject to any associated project activities and to evaluate any extirpating effect on these cultural resources which the proposed project may have. The present preliminary investigation was conducted in order to provide this evaluation for the Kansas and Smoky Hill Rivers Stabilization Study and to circumvent the possible destruction of culturally significant resources.

The Study

The Kansas and Smoky Hilly Rivers Bank Stabilization Study is investigating the possibilities of: (1) Reducing economic losses resulting from bank erosion along the Kansas and Smoky Hill Rivers, (2) Providing increased recreational opportunities along the Kansas and Smoky Hill Rivers, particularly along the Kansas River below Lawrence, and (3) Enhancing environmental attributes of the Kansas and Smoky Hill Rivers as related to solutions to the bank erosion problem (Corps of Engineers Draft 1980:B-9). Alternative management measures which may have an effect on potential cultural resources include construction of hardpoints, toe protection, window revetments, stone fill dikes, stone fill revetments, and vegetative stabilization (Corps of Engineers Draft 1980:B-10, B-15).

Scope and Goals of the Present Study

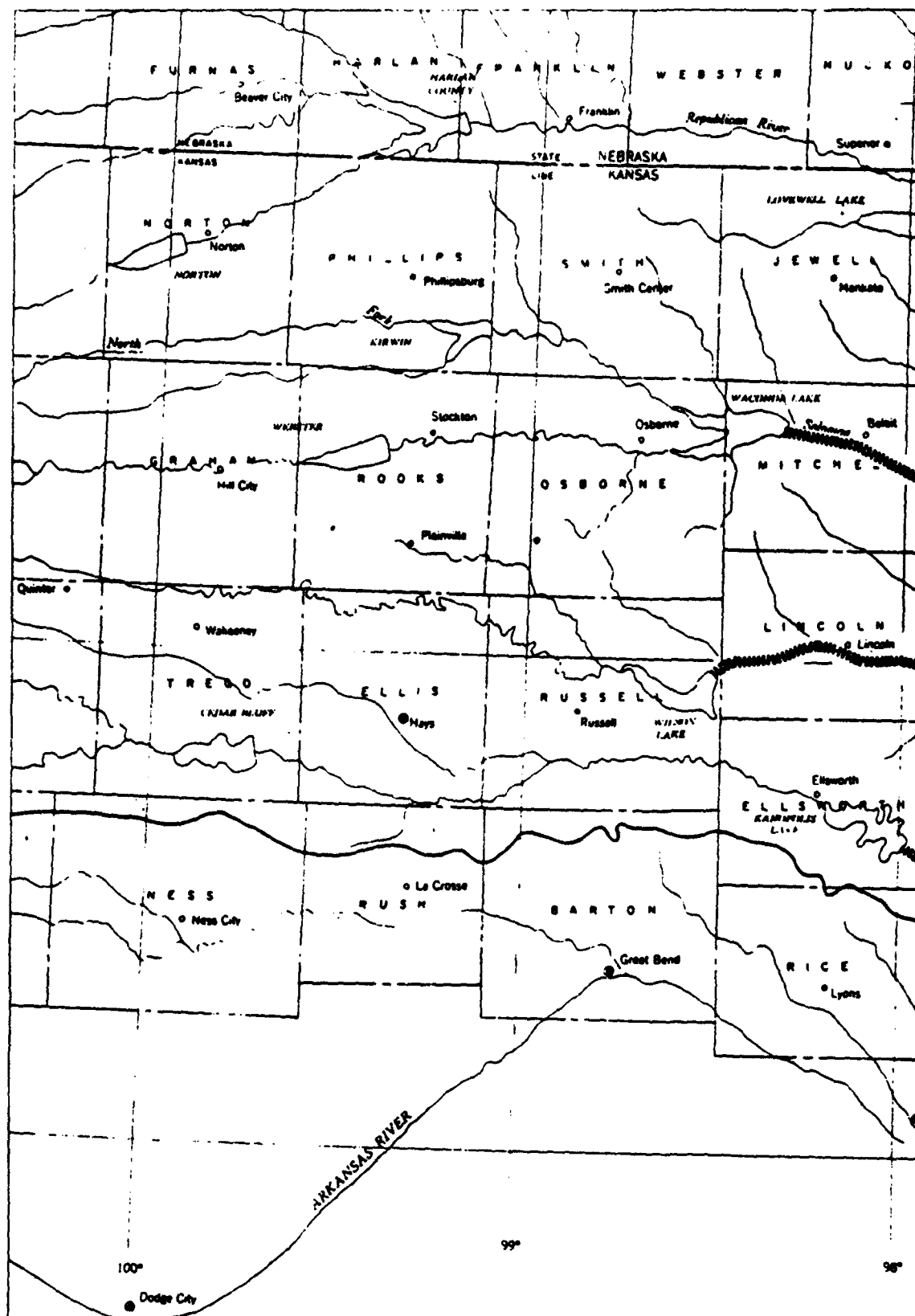
The present study is an archeological reconnaissance of eight zones of severe erosion and migration on the Kansas and Smoky Hill Rivers, Kansas. The eight zones are noncontiguous parcels, total approximately 32 miles in length, encompass approximately 3,900 acres, and are limited to an area 1,000 feet from the river banks. The actual 15% study required in the Scope of Work involves approximately 582 acres. The field reconnaissance for the study consists of an on-the-ground surface examination of the reconnaissance area carried out to obtain preliminary, predictive data on the distribution and nature of archeological sites as well as to provide a general impression of the value of the sites, and the probable impact of future plans on the sites (See Figure 1).

The goals of the present study, as specified in the agreement with the Corps of Engineers, were accomplished by initiating a review of available records and the results of earlier investigations. This procedure was followed by an in-field physical inspection of selected accessible areas within the designated study area.

Designation of provenience within the general study area of the previously known archeological sites as well as those recorded during the present investigation is discussed within the text and shown on maps enclosed under separate cover. Evaluation of potential impact a proposed project may have on the known cultural resources and recommendations for appropriate mitigating action is discussed under each site description and also in the final section of the report. Vegetational or other prohibitive surface cover which may have prevented culturally significant materials from being observed during the present investigation was noted and is incorporated in the general findings.

Cognizant of the need for maintaining constant interaction between professional archeologists and in asserting the primary goal of upholding a high standard of professional ethics, it is the policy of Environmental Research Center to submit all artifactual materials recovered when this occurs, to a recognized institution capable of proper curatorship and to provide the appropriate state agencies with site reports for all archeological and historical sites recorded during any survey. Site reports from the manifestations recovered by this study have been submitted to the Kansas State Historical Society in Topeka, Kansas. The artifacts were left in the field.

Organizationally, the report presents environmental and cultural background information relevant to the study area, research design developed and carried out during the study, the study findings, and a summary of recommendations resulting from the investigation. Exact cultural resource locational information is submitted under separate cover.



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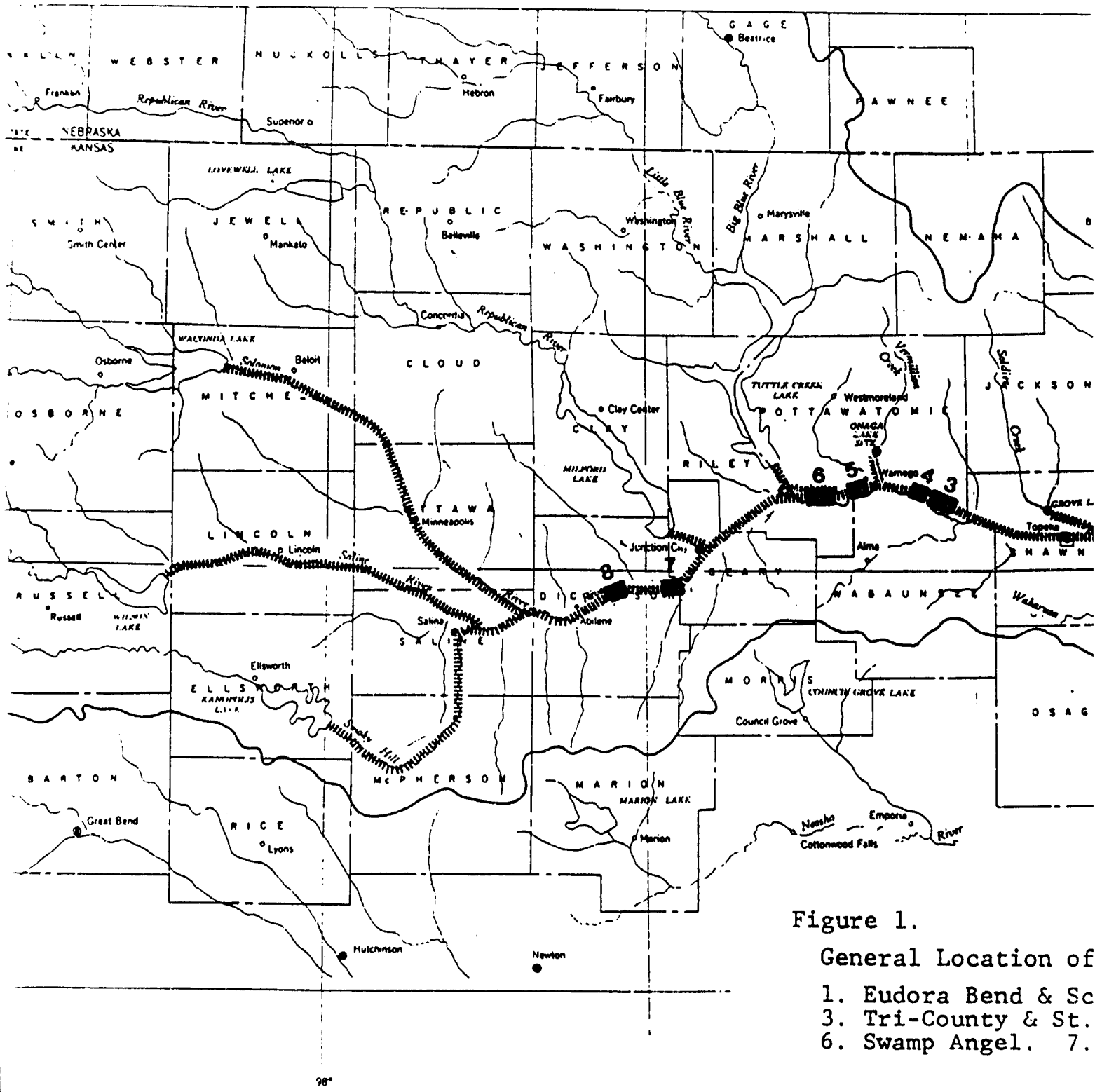


Figure 1.
 General Location of
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 3. Tri-County & St.
 6. Swamp Angel. 7.

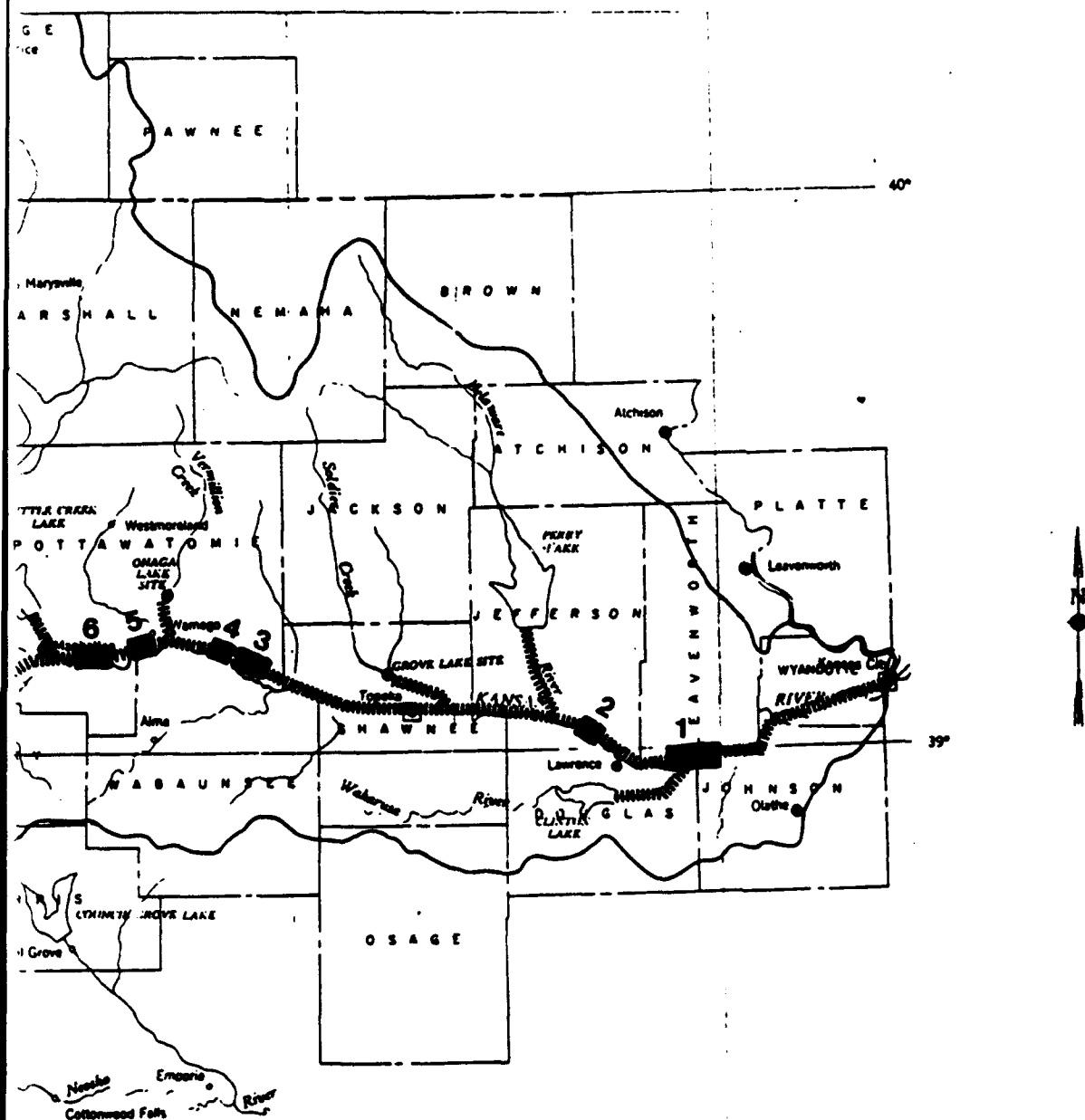


Figure 1.

General Location of the 8 Study Areas

1. Eudora Bend & Schaaake Bend. 2. Lawrence/Lakeview.
3. Tri-County & St. Mary's. 4. Belvue. 7. Wabaunsee.
6. Swamp Angel. 7. Smoky Hill # 1. 8. Smoky Hill #2.

3

ENVIRONMENTAL SETTING

Physiographic Features

The majority of the project area lies within the Central Lowlands Province with the relatively small portion at the western end falling within the Great Plains Province (Fenneman and Johnson 1946). The eastern half of the study zone is bordered on the north by the Dissected Till Plains section. To the south of the river valley lies the Osage Plains section which is composed of the Osage Cuestas and Flint Hills Upland areas (See Figure 1).

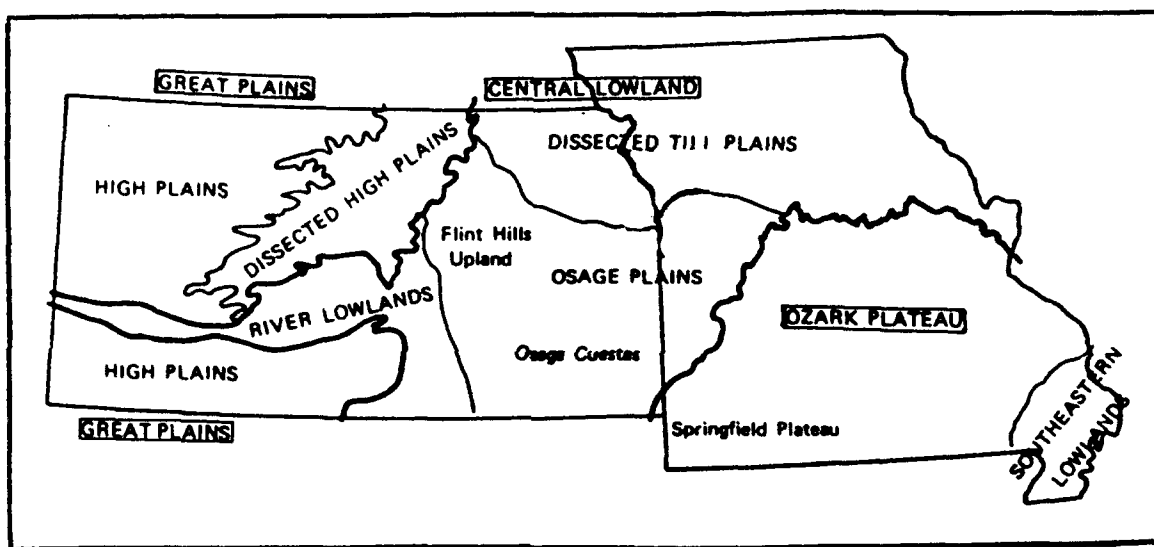


Figure 1.

Physiographic Map of Kansas and Missouri
Source: Corps of Engineers 1975

"The Osage Cuestas extend from central Wabaunsee County eastward across the extreme southern portion of the study area in Johnson County. Surface features in the area are distinguished by irregular east-facing escarpments formed by the erosion of alternating layers of hard limestone and soft shale. The escarpments range from less than fifty to more than 200 feet in height" (Burns and McDonnell 1980:I-1).

"The Flint Hills are a forty mile wide range of north-south flowing, east-facing, rugged bluffs stretching from the Nebraska to the Oklahoma borders.

They are several feet high with prominent east-facing escarpments and terraced, rocky slopes (Burns and McDonnell 1980:I-1).

The Smoky Hills Upland lies within the Dissected High Plains subprovince of the Great Plains Province and is characterized by sharply dissected plateaus.

Movement of the Nebraskan and Kansan glaciers across portions of the region during the Early Pleistocene resulted in the deposition of glacial drift material over the underlying Pennsylvanian age bedrock. Comprised of unconsolidated clays, sands, gravels, pebbles, and boulders, this drift material is irregular in both depth and distribution throughout the region. The Kansan drift, the later of the two noted, forms the land surface over the northeastern portion of Kansas. It has been exposed to the elements to the point that it has lost much of its original postglacial character. Moraines have disappeared and the old drift surface has been carved with deep stream valleys (Thomson 1977:31). The glacial drift in the northeastern portion of Kansas is covered by eolian deposits two to twelve feet thick (Burns and McDonnell 1980:I-1). The Osage Plains and High Plains border area, effected more by post-glacial activity rather than the ice sheets themselves, are mantled by eolium, alluvium, and colluvium.

The majority of the present study area is covered with alluvium of varying depths consisting of clays, clayey silts, clayey sands, and silt (Corps of Engineers Draft 1980). Tertiary surficial bedrock exposed beyond the western extreme of the present study zone is composed of "algal limestone" (Burns and McDonnell 1980:I-1) while the majority of the river valley geology is Pennsylvanian age limestone and shale strata (Schoewe 1949).

The Kansas River, which represents the dominant feature within the study area, flows in a generally west to east direction into the Missouri River and is considered the primary drainage system for northern Kansas, southern Nebraska and northeastern portions of Colorado (Corps of Engineers 1973). The bluffslopes exhibit loess and drift with the valley itself covered by over 50 feet of alluvium which overlies Kansan till and Pennsylvanian age rock (Corps of Engineers 1975:18). The main stem of the river begins where the Smoky Hill and Republican Rivers join and flows approximately 170 miles to the east and its confluence with the Missouri River. The Kansas River is defined as a mature river exhibiting a broad meander belt and associated oxbow lakes (Land Inventory & Development 1979:1). The river valley floodplain width varies from around 1.5 to 2.5 kilometers. The Smoky Hill River valley exhibits more erratic meanders than the Kansas River and a narrower floodplain (Corps of Engineers Draft 1980).

The topographic setting of the study area has been generally grouped into three types: 1. Creek and river valleys, 2. high uplands or prairies, and 3. the broken, hilly country which extends from the borders of the uplands downward to the valley floors or terraces (Burns and McDonnell 1980:I-2). The floodplains of the Kansas River and its tributaries generally show little relief from valley wall to valley wall, only broken by dissected terraces, oxbows, and some sand dunes. Elevation ranges from 1200' m.s.l. along the bluffs in the western portion of the study area to less than 740' m.s.l. at the confluence of the Kansas and Missouri Rivers. From cursory estimation from appropriate topographic maps, range between valley floor and blufftop varies around 100 to 150 feet.

Soils in the study area and its tributaries are alluvial clays, silts, sand, and gravel. The soil type is dependent upon the parent soils which vary throughout the study zones in type as well as in the amount of deposition (Corps of Engineers Draft 1980:Appendix 9). Dominant soil types in the eastern portion of the study area are composed of the Onawa-Haynie-Eudora soil series with general parent material of recent alluvium. Within the adjacent uplands, the general parent material for the primary soil association, the Knox-Ladoga soil series, is loess (Corps of Engineers 1975). The floodplains and low terraces of the eastern Kansas River tributaries (Wakarusa and Delaware, Soldier Creek) are made up of Kennebec-Wabash-Reading soil series while the Smoky Hill River is characterized by calcareous silt and clayey loams of the Humbarger-Muir associations (Burns and McDonnell 1980:I-3). Immediately adjacent to the river soils are sandy riverwash while the first and second bottoms of the floodplain exhibit deep silt and sandy loams.

Climate

The climatic conditions within the study area are classified as continental, characterized by cold winters and warm to hot summers with often rapid changes in weather conditions, particularly during the spring months (Corps of Engineers 1975). Mean annual precipitation ranges from a high of 36 inches at the eastern border of the study area to less than 19 inches in the Smoky Hill region (See Figure 2). The growing season lasts around 185 days (Corps of Engineers 1975:20).

Flora and Fauna

The study area is composed of oak-hickory forests along the eastern half of the Kansas River valley, blending into northern floodplain forests toward the west. Bluestem prairie lies along the northern edge of the valley and on the south along the western half of the study zone. The mosaic of bluestem prairie and oak-hickory forest is situated to the south along the eastern half of the Kansas River valley (Figure 3).

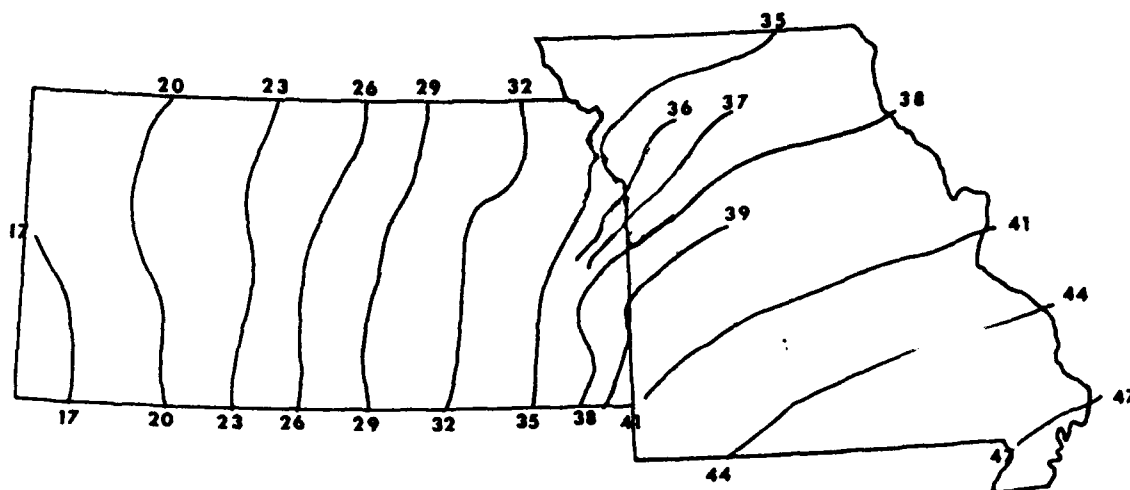


Figure 2

MEAN ANNUAL PRECIPITATION IN KANSAS AND MISSOURI

Source: Corps of Engineers 1975



Figure 3

Flora Associations of Kansas

- Oak-Hickory Forest 
- Mosaic of Bluestem Prairie & Oak-Hickory Forest 
- Bluestem Prairie 
- Mixed Prairie Grasses 
- Northern Flood Plain Forest 

Source: Corps of Engineers 1975

The combination of tall grass prairie and deciduous forest created an ecotone in the eastern half of the area which would have allowed for a wider diversity of floral and faunal species than within either biome individually for utilization in prehistoric populations' subsistence patterns. It is further evident, on the basis of listings of floral and faunal populations, that potential subsistence species probably became less diverse as the oak-hickory fringe developed into prairie zones (cf. Thomson 1977; Shelford 1963).

Witty (1979), referencing Wedel (1959:3-18), points out that:

"...the region is one of eastern Woodland and fringe areas, moving westward into prairie. The animal population reflected this transition with native fauna once consisting of elk, white-tailed and mule deer, black bear, cougar, wildcat, timberwolf, gray and red fox, raccoon, possum, gray fox, beaver, otter, muskrat, and cottontail rabbit. Eastward onto the prairies might have been found bison, coyote, antelope, jack rabbit, badger, etc. Birds which were probably present consist of wild turkey, prairie chicken, quail, passenger pigeon, and Carolina parakeets. Migratory fowl such as ducks and geese were also represented. The streams and major rivers of the area in the past assumed to be clear and unsilted would have yielded edible fish and shellfish' (Witty 1979:3).

A brief summary of remains recovered from archeological sites outside although in the same general region as the present study zone, suggests that a wide variety of faunal species were incorporated into prehistoric subsistence patterns. Table 1 lists identified (common name) species from sites located toward the western and eastern extremes of the study area and from sites to the north and south of the Kansas River valley.

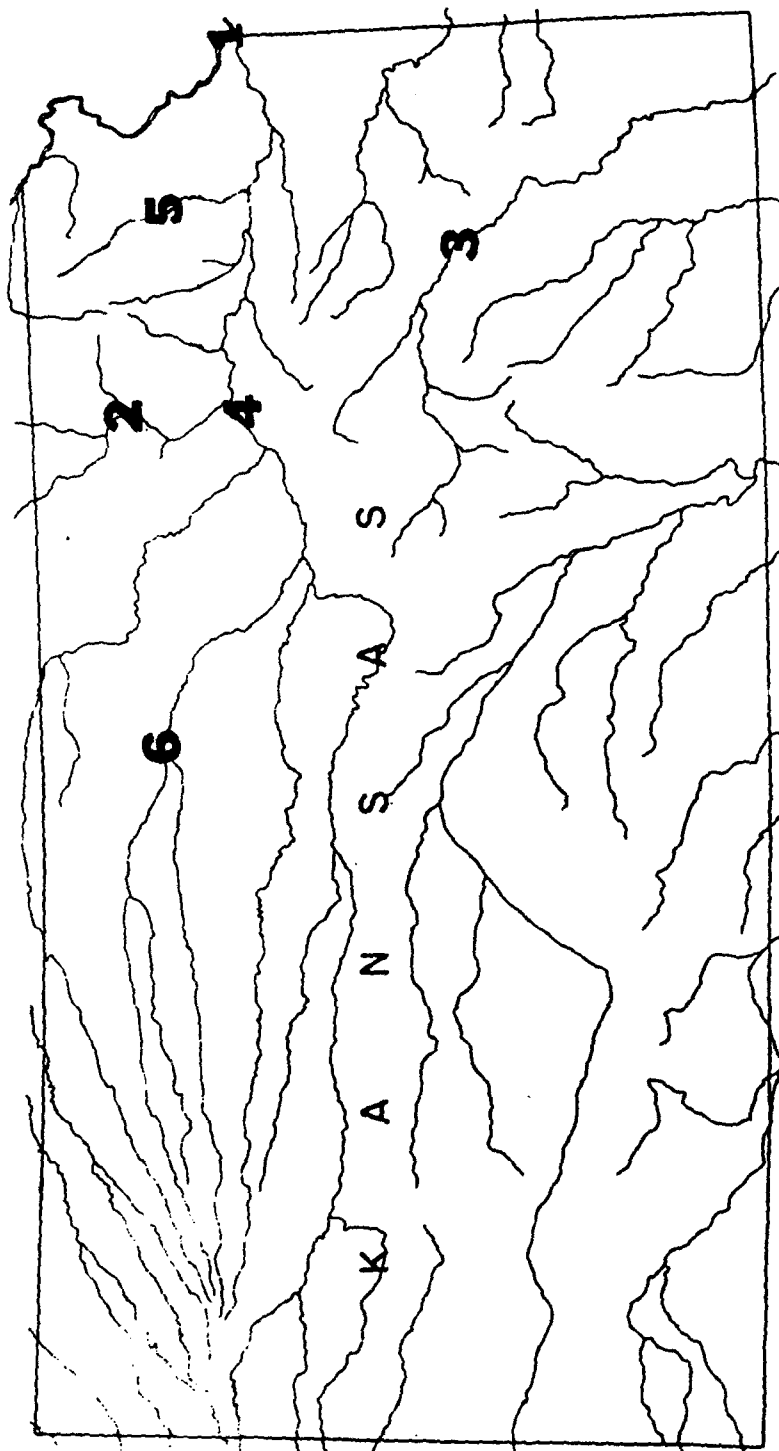
In the oak-hickory forests covering the eastern portion of the floodplain, the bluffslope-upland forest zone would have supported a near climax community consisting of various species of oaks, hickories, elms, and ashes, as well as basswood, hackberry, black walnut, and redbud. The understory of this community would include a wide variety of shade tolerant herbaceous and woody plants. The floodplain forest zone would have ranged from pioneer to near climax in development. Frequently flooded areas would be dominated by water tolerant species of willow and cottonwood while more stable areas of the floodplain would be comprised of such species as sycamore, mulberry, hackberry, and various elms and maples. Most of the species present in the overstory would be represented in the understory which would also contain a wide range of aquatic and terrestrial herbaceous plants (Corps of Engineers 1975).

Table 1

Potential Fauna Associations Within and Surrounding the General Area

Fauna (Common Name)	1	2	3	4	5	6 *
Beaver	x		x			
Bison	x	x		x?		x
Elk	x			x?		
Deer	x	x		x	x	x
Lynx	x					
Black Bear	x					
Coyote	x	x?				
Dog	x	x?				x
Eastern Mole		x				
Ground Squirrel		x				
Grey Fox	x					
Red Fox	x					
Raccoon	x	x				
Cottontail	x	x		x		
Plains Pocket Gopher	x	x				
Hispid Pocket Mouse	x					
Rice Rat	x					
Fox Squirrel	x	x				
Eastern Wood Rat	x	x				
Hawk		x				
Canada Goose		x				
White Fronted Goose		x				
Mallard		x				
Duck		x				
Wild Turkey	x					
Ruffed Grouse	x					
Soft Shelled Turtle	x	x				
Ornate Box Turtle	x	x				
Common Musk Turtle	x					
Elegant Slider Turtle	x					
Map Turtle	x					
Leopard Frog		x				
Great Plains Toad		x				
Timber Rattlesnake	x					
Bull Snake		x				
Ring-Necked Snake	x					
Muskrat				x		
Freshwater Mussel	x		x			x
Catfish	x	x				
Channel Catfish	x	x				
Flathead Catfish	x	x				
Freshwater Drum		x				
Gar	x	x				
Buffalo	x					
Silver & Creek Chub		x				
Sucker		x				
Minnow		x				

* See following page for locational and reference information



*Locational and Reference Information

1. Kansas City Hopewell faunal recover (Feagins 1976:9-10).
2. Coffey Site (Schmits 1978:134-142).
3. Dead Hickory Tree (Schmits, Reid, & O'Malley 1979:58).
4. Ashland Bottoms Site (O'Brien, Caldwell, Jilka, Toburen, & Yeo 1979:13).
5. Grasshopper Falls Phase (Reynolds 1979:73).
6. Glen Elder Focus (Marshall 1969:60-61).

Prior to Euro-American settlement and subsequent extensive modification of native vegetation, the southern border area would have been characterized by a mosaic pattern of tall grass prairie uplands, interspersed with deciduous forests along the stream valleys and adjacent bluffs. The tall grass prairie upland zone would have been dominated by grasses such as big bluestem, little bluestem, Indian grass, switchgrass, and side-oats (Thomson 1977). In addition, forbs such as goldenrod, wild strawberry, bedstraw, sunflowers, and daisy fleabane were represented (Corps of Engineers 1975:26). The western portion of the study area would have continued to exhibit tall grass prairies on the north. The southern borders would have merged into tall prairie grass, ending the bluestem prairie and oak-hickory forest mosaic pattern.

With few exceptions, little archeological evidence of floral utilization is found in the literature. Schmits (1978:146-147) lists recovery of hackberry, ash, elm, maple or box elder, cottonwood or willow, goosefoot, knotweed-smartweed, bullrush, grape, and Solomon's seal as occurring within the Archaic levels of the Coffey Site. Feagins summarizes the Kansas City Hopewell site faunal remains as including black walnut, hazelnut, beaked hazelnut, pawpaw, hickory, bitternut hickory, maple, willow, elm, pecan, oak, wild grape, wormwood, river bullrush, common ragweed, corn, bean, squash, and amaranth (Feagins 1976:9-10).

Summary

It is evident that the proposed project area could have supported prehistoric/historic populations. While physiographic, climatic, and biotic conditions vary over the 190 mile corridor of river valleys, no extreme factors appear within the zone which would effectively inhibit utilization by earlier cultures. The capability for carrying capacity is, of course, no assurance that other factors, such as culturally determined selectivity, did not enter into occupation patterns in the river valleys. This consideration will be dealt with in the findings of the study.

ARCHEOLOGICAL SETTING

During 1978 an archeological literature and record search was carried out by Witty (1979) and O'Brien (1979)* of portions of the present study area. Witty's review involves the Kansas River valley and bluffs from the confluence of the Republican and Smoky Hill Rivers 170 miles east to the confluence of the Kansas and Missouri Rivers. The portion of the present study area in O'Brien's review includes the lower 20 miles of the Smoky Hill River. The following brief review of the cultural background of the general survey zone region utilizes these works as well as other published and unpublished materials.

The study zone occupies a cultural transitional position between and including woodland adaptation to the east and plains adaptation patterns to the west (cf. Wedel 1961). The cultural sequence developed by Witty (1979) in his literature/record review for this project suggests that the general cultural/chronological patterns noted in Table 2 are appropriate for the Kansas River valley. O'Brien, picking up the literature review at the western boundary of the present study zone, includes the Schultz Focus and Keith Focus (A.D. 1 to 900 and A.D. 400 to 900 respectively) within the Early Ceramic. Further, the Upper Republican is designated as Middle Ceramic within the Central Plains (A.D. 900 to 1500) and the White Rock Aspect (Glen Elder Focus) and Great Bend Aspect are included in the Proto-historic (Late Ceramic--A.D. 1500 to 1700) (O'Brien 1979:3-4).

The prehistoric/historic sequence for the Kansas River valley region, as postulated by Witty (1979), consists of six cultural periods which include Paleo-Indian (10000 to 6000 B.C.), Archaic (6000 B.C. to 1 A.D.), Early Ceramic (1 to 1000 A.D.), Middle Ceramic (1000 to 1500 A.D.), Late Ceramic (1500 to 1800 A.D.), and Historic Period (1700 into the 1850's) (Witty 1979: 7-9). A certain amount of temporal and spatial overlap exists between these traditions and undoubtedly further research will result in more distinct divisions.

Paleo-Indian

Utilization of the Kansas River valley by Paleo-Indian populations is poorly documented, although some Clovis, Folsom, and varieties of Plainview points--diagnostic of this cultural period--have been identified as occurring toward the mouth of the Kansas River in Missouri (Chapman 1975:67). It is generally accepted that the socio-economic structure of this cultural

*Preliminary drafts of Witty (1979) and O'Brien (1979) were reviewed for the present study. Final drafts were submitted in 1980.

level was based upon hunting and gathering subsistence techniques and that the socio-economic unit was probably a small extended family (cf. Jennings 1974). Generally, two types of Paleo-Indian sites have been recognized: Temporary camp sites and kill sites. Lack of evidence of Paleo-Indian occupation is probably more a function of antiquity, physiographic change, and small population than non-utilization of the area since it is quite probable that the Paleo-Indian movement throughout the midwest centered around the major drainages (Chapman 1975). The small populations would have left little evidence of their presence while the length of time and physiographic changes resulting in alluvial buildup, river migration, and general erosion would effectively hide these data from observation as well as destroyed a great deal of it. No specific Paleo-Indian sites have been identified in northeast Kansas (Witty 1979:7). The literature and record review carried out by Witty suggests that the present reconnaissance would be very unlikely to recover Paleo-Indian manifestations within the Kansas River valley. James Bee, Professor Emeritus at Kansas University, informed the investigators that he had recovered what he thought to a Paleo-Indian biface two miles up the Delaware under eight feet of alluvial fill (Personal Communication: James Bee).

Archaic

The Archaic is typically separated into the Early, Middle, and Late periods in the eastern woodland portion of the present study zone (cf. Johnson 1974) and non-differentiated toward the western portion of the survey area (Witty 1979; O'Brien 1979). Climatic fluxuations, particularly a xenothermic warming period which reached its height around 2,000 B.C., resulted in diminishing wet climate associated floral and faunal populations (Cleland 1966:20-25). The drying climate forced greater reliance upon collecting vegetal foods and small animals as opposed to the previous hunting tradition of the Paleo-Indian groups. The increased inventory of tool types reflects this change in that more diverse implements were required for extraction and processing associated with the expanding ecological niche (cf. Schmits 1978:166). Emphasis was probably placed on a method of procurement which could effectively exploit various types of resources which are available in reliable quantities, either on a seasonal basis or continually throughout the year rather than on the less diverse Paleo-Indian subsistence pattern. Using a type of adaptation referred to as "primary forest efficiency" by Caldwell (1958), a more restricted settlement pattern may have resulted, adjusting to what Meggers refers to as "Central-Based Wandering" (1954) in which the particular seasonal resources available would determine the type and location of temporary camps radiating from more permanent occupation sites. This form of socio-economic structure would, in theory, have

Table 2

Outline of Archeological and Early Historic
Cultures in Northeastern Kansas by Major Geo-
graphic Areas (Reproduced from Witty 1979:5-6)

Archeological Period	Time Estimate	Dissected Till Plains	Osage Cuestas	Flint Hills Uplands	Aboriginal Primary Subsistence Patterns
Historic Amer- ican, European and Emigrant Tribes	1865 A.D.	Historic Forts: (Cavagnolle, Leavenworth, Scott, etc.) Trails: (Santa Fe, Oregon, Military) Domestic (Dugouts, etc.) Industrial: (Lime Kilns, Pottery Kilns, Mills, Brick Kilns, etc.)			
	1800 A.D.	Shawnee, Iowa, Pottawatomie, Del- aware, Kansa	Wea, Miami, Kickapoo, Sauk, Fox, etc.	Kansa Osage	Small Scale Farming Supplemented Hunting
Early Historic & Protohistoric, Late Ceramic	1800 A.D.	Kansa	Osage		Hoe Gardening and/or Bison Hunting Horse Nomads
	1500 A.D.	Oneota			
Middle Ceramic, Plains Farmer, Central Plains Phase (North), Late Woodland	1500 A.D.	Nebraska Aspect	Neosho Focus	Smoky Hill Aspect	Hunting, Gardening & Gathering
	1000 A.D.	Pomona Focus	Pomona Focus	Pomona Focus	
Early Ceramic, Plains Woodland, Middle Woodland	1000 A.D.	Plains Woodland Cultures----- Valley Focus, Greenwood Phase Grasshopper Falls Grasshopper Phase Phase, Kansas City Falls Phase, Hopewell Hopewell Phase, Cuesta Phase			Hunting & Gathering with Introduction of Gardening
	1 A.D.		El Dorado Phase Eagle Creek Complex	Middle & Late Archaic Groups	Hunting & Gathering
Archaic		Nebo Hill	Nebo Hill	Munkers Creek Phase, Coffey Site	(Foraging)
	6000 B.C.				
Paleo-Indian	8000 B.C.			14RY303	Big Game Hunting
	20000 B.C.	Occasional Surface Finds of Clovis, Folsom, Plainview			

supported a larger population base (Witty 1979:7). One identified Archaic complex in the northeast Kansas area is the Munkers Creek Phase. Identified sites occur toward both the eastern and western extremes of the study area while none are reported from Manhattan to west of Topeka (Witty 1979:Map 1). Archaic sites toward the eastern end of the study area generally occur on terrace remnants and blufftops with few recorded on the floodplains (Johnson 1974:116). The artifact inventory exhibits a variety of stemmed and corner and basal notched projectiles as well as ground stone and bone implements (cf. Schmits 1978:110,113-115,122). Since the present study area includes some blufftops, bluffslopes, and terraces, it is expected that Archaic manifestations could be recovered by surface reconnaissance. Lack of floodplain manifestations has been suggested to be a result of cultural selectivity or "scouring" action of the Kansas River (Witty 1976).

Early Ceramic

Toward the eastern end of the study area this period has been defined as the Woodland (Chapman 1975; Wedel 1943). While firm evidence of the earliest manifestations of this period are lacking even in the oak-hickory forest zone near Kansas City (Johnson 1974), the later Kansas City Hopewell Focus is well represented in the Kansas City area (Wedel 1943; Katz 1974; Johnson 1974) and extends to the Smoky Hill River area (O'Brien et al. 1979) on the west. The Kansas City Hopewell apparently represents an influx of cultural traits resulting from migration and/or diffusion from the southern Illinois River valley (Wedel 1943:22). Village sites typically extended over a 40 to 60 acre area and were apparently intensively occupied as suggested by thick coverings of refuse and numerous trash pits recovered (Wedel 1943:6,22). Whether these village sites were occupied permanently or on a seasonal basis has not yet been established (Katz 1974:47; Wedel 1961:88), although temporary hunting camps are known to be associated with them (Johnson 1974). The O'Brien et al. (1979) investigations of the Ashland Bottoms site (14RY603) southwest of Manhattan suggest that the Kansas City Hopewell influences in the form of hunting/processing camps were utilized over 120 miles upstream from the more extensive sites located in the Kansas City area (O'Brien et al. 1979:18). Ceramics associated with this period typically display sand or grit tempering, both decorated and plain body and rim sherds, gray-tan-brown coloration and varied incised line and shallow punctate patterns (Shippee 1967). Points associated with the sites are generally large stemmed or corner notched (Katz 1974; Shippee 1967).

While subsistence emphasis appears to be on hunting and gathering (Katz 1974), the Kansas City Hopewell is of particular importance as it displays the first evidence on the periphery of the Plains of a subsistence pattern based partially on domesticated cultigens (Wedel 1961:89).

Around 500 A.D. the Kansas City Hopewell culture abruptly disappeared. Johnson argues that this termination of occupation was related to the southward movement of central Plains Woodland influences, and that the disappearance was a result of a syncretism of Plains Woodland and Kansas City Hopewell features (1969:10).

While the pattern of settlement distribution has not been definitely established for the study area, Kansas City Hopewell sites are known to occur upon terraces and along adjacent ridge tops. Village sites are typically found at the mouths of valleys at the point where streams enter the Kansas River valley. Camp sites, as possibly indicated by the Ashland Bottoms investigations, further appear to be directly associated with tributary confluence (O'Brien et al. 1979:2). Tentative speculation would also suggest that temporary or seasonally occupied campsites were located within the floodplain in order to take full advantage of the various resources available within the Kansas River valley.

Closely following or perhaps contemporaneous with the Kansas City Hopewell are the Schultz and Keith Foci (O'Brien 1979:3). The Schultz Focus exhibits "...grit-tempered plain-surface pottery with plain or notched rims; corner-notched arrow points, especially the Scallorn variety" (O'Brien 1979:3). The Keith Focus (A.D. 400-900) exhibits calcite-tempered Harlan Cord-roughened pottery with flattened undecorated rims; corner-notched arrow points of the Scallorn variety (O'Brien 1979:3) and has been identified in the western portions of Kansas as a bearer of Plains Woodland culture (Wedel 1961:99). These foci are contemporary with and similar, at least in lithic diagnostics, to the eastern Late Woodland manifestations found toward the eastern end of the study area. While temper may vary, ceramics exhibit cord marking and the "Scallorn" arrow point is an association (Johnson 1974:119).

The increased effectiveness of the bow-and-arrow as a hunting device may have been instrumental in the shift away from the more sedentary settlement patterns associated with the horticultural developments of the Kansas City Hopewell in the woodland periphery.

Witty's literature/record search for the study area indicates that Early Ceramic/Woodland compose the highest percentage of identified cultural sites along the Kansas River valley (1979:44). Studies carried out in more eastern woodland zones suggest that Late Woodland manifestations are likely to occur in all terrain settings with emphasis on major and minor drainage floodplains (Sturdevant 1978). In the Kansas City area Late Woodland sites occur on ridge tops and valley terraces (Johnson 1974:119). Given the high percentage of Early Ceramic/Woodland sites noted by Witty and the utilization of floodplain environments as camp/village sites, it is highly likely that such manifestations may be recovered in the present study zone.

Middle Ceramic

"Middle Ceramic, ca. A.D. 1000-1500. The technology and adaptation continued to improve and exploit the environment particularly with the presence now of domesticated plants. The next cultural period is represented by cultures living in semi-permanent villages and extended communities located along the river and stream valleys. Gardening was now an important food source, but it still supplemented hunting and gathering as major activities. The locations of sites would be on terraces adjacent to the floodplains of the major streams. These same sites represented for the most part, individual or house clusters usually some form of earth covered or clay plastered frame structures. The presence of storage pits with sites of the Middle Ceramic indicate that at least limited surpluses were available to the people. Within the Kansas river valley on the east has been identified the Pomona Focus (Witty 1967) and to the west, the Central Plains Phase with the Smoky Hill and possibly some Nebraska or otherwise eastern influenced earth lodge dwelling peoples (Wedel 1959). For the most part, the identified sites appear to be on adjacent drainages rather than on the floodplain itself. Such recognition could be as much sampling as cultural selection" (Witty 1979:8).

Diagnostics associated with the Middle Ceramic (Central Plains) include

"Smoky Hill sand-tempered cord-roughened pottery with basically plain flaring or S-form rims, shell tempered, plain-surface pottery with low rolled rims and incised alternating hatched triangles on the shoulder; small unnotched or side-notched triangular arrow points" (O'Brien 1979:3).

Further, Upper Republican is indicated by

"...crushed rock or grit-tempered plain-surface pottery with collared rims having incised geometric designs; small unnotched or side-notched triangular arrow points; diamond-shaped beveled knives" (O'Brien 1979:3).

Witty's review states that of the 65 identified components in the zone from Junction City to Kansas City, two exhibit Pomona affiliation, five Smoky Hill, and six general Middle Ceramic (Witty 1979:44).

Late Ceramic

In the west-northwest portion of the general area the Late Ceramic is identified by White Rock Aspect materials (Rusco 1960:72-74) which has been redefined as the Glen Elder Focus (Marshall 1969:90). This western Oneota-like focus exhibits sand-tempered as well as some shell-tempered ceramics (Marshall 1969:62-63) which are simple-stamped with slightly flaring rims and incised alternating triangles with hatched parallel lines (O'Brien 1979:3). Lithic diagnostics include small unnotched or side-notched triangular arrow points (O'Brien 1979:3). Marshall suggests that "in general, the villages and hunting camps were occupied in the 17th century and it seems most feasible that they were all occupied by the same small population that moved from one locale to another" (1969:94). To the southwest of the project zone the Great Bend Aspect (Little River Focus) is indicated by

"...sand-tempered Geneseo Plain, Simple Stamped and Geneseo red filmed pottery; both side-notched and unnotched triangular arrow points; diamond-shaped beveled knives; Spanish and French trade goods in the latest sites" (O'Brien 1979:4).

Witty (1979:8) points out that bison hunting apparently had become even more important than in previous times and that horticulture was becoming more efficient with more reliance being placed on gardening with corn, beans, and squash as staples. Further, settlement patterns changed as the small hamlet and isolated dwelling shifted to large village centers.

While the area may have potential for Late Ceramic sites, Witty suggests that documentation is vague for the Kansas River drainage (1979:9) and that no identified Late Ceramic sites were recovered by the literature/record review (1979:44).

Historic

O'Brien defines the time frame of this period as 1500 to 1825 (1979:4) while Witty suggests A.D. 1700 to the 1850's (1979:9). In the mid- to later 1700's the Kansa moved into the Kansas River valley area (Wedel 1959:51). Wedel states that their oldest identified village site on the Kansas River is that at the mouth of the Blue River, about two miles east of the present Manhattan (1959:51). Quoting from Thwaites (1904-5), Wedel notes that one village was located about twenty leagues up the Kansas while another was about forty leagues up river (Wedel 1959:51). Witty states that the Kansa resided in a number of villages in the Kansas River valley for around 80 years (1979:9) and notes 3 identified Kansa sites in the vicinity of the study zone (1979:44). Wedel (1959) discusses locational data:

"Following their treaty with the United States in 1825, the Kansa began to drift eastward...In 1834 Townsend found them mostly in two villages on both sides of the Kansas River a few miles west of present Topeka, with a third and smaller village of 30 lodges some distance upstream on the north bank, but below the Vermillion River...The principal Kansa towns from 1830 to 1846 were a few miles above present Topeka" (Wedel 1959:52-53).

In 1846 they were forced to accept a reservation in the upper Neosho River valley (Unrau 1971).

Kansa diagnostics include "Oneota-like" shell-tempered ceramics; side-notched arrow points; French, English and American trade goods (O'Brien 1979:4).

Other Historic groupings indicated as present within or near the study area are the Pawnee with diagnostics of

"...fine sand-tempered pottery with a marked collar rim incised with zig-zags, herringbone and hatched alternating triangles; unnotched triangular arrow points, French, English, and American trade goods" (O'Brien 1979:4).

The Wichita are indicated to be the same as Great Bend with the addition of Euro-American trade goods (O'Brien 1979:4). Witty further notes that

"The Pottawatomie are an immigrant tribe whose early reservation is associated with the Kansas river valley. The Prairie Band of the Pottawatomie who was one of those groups moved from the east into the Indian lands by the United States government. In 1846, the bands accepted the terms of the new treaty which ceded their Iowa and Osage river reservations for the 'Pottawatomie National Reservation' on the Kansas river. Pottawatomie from a variety of locations began to arrive in September of 1847 at the Saint Marys settlement (Clifton 1965:281 and 300). The early reservation was on both sides of the Kansas river from Saint Marys to west of Topeka. Later in 1861, the reservation was shrunk to approximately its present location out of the Kansas river valley to the north. One National Register site from this period of the Pottawatomie presence is the site of the Pottawatomie Baptist Manual Labor training school which is in the valley of a small unnamed tributary at the west edge of Topeka east of the Mission creek valley" (Witty 1979:11).

Immediately to the east in the Kansas City area the Shawnee (Davis 1976:12), the Delawares (Munson: No Date), Munsee

(Davis 1976:12), and Wyandots (Davis 1976:14) illustrate further Historic groupings that may have possibly utilized portions of the present study zones (Weichman & Sturdevant 1977:77-87).

Summary

The literature and record reviews carried out by Witty and O'Brien indicate several potential archeological components within and surrounding the Kansas and Smoky Hill River valleys. Table CUI illustrates the numbers of defined cultural components recorded in and along the river valleys.

Table 2

Recorded Components in the Study Area

<u>Cultural Designation</u>	<u>Smoky Hill Area</u>	<u>Kansas River Area</u>
Archaic	2	11
Archaic/Woodland	2	2
Early Ceramic/Woodland	3	23
Kansas City Hopewell	1	8
Schoelz	6	
Hopewell/Woodland		1
Middle Ceramic	2	6
Smoky Hill	5	5
Pomona		2
Upper Republican	1	
Historic		4
Kansa		3

The background review carried out by the present investigation suggests that the study zones are likely to exhibit archeological manifestations. In terms of general sites, O'Brien indicates that the floodplain terrain in the Smoky Hill portion of the project zone is the highest site potential area (O'Brien 1979:32). Witty, however, finds little evidence of utilization of the Kansas River floodplain by prehistoric populations (1979:42). These suggestions are drawn out more explicitly and included in the present study research design section.

A review of U.S.G.S. quadrangles indicating archeological site locations noted by the reviews of Witty and O'Brien note only two prerecorded sites within the required survey zones--14WB Brower 5 and possibly 14D083. Sites adjacent to the survey zones include 14WB Brower 4 and the "Baldwin Site" (Witty 1979). While several of the 126 sites reviewed by

Witty and the 36 in the general area of the present zone reviewed by O'Brien are located within the floodplains of the Kansas and Smoky Hill Rivers, only those noted above are within or close to the designated study areas. The potentially impacted prerecorded sites are reviewed in the findings of this report.

RESEARCH DESIGN/METHODOLOGY

Introduction

This section outlines the research design developed by Environmental Research Center and the methodological approach incorporated in the investigation.

The scope of the present investigation includes an archeological reconnaissance of eight zones of severe erosion and migration on the Kansas and Smoky Hill Rivers, Kansas. The eight zones are noncontiguous parcels, total approximately 32 miles in length, encompass approximately 3,900 acres of land, and are limited to an area 1,000 feet from the river. The actual 15% reconnaissance area involves approximately 582 acres.

Within the Scope of Work (See Appendix A) are several specific requirements which directly effected development and content of the research design. These are summarized below (numerical designations reflect those within the Scope of Work):

2. SCOPE. The field reconnaissance for this study will consist of an on-the-ground surface examination of the reconnaissance area to obtain preliminary, predictive data on the distribution and nature of archeological sites, to provide a general impression of the value of the sites, and the probable impact of future plans on the sites.

3. STUDY APPROACH, b. Reconnaissance., (1) Problem Orientation. Existence and condition of sites tentatively identified or predicted from the literature search will be verified. Areas where sites are lacking will be identified and a model predicting distribution of sites in the study area will be developed.

3. STUDY APPROACH, b. Reconnaissance., (2) Methodology. (a) Conduct a reconnaissance of 15 percent of the study area...site numbers shall be coordinated with the Kansas State Historical Society. (b) Restrict work to surface observation...No subsurface testing will be conducted. (c) Collect a sample of surface cultural materials at each site only when permission has been granted by the landowner. (d) Record provenience of features...(e) Photograph or illustrate diagnostic features and artifacts...(f) Restrict analysis to functional identification and temporal placement of cultural materials encountered. No extensive analysis of data recovered is required by

this study...(i) Determine which known and new sites require further testing of any kind and indicate relative significance for ranking priorities in accomplishing recommended work. (j) Identify and outline a plan of intensive survey for the study area lands. Construct a predictive model for prehistoric cultural resources in the unsurveyed portion of the study area. Indicate which parts of the study area should have priority for future studies, if any, and why.

Briefly, the preceeding requirements then can be generalized to stipulate 1. An archeological Reconnaissance of 15% of 3,900 acres (582 acres), 2. A major goal of delineation of prehistoric cultural manifestations with a predictive model as the outcome, and 3. Development of a research method which includes review of previous work and accepted and appropriate field and lab methods. The following research design incorporates these requirements, as well as remainder of the Scope of Work stipulations, under headings of background, research goals, research procedures/methodology, research sampling procedures, and analysis.

Background

Two preliminary archeological literature/record searches dealing specifically with the reconnaissance zones have been submitted in draft form to the Corps of Engineers, Kansas City District. Patricia O'Brien (1979) reviews known archeological manifestations including the Smoky Hill River and Thomas Witty's (1979) literature search includes the appropriate portions of the Kansas River.

In attempting to develop a research design that would effectively contribute to construction of a workable predictive model, O'Brien's delineation of the relationship between prehistoric sites reported in the literature and terrain is particularly instructive:

Table 3

Location of Sites Within the Western Portion of the Study Area

	River Bank	Floodplain	Floodplain Edge	Bluff Slope	Bluff
All Sites	1	75	9	5½	22½
	1%	66%	8%	5%	20%

(Source--O'Brien 1979:32).

While the eastern portion of the Kansas River basin differs from the western areas included in O'Brien's literature search, it may be generalized that some similarities could exist as a result of the continuous nature of the Kansas River as a source of potential movement by prehistoric peoples. Approximating terrain type from the project maps, the present reconnaissance zone (total project area of 3,900 acres) indicates that 83% of the area is floodplain and floodplain edge, 9% is composed of bluffslope, and 8% includes blufftops. This suggests that a sampling procedure for the reconnaissance might effectively incorporate predetermined random stratified transect coverage since the project area approximates terrain of the western portion of the project zone terrain/site occurrence relationship. Although Witty (1979) does not include a specific site occurrence/terrain breakdown nor sufficient data for determining the possible relationship, he does point out that a "...relatively small number of known sites on the actual floodplain adjacent to the present channel of the Kansas River..." were found in the literature search (Witty 1979:42). Witty further notes that emphasis should be placed on known areas of erosion in order to preserve possible archeological sites. In other words, O'Brien finds a high floodplain site location percentage but her area of review differs in physiographic setting from the Kansas River proper; Witty finds few floodplain sites in the Kansas River floodplain but suggests that areas of high erosion--floodplain settings--should be given high reconnaissance priority; and the study zones exhibit terrain which somewhat approximates the terrain/site breakdown presented by O'Brien.

A second background consideration discussed by both O'Brien and Witty is the suggestion that areas near the mouths of drainages into the Smoky Hill and Kansas Rivers should be be considered high site potential zones.

In terms of numbers of prehistoric sites, O'Brien found evidence of 113 sites (1979:30) and Witty states that 126 sites are recorded in the Kansas River valley (1979:44). Both authors indicate that the numbers are very possibly not representative as a result of several factors which include non-representative sampling, aggradation and degradation, and cultural selection. Further, O'Brien's study only encompasses a small portion of the present reconnaissance zone--20 miles of Smoky Hill River valley--and may not be representative of the Kansas River basin. In any case, the background literature reviews do indicate the presence of archeological sites within the project zone and suggested some potential considerations for incorporation in the present reconnaissance method.

Both authors opt for some form of stratified sample or nonrandom high potential area examination. Given the preliminary nature of the present study and the major goal of development of a predictive model, the present investigators suggest that random transect coverage should be incorporated in the research design in order to at least allow a preliminary statement as to population/terrain relationship.

Research Goals

As previously stated, the major goal of the present investigation is development of a predictive model which will allow interpretation of site potential within the high erosion areas on the basis of one or more independent variables. Of equal importance would be condition, significance, and potential affect of erosion and migration on known cultural resources within the total study area.

The two major studies which present an initial data base from which hypotheses may be developed (O'Brien 1979; Witty 1979) approach their study areas and interpretation of cultural resource potential from somewhat different vantage points. O'Brien looks at areas within the river valleys themselves and points out possible high to low site potential on the basis of terrain and other physiographic features. Witty, on the other hand, suggests that the river valley floodplain would exhibit "relatively few" (1979:42) archeological manifestations. As previously noted, while cultural resource potential may vary between the western and eastern portions of the survey zones, the present investigators believe that the more positive potential distribution correlation approach suggested by O'Brien could make a contribution to the major goal of the study. On the basis of the materials discussed above, the following hypotheses are suggested as possibilities for interpretation of site potential within the survey zones:

- H1: Floodplain settings will exhibit higher percentages of site occurrence than river bank, floodplain edge, bluffslope, and blufftop settings.
- H2: Areas near the confluence of major streams with the Kansas and Smoky Hill Rivers will exhibit higher percentages of site occurrence than other settings within the study area.

Since the Scope of Work entails nonpredictive requirements including revisits to prerecorded archeological sites in the survey zones and previous works suggest that high erosion areas and high site potential areas should be given priority, nonhypotheses oriented research problems based simply on observation of these specific phenomena are included in the research procedures.

Research Procedures/Methodology

The research operations necessitated two separate field considerations: 1. The hypotheses tests include transect coverage of stratified portions of all mentioned terrain in case of H₁ and 2. H₂ was tested by nonrandom means in that major stream confluence areas as well as minor stream confluence zones were observed with no form of random selection. Areas

designated as specific visit--previously recorded sites within the study areas--were observed as they were present and high erosion areas were checked as they occurred within the selected transects.

Field observation in both instances included transect coverage by a three person team walking in 10 meter intervals. No subsurface testing was incorporated in the pedestrian observation procedure as specified by the Scope of Work. Permission to carry out the survey as well as collect and retain artifactual materials was asked of resident land owners/tenants where they could be ascertained. Where collection permission was not granted or owners could not be found, artifactual materials were photographed in the field.

Sites were recorded following Scope of Work requirements and according to Kansas State Historical Society site forms and guidelines. Pertinent environmental information within the observed areas and associated with archeological sites was recorded in field notebooks. All site areas were photographed, located on appropriate U.S.G.S. topographic maps, and field sketched with approximated scale. All information which was gathered by surface reconnaissance alone that pertains to determining level of significance under National Register of Historic Place eligibility guidelines was noted.

Sampling Procedures

In order to arrive at a predictive model of site occurrence/independent variable(s), coverage was based on randomly selected stratified observation units. Witty (1979) and O'Brien (1979) indicate that almost 10% of the study area is blufftop, almost 10% is bluff slope, and somewhat more than 80% exhibits floodplain setting. Allowing approximately 46 acres of the 15% reconnaissance area for previously recorded site observation and observation of stream confluences, approximately 54 acres of blufftop, 54 acres of bluffslope, and 428 acres of floodplain made up the stratified survey zone.

The reconnaissance units were chosen in the following manner: Each Study Area (File No. A-1-885 through File No. A-1-913 as noted in Item No. 1 in the contract DACW41-80-M-0089) was transferred to appropriate U.S.G.S. topographic maps. Each Study area was divided into 28 area-inclusive equal transects from river outward. The division was based on the total survey area noted for each of the 8 project areas separately. Four transects were picked from each of the Study Areas for intensive surface observation. The attempt was made to select transects which approximate the acreage percentages noted above for the stratified sample area. Where all terrain was not represented, such as no bluff area, a higher percentage of the nonrepresented area was chosen in another Study Area. Several factors entered into the actual areas covered once the field observation began: Many areas

were planted in wheat and could not be observed, some farmers denied access to their land, and some areas were so heavily vegetated that surface observation would have been pointless. In these instances, an attempt was made to maintain the stratified sample and other areas were incorporated as observation units. Quite frankly, the preselected observation units were changed quite drastically once the field inspection component of the study began. In any case, a concentrated attempt was made to maintain the stratified sample in terms of terrain and all prerecorded site area and confluence area coverage.

Analysis

Information recovered by the above methods and techniques was analyzed in terms of cultural affiliation and site type where possible, level of significance in terms of National Register eligibility criteria where possible, provenience, immediacy of erosional/migration and project threat(s), and correlational procedures necessary to suggest appropriateness of the hypotheses and develop a preliminary predictive model indicating site occurrence potential/independent variable. The hypotheses are geared primarily for development of a predictive model of site potential/terrain within the floodplain, partially as a result of O'Brien's site/terrain findings and primarily because the erosion/migration threat will affect floodplain cultural resources to a much greater degree than bluff locations. The stratified sample procedure allowed recovery of data in the highest probability zones (according to O'Brien) while further contributing data for simple correlational procedures which are interpreted in terms of a predictive site potential/terrain model in the findings of this report.

Conditions Affecting Field Reconnaissance

The field reconnaissance was carried out under relatively good observation conditions. Most of the floodplain erosion zones were under cultivation and visibility was relatively good. The terrace/bluffslope/blufftop areas of the zones, however, exhibited grass, forb, and tree cover in most instances and did not allow for adequate surface observation.

Several problems hampered the utilization of the preselected reconnaissance sample. The major problem was a result of extensive utilization of the areas for winter/spring wheat which precluded land entry. The next problem was a result of absentee land ownership: The tenants, in many instances, were suspicious of the request to survey areas they were renting and were often recalcitrant when asked if survey teams could retain materials recovered. The landowners themselves, when contacted, were most amenable to the project.

The blufftop and slope areas were, for the most part, wooded and/or covered with grasses and forbs. Since the Scope of Work stipulated that no subsurface testing would be initiated, several highly probable site areas could only be given superficial attention. In terms of the erosion/migration study, however, it is highly unlikely that such terrain will be affected by the proposed river stabilization projects nor by erosion or migration.

Several areas were observed without owner/renter permission as a result of no one at home in the vicinity of the observation units. In an attempt to comply as closely as possible to the original research design, these areas were surveyed and no cultural materials were retained. This procedure is not recommended for further projects, however, since on a few occasions landowners/tenants were somewhat upset with the survey team's presence. Explanation of the project took care of the potential problems in most instances.

Climatic conditions during the field reconnaissance were good. Skies were overcast for the most part and occasional light rain during the evenings settled dust over possible surface artifacts.

Maps resulting from the ongoing river migration/erosion project which indicate channel changes were not made available prior to the field study. The after-the-fact data suggests that many of the sample reconnaissance zones were "made land" since 1850 and should not have been surveyed. The problem is discussed in the survey recommendations.

Initially, the field reconnaissance was going to include a boat reconnaissance component for better visibility of the river-cut banks. During the spring months, however, the river was extremely low and the steep banks precluded observation of potential cultural bearing matrix. As a result, bank edges were observed by looking over the sharp erosion escarpments from the high bank side.

All factors considered, the present investigators interpret the field conditions as adequate for interpretation under the Scope of Work. More opportune conditions would be present at various seasons of the year as would prior contact and explanation by Corps of Engineers to landowners/renters within the study zone as to the purposes of the project. Further, the negation of limited subsurface testing by the Scope of Work curtailed possible recovery of sites in many high potential blufftops, slopes, creek terraces, and high river terraces since these areas were the most apt to be obscured by heavy vegetation cover.

STUDY FINDINGS

The following section reviews the findings resulting from the present investigation. Archeological sites are discussed in terms of provenience, materials observed, cultural affiliation and site type, site integrity and significance, and recommendations. General results involving hypotheses and the model are included in the concluding discussion.

Within the designated survey zones there are possibly two prerecorded archeological sites: 14WB Brower 5 and 14DO83. During the present field reconnaissance, 14WB Brower 5 was relocated and 14DO83 was not.

Witty's review of the site records within the Kansas Historical Society states that 14WB Brower 5 is "A 'Harahey Village' site recorded by J. V. Brower (1903: pl. 19, p.46) near the mouth of Deep creek" (Witty 1979:22). Further, in the summary Witty notes that cultural identification of the site is undetermined, there is a map report only, and recommends that the site be confirmed (Witty 1979:39). The map supplied by the Corps indicating the location of 14WB Brower 5 places the site approximately 100 meters to the east of the area in which cultural materials were observed. The original site area designated on the Corps map was under cultivation at the time of the field reconnaissance and observation conditions were good. No evidence of an archeological site was found in the originally indicated area.

Site 14DO83 is discussed as "A site of undetermined cultural origin located adjacent to Captains creek on the floodplain of the Kansas river. The site was apparently identified on the basis of a surface collection donated to the Kansas University Museum of Anthropology. No additional information was present on the record form" (Witty 1979:16). The locational coordinates are for a quarter section of area which only touches the edge of the designated survey zone and the site is very likely located on the terrace/bluff several hundred meters to the west of the area of reconnaissance and well outside the high erosion zone.

Sites noted by Witty as perhaps located within the study area--14WY8, 14DO81, 14SH301 (or 305), and 14GE328/HBSA1--are not within or immediately adjacent to the designated study zones included in the present scope of work.

Two sites were located relatively near the designated study areas--14WB Brower 4 and the Baldwin Site (Witty 1979: 22-23)--and an attempt was made to confirm them. The 14WB Brower 4 area was in winter wheat and the field team was denied access to the Baldwin site area and confirmation failed.

The scope of work required owner permission for collection and retention of artifactual/cultural materials. During the present investigation several land owners gave such permission. However, no sites were recovered where collection/retention of materials permission was granted. The three sites recorded by the study were located on lands where land owners could not be located. As a result, materials were briefly cleaned and then photographed in the field and left in the areas in which they were recovered. Given the large number of small parcels of land scattered over one hundred and ninety miles of the river valleys which are incorporated into the sample reconnaissance area, eliciting permission from persons who also were apparently working during the day was exceedingly difficult.

Archaeological Resources

The present investigation recovered physical evidence of three archaeological sites within the sample reconnaissance zones, one previously recorded site--14WB Brower 5--and two previously unrecorded sites--14WB312 and 14GE335.

14WB Brower 5

Provenience: 14WB Brower 5 was relocated by the present field investigation. The original locational information suggests that the site is located approximately 100 meters east of the area where materials were observed. The site was located by the reconnaissance team in Wabaunsee County, Kansas and situated on a blufftop/high terrace of Deep Creek. Provenience was based on surface observation of a projectile base fragment and one waste flake (See Photo 1). The area had recently been planted and observation conditions throughout the general vicinity were adequate. Site size could not adequately be estimated given the low density material observed. Contour elevation of the site area is 1000' m.s.l. Deep Creek flows toward the northeast approximately 100 meters to the north of the site area.

Materials Observed:

Prehistoric--chipped stone

Projectile fragment--convex base, gray chert
6 mm thickness, 35 mm width (Photo 1,A) 1

Waste flake 1

Cultural Affiliation and Site Type: The observed material was not diagnostic of specific prehistoric cultural affiliation. Although Brower defined the site as a "Harahey Village", this designation was later found to be inadequate as it reflected several chronologically disparate components (Witty 1979:3). At present, given the low material density, it can only be suggested that the manifestation observed by the

present investigators was a temporary camp site. The length of the occupation/reoccupation could not be determined.

Site Integrity and Significance: Intensive agricultural use of the area for a long period of time has scattered cultural materials as well as allowed erosion of the cultural bearing matrix. The low density material observed at first suggests an interpretation of low significance in terms of National Register of Historic Place eligibility. Given the earlier possible recording by Brower and assuming he was primarily interested in dense cultural material sites, however, the site should be more intensively examined in order to more explicitly determine level of significance. It is quite possible that the site observed by Brower was a relatively shallow manifestation and that later agricultural activity has allowed complete erosion and scattering of cultural remains. In view of the past recording it appears advisable to recommend further investigation prior to significance evaluation.

Recommendations: It is recommended that 14WB Brower 5 should be resurface collected and tested by controlled excavation procedures should the site area be included in the proposed project activities. This technique would allow recovery of data necessary to evaluate the site in terms of National Register of Historic Place eligibility and indicate an appropriate cultural resource management plan.

14WB312

Provenience: This previously unrecorded site is located in Wabaunsee County, Kansas. The site is situated on a level blufftop overlooking Wells Creek and the Kansas River, 100 meters and 250 meters respectively toward the north. Contour elevation of the site area is relatively level at approximately 990' m.s.l. and gently sloping downward toward the north. The land owner could not be located and provenience was based on surface observation of lithic materials in a recently cultivated field under good visibility conditions. Site size, based on lithic scatter, is estimated at 35 by 120 meters. No features were observed in the site area

Materials Observed:

Prehistoric--chipped stone

Unifacially worked flake, gray chert 3 mm thickness, 3cm width (Photo 1,C)	1
Obsidian waste flake (Photo 1,D)	1
Utilized flake (Photo 1,E-F)	2
Chert waste flake (Photo 1,G-I)	8

Chert hammerstone (Photo 2,A)	1
Chert debitage	12
Prehistoric--ground/pecked stone	
Granite hammerstone (Photo 2,B)	1

Cultural Affiliation and Site Type: The materials are not diagnostic of specific cultural affiliation. The material density and bluff top location suggest that 14WB312 may have been a camp site and perhaps utilized on a seasonal basis. The length of occupation/reoccupation could not be determined.

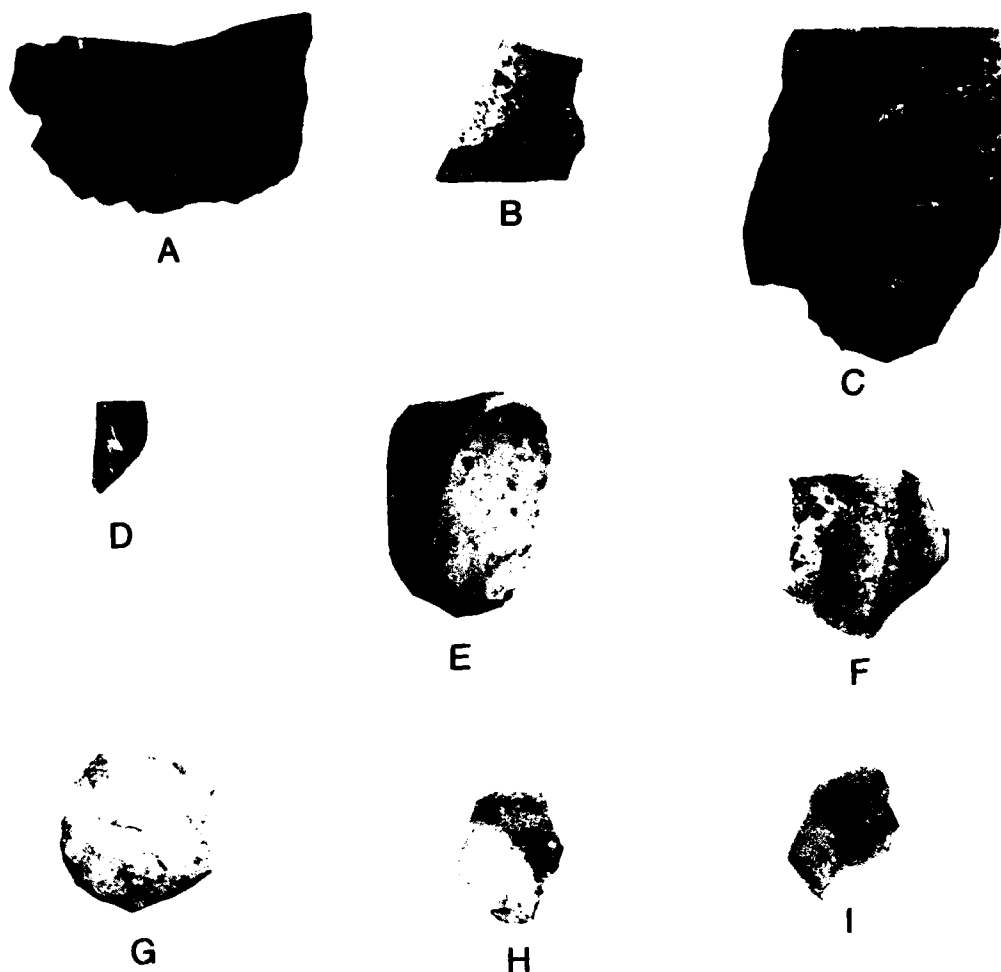
Site Integrity and Significance: The area has been cultivated for an unknown period of time and the plowzone cultural matrix has been extensively disturbed. The vertical depth and potential for sub-plowzone intact site matrix was not determined by the present investigation. Significance of the site, in terms of eligibility for nomination to the National Register of Historic Places, could not be adequately determined from surface observation alone. Further evaluation of the site would be necessary to interpret information potential of 14WB312.

Recommendations: Should the immediate area be subject to direct or indirect impact resulting from the proposed project activities, it is recommended that the site be tested by controlled excavation procedures. This technique would allow recovery of adequate data for interpretation of the level of significance of the manifestation and development of the appropriate cultural resource management plan.

14GE335

Provenience: This previously unrecorded archaeological site is located in Geary County, Kansas on a blufftop above the confluence of a small intermittent stream with the Smoky Hill River. Located 40 meters south of the Smoky Hill River, the site lies approximately 20 meters west of the small stream. Provenience was based on field observation of low density chert waste flake and debitage over a previously bulldozed, cleared area. Site size is estimated to be 30 by 30 meters and contour elevation ranges from 1110 to 1130'm.s.l. A gravel road cuts through the center of the site east to west and unknown structures have been removed to the southwest of the site area.

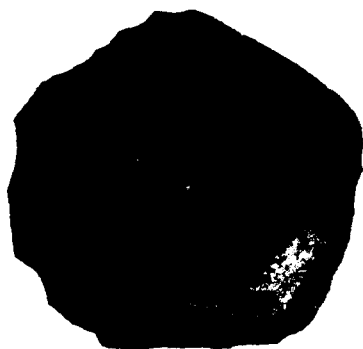
Materials Observed:	
Prehistoric--chipped stone	
Waste flake, gray and white chert	2
Chert debitage	6
Historic	
"Stoneware" sherd, brown glaze	2



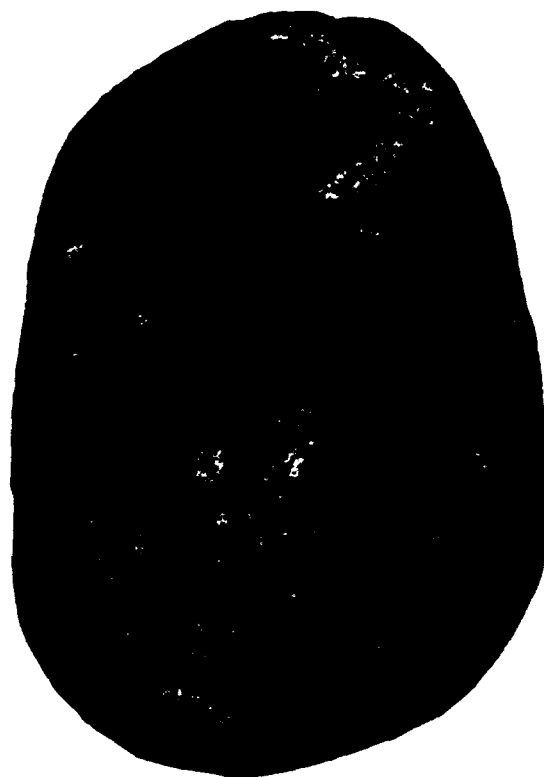
Photograph 1.

Selected Artifacts from 14WB Brower 5 and
14WB312

- A. Convex base biface fragment--14WB Brower 5
- B. Waste flake--14WB Brower 5
- C. Unifacially worked flake--14WB312
- D. Obsidian flake--14WB312
- E. & F. Utilized waste flake--14WB312
- G-I. Chert waste flake--14WB312



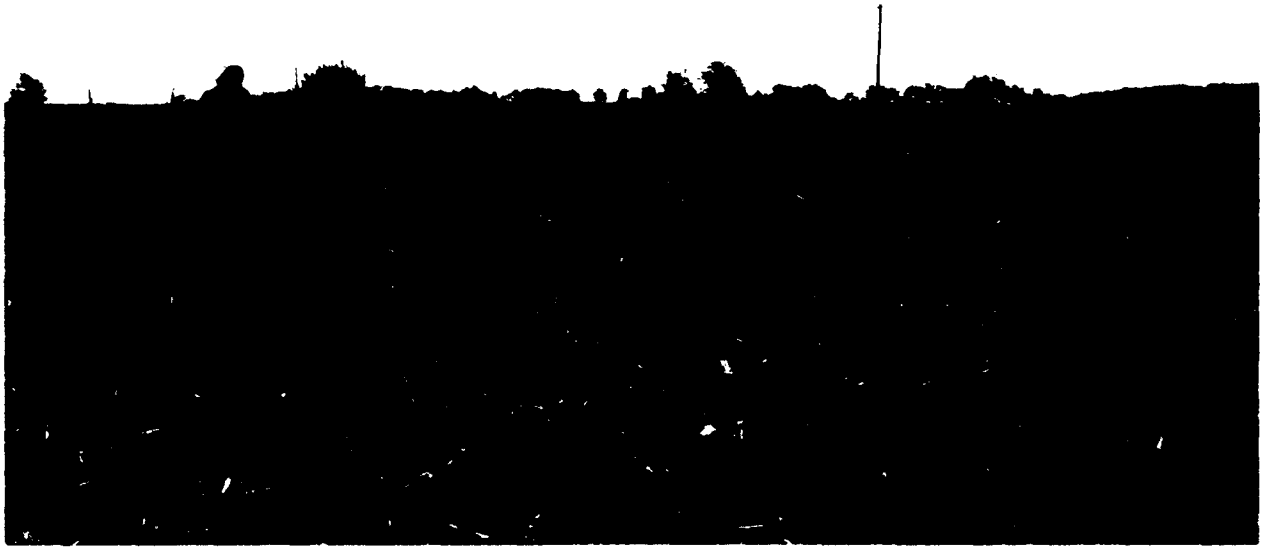
A



B



Photograph 2.
Selected Artifacts from 14WB312
A. Chert hammerstone
B. Granite hammerstone



Photograph 3. 14WB312 (View toward southeast)



Photograph 4. 14WB312 (View toward northwest)



Photograph 5. 14WB Brower 5 (View toward west)



Photograph 6. 14GE335 (View toward northwest)

Cultural Affiliation and Site Type: Aside from allowing general descriptive terms of prehistoric and historic, the cultural materials observed are non-diagnostic of cultural affiliation of the site. The low density materials suggest that the site was occupied/reoccupied on a very temporary basis, perhaps indicating a seasonal camp site related to river associated extractive/processing activities.

Site Integrity and Significance: The road cut through the site has destroyed an unknown portion of 14GE335. Further, past use of the land for agricultural purposes has scattered cultural materials. Erosion cuts in the site vicinity suggest the cultural matrix would be shallow and disturbed. The level of significance in terms of National Register eligibility is interpreted by the present investigators as quite low. The low density materials along with excellent visibility and past disturbance of the area indicate the site would contribute little to the prehistoric/historic sequence of the locality.

Recommendations: As a result of the interpretation of the level of significance of 14GE335, the present investigators recommend that the site not be considered eligible for National Register of Historic Place nomination and that no further mitigative action be required.

Discussion

The sites located by the field reconnaissance strongly suggest that archeological manifestations recoverable by surface observation in the study zones are located along terrace/blufftops situated above confluences of tributaries and the major rivers. Specifically, on the basis of the reconnaissance data, Hypothesis 1 based on O'Brien's literature review indicating high floodplain site potential is rejected since no sites were found to occur on the floodplain itself. This finding also supports Witty's interpretation of low probability of sites within the Kansas River valley (Witty 1979). Hypothesis 2, in agreement with both Witty and O'Brien, is strongly supported in that stream confluence areas were the only locations from which archeological site evidence was recovered by the present reconnaissance.

As pointed out by Witty, at least three possible explanations may account for lack of occurrence of archeological sites in the Kansas River floodplain:

1. Earlier sampling is not representative.
2. If sites were located there, they have been obliterated by flooding and other natural factors, either due to destruction by erosion or being covered over and hence buried by silting and/or both.
3. Prehistoric peoples did not utilize the floodplain to any great extent for sites of any permanence (1979:42).

In reference to the first possible explanation, the present investigation is also quite likely to be subject to nonrepresentativeness in sampling which may have had an affect on the findings of the reconnaissance. The study zones from which the 15% sample reconnaissance sample was picked are high erosion zones and not necessarily high archeological site potential areas. Further, following the present field reconnaissance, river channel migration history maps which noted river channel changes from 1850 to the present were made available to the investigators (Corps of Engineers Draft: Appendix 3). Superimposing the study zones from which the survey sample was selected over the channel migration maps indicates that approximately 40% of the study zones were river channel since 1850 (See Figure 5). This "made land" would be very unlikely to exhibit surface manifestations of extant archeological sites since it is composed of recent alluvial fill. Because of the timing involved in information allocation, the present study could not take this post-field data into account when selecting the stratified sample for reconnaissance. As a result, approximately 35% of the area surveyed in the 15% reconnaissance sample is recent (within the past 130 years) aggradation and would be quite low in terms of archeological site potential.

The second possibility suggested by Witty--aggradation/degradation--affecting site recovery cannot be adequately investigated by the surface observation techniques involved in the present reconnaissance form of study. It should, however, for the following reasons, be a major consideration during future project planning. While alluvial deposition and erosion effectively hide as well as destroy untold numbers of archeological manifestations in river valleys such as the Kansas and Smoky Hill which are not amenable to surface survey recovery, serendipitous finds occur during project excavation activities (cf. Schmits 1980). Further, recent analyses by Thompson and Bettiss (1980) quite succinctly argue that floodplain/terrace areas along the Missouri drainage in Iowa where extensive Holocene aggradation and degradation have occurred are likely to contain intact archeological sites at several meter depths which cannot be recovered by surface survey techniques (1980:44).

The third possibility suggested by Witty--limited occupation of the floodplain by prehistoric groups--appears the least acceptable alternative to the present investigators. Witty lists 126 recorded sites from Junction City to the mouth of the Kansas River, with apparently the largest percentage of them located on terraces and bluffs. O'Brien lists 36 sites along the Smoky Hill River in the general vicinity of the portion of present study zones. The draft of the Kansas River Osage River Reconnaissance (Corps of Engineers Draft: Section B) indicates that the Smoky Hill is much more stable than the Kansas River in terms of channel migration. Since voiding or covering sites, by erosion and

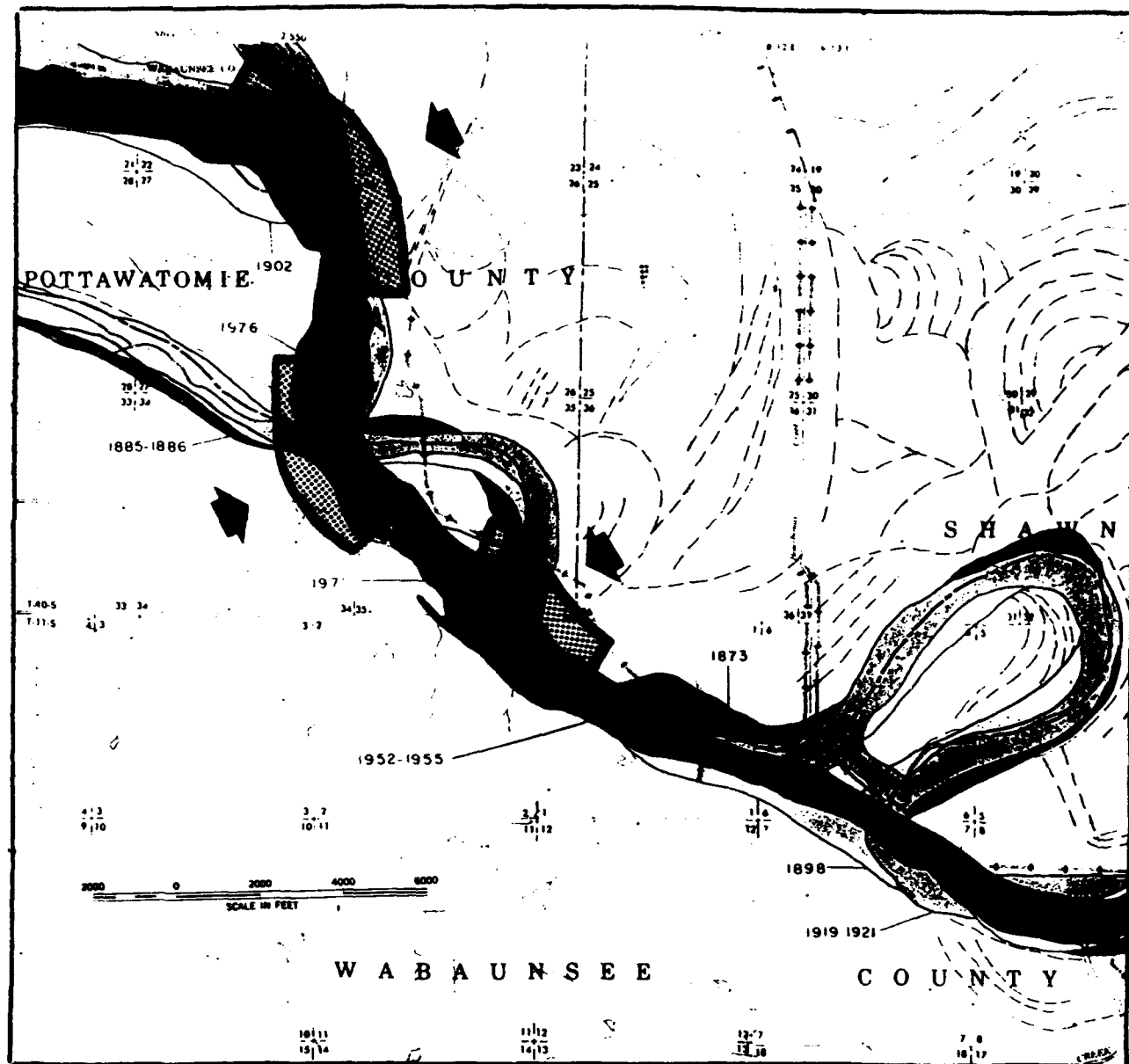


Figure 5.

Example of Past Migration Within the Study Zones



Study Zone Unit, Black Portion
Indicates River Channel Since 1850.

Area 3--Tri-County

Portion of Sheet No. 8, File No. A-1-890

Reference: Historic Channel Change Maps,

Corps of Engineers, Kansas City District

Draft: Appendix 3.

Scale as Shown

alluvial fill would be less probable in the Smoky Hill zones than in the Kansas River valley, it is more likely that floodplain surface manifestations would be exhibited in the Smoky Hill area than in the less stable Kansas River valley. O'Brien indicates that 67% of the recorded sites in her study area along the Smoky Hill were located on the floodplain or at the river edge with the remaining 33% on higher ground along the valley walls (O'Brien 1979:32). Since the floodplain was a high utilization zone by prehistoric populations in the Smoky Hill River valley, there is no reason to propose that the Kansas River valley was scorned, particularly given the floral and faunal subsistence potential associated with the larger drainage. The present investigators interpret these data as strongly suggesting that the Kansas River floodplain was occupied by prehistoric populations. The river aggradation and degradation pattern, however, would effectively hide such evidence by alluvial fill as well as voiding many sites.

Summary

The site location and study area maps supplied by the Corps of Engineers suggested that two archeological sites may have been located within the designated survey zones--14WB Brower 5 and 14D083. 14WB Brower 5 was relocated by the field reconnaissance and 14D083 was not. It is suggested that 14D083 is located above and outside the erosion zone study area. The field reconnaissance located two previously unrecorded sites--14WB312 and 14GE335. 14WB Brower 5 and 14WB312 are recommended for further mitigative considerations should the proposed project activities threaten the sites. 14GE335 is interpreted as exhibiting a low significance level in terms of National Register eligibility and is recommended for no further mitigation procedures.

All recovered archeological sites are located on terraces and bluffs near the confluences of streams and the major river in the respective portions of the study areas. Thus, Hypothesis 1 was rejected and Hypothesis 2 was supported. The negative floodplain site potential is interpreted as primarily reflecting river aggradation/degradation of cultural manifestations.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

An evaluation of the potential impact the proposed Kansas and Smoky Hill Rivers Stabilization Project may have on the archeological resources located within the study zones is presented within the following section. This appraisal is based on information collected from previous investigations and physical inspection of designated areas within the project area.

The proposed project, as outlined in the Scope and Goals section of this report, specifically would affect selected portions of river valley terrain; primarily those areas adjacent to the present river channel. Given the present investigation represented only a preliminary evaluation, all possibly significant archeological resources in the floodplain have not been considered. When the plans for the Corps project become solidified, it is recommended that further assessment be initiated of herein defined areas which will be affected so that no significant cultural resource is damaged or destroyed.

In order to assure the non-renewable cultural resources located within and peripheral to the proposed projects are not inadvertently damaged or destroyed, the following mitigative actions should be considered. However, interjection of unknown variables or additional data may affect the final evaluation of this area. These factors obviously cannot be foreseen.

Recorded Archeological Resources

The present preliminary investigation located two previously unrecorded sites--14WB312 and 14GE335--and one recorded site--14WB Brower 5. Initial evaluation of the manifestations indicates that 14WB Brower 5 and 14WB312 should be given further mitigative consideration prior to project related disturbance in order to more clearly ascertain their level of significance under National Register of Historic Place eligibility criteria and allow development of appropriate resource management plans should the evidence warrant such action. Site 14GE335 is recommended for no further mitigative action.

The areas in which 14WB Brower 5 and 14WB312 are located are tentatively planned for hardpoint stabilization. This procedure consists of placement of stone spaced intermittently along an eroding bankline. The structures protrude only short distances into the river channel and can be supplemented with a root section extending landward to preclude

flanking should excessive erosion persist (Corps of Engineers Draft:B-12). Since both 14WB Brower 5 and 14WB312 are located from 100 to 300 meters from the river bank, it is highly unlikely that direct project impact will affect the resources. There is, however, the possibility that indirect impact might result from movement of machinery necessary for project construction. In the event that any applicable project activities are scheduled within the vicinity of these sites and there exists a possibility that such activities will directly or indirectly affect these archeologically sensitive areas, it is recommended that further evaluation be initiated in the form of resurface collection and controlled subsurface testing in order to determine the research/preservation potential of these manifestations and to ascertain eligibility for inclusion to the National Register of Historic Places. If eligible, then Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665) would be applicable and appropriate mitigative action should be taken.

General Recommendations

As outlined in the discussion section of the survey results, it is suggested that the river valley floodplains are highly likely to contain buried extant archeological resources, particularly the areas near and around the confluences of streams with the major rivers. The particular environmental conditions which are generally associated with a major riverine system such as the Kansas and Smoky Hill Rivers would have offered a diverse array of ecological niches, within both the river valleys and adjacent bluffs, which would have provided a substantial and varied subsistence resource base. These resources could be and undoubtedly were effectively exploited by several indigenous populations. It is suggested that there is a probability that the floodplain as well as adjacent bluffs within the study area were occupied, possibly by several pre-historic and historic cultures. Struever's findings (1968) in the Illinois River valley cogently point out the potential of old river beaches and high floodplain ground as does the Smoky Hollow analysis in the Missouri River drainage (Thompson and Bettis 1980).

Within the project area sites may have been covered to a substantial depth by alluvial and colluvial sedimentation. Sites possibly containing several components, each representing a different culture and separated by several meters of sediment, could be present. Professor Emeritus James Bee, formerly of Kansas University, Lawrence and long time observer of the Kansas River, told the present investigators that while he had found no in situ cultural evidence in the river valley, he had recovered an extensive collection of ceramic sherds from gravel and sand bars (Personal Communication: James Bee). It is

apparent that the cultural materials have had to erode from points along the floodplain being cut by river channel migration or by wash from higher elevations. While the investigation found no substantiated evidence of deeply buried prehistoric components within the Kansas and Smoky Hill River valleys, similar riverine contexts previously noted suggest that this is a probable phenomenon. Further, the Thompson and Bettis study (1980) strongly suggests that standard surface survey and controlled testing in similar riverine environments is an inefficient means of recovery of prehistoric occupation in that such manifestations are quite often buried under several meters of alluvial fill.

It is the conclusion of this study that the existing data suggest that further intensive archaeological surveying of the proposed Kansas and Smoky Hill Rivers Stabilization Study zones would produce little additional data and therefore be unwarranted. This conclusion is generally in accord with the previous literature and record search by Witty (1979). The sites recovered by the present reconnaissance are on higher elevations of the river related terrain, well away from high erosion zones. No evidence of utilization of the floodplain itself was recovered. However, it is possible that direct and ancillary project activities within the project areas could expose unknown buried sites if these are present. Equipment movement, removal of topsoil and vegetation covering could increase erosional action and would represent other sources of potential resource disturbance. Indirect and/or long range impact may also result from increased land alterations stimulated by additional protection from the threat of erosion and migration in specific areas.

As outlined in the Archaeological Conservation Act (P.L. 93-291) and Section 2b of Executive Order 11593 of May, 1971, it is the responsibility of any agency involved in a federal action to initiate appropriate measures to assure no significant cultural resource is irretrievably damaged or destroyed and to exercise caution until the culturally significant resources located within a project area under its jurisdiction can be fully recorded and fully evaluated to determine eligibility for inclusion to the National Register of Historic Places.

For the aforementioned reasons, it is recommended that provisions be made to retain a professional archaeologist to periodically monitor any project related earthmoving activities conducted within the proposed project areas. Where such project activities will affect areas near and surrounding the confluences of streams with the major rivers, the monitor should specifically observe these zones for evidence of potentially significant archaeological manifestations to depths of several meters. If necessary, emergency archaeological recovery of potentially significant sites, as authorized in Section 3 of the Archaeological Conservation Act (P.L. 93-291) would be initiated. This method will provide the necessary data to ascertain the research/preservation potential of a site,

determine the eligibility for inclusion to the National Register of Historic Places and allow further evaluation to be made as to the appropriate mitigative actions to be taken. If eligible, then Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665) would be applicable.

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Section A. The Study and Report
Section B. Streambank Erosion
Appendix 2. Channel Migration
Appendix 3. Historic Channel Change Maps
Appendix 4. Land Use Compilation Data
Appendix 5. Land Use Maps
Appendix 8. Geology and Surveys
Appendix 9. Hydrology and Hydraulics
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Personal Communication

June 1980

Professor James Bee. Professor Emeritus,
Kansas University, Lawrence, Kansas.

APPENDIX A
Correspondence

Kansas State Historical Society

120 West Tenth • Topeka, Kansas 66612 • 913/296-3251

October 16, 1980

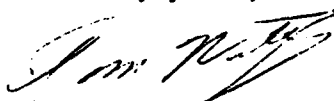
Craig Sturdevant
Environmental Research Center
719 Hochin St.
Jefferson City, MO 65101

Dear Craig:

In response to your call seeking verification of site forms submitted in regard to the preliminary reconnaissance of the Kansas river/Smoky Hill river stabilization study for the Kansas City District, Corps of Engineers, we did receive forms for previously identified sites of 14WB5, 14WB312 and 14GE335.

The information which you forwarded to us has been incorporated into our site files.

Sincerely yours,


Thomas A. Witty, Jr.
State Archeologist

TAW:bn



JOSEPH W. SNELL, Executive Director
ROBERT W. RICHMOND, Assistant Executive Director
PORTIA ALLBERT, Librarian
EUGENE D. DECKER, State Archivist
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THOMAS A. WITTY, State Archeologist
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EXECUTIVE COMMITTEE: Clifford R. Hope, Jr., Garden City; Willard Ragle, Emporia; Jane R. Robison, Dodge City; William H. Sells, Emporia; Helen L. Smith, Colby; Homer E. Socotolsky, Manhattan; Floyd R. Souders, Chaney; Arthur J. Stanley, Leavenworth; Calvin Strwig, Abilene.

APPENDIX B
Personnel Qualifications

Craig Sturdevant/Director of Environmental Research Center
719 Houchin
Jefferson City, Missouri 65101
(314) 635-9569

Birth Date: April 20, 1943
Married

Educational Background:

B.S. Sociology	University of Iowa, Iowa City 1967
M.A. Anthropology	University of Iowa, Iowa City 1971
PhD course work completed	University of Missouri, Columbia

Employment Background:

Teaching Assistant and Research Assistant	University of Iowa 1967-1971
Instructor of Sociology and Anthropology	Lincoln University 1972-1975
Assistant Professor of Sociology and Anthropology	Lincoln University 1975-present

Business Background:

Contractor and Sub-contractor/Construction	Iowa City, Iowa 1965-1972
Director/Owner Environmental Research Center	Jefferson City, Missouri 1976-present

Experience (Archaeology/Academic):

Developer and Coordinator of Lincoln University Archaeology Area
and Archaeology Laboratory
Teacher of Archaeology Theory, Methods, Archaeology Survey,
Archaeology Research Design and Data Analysis
Project Director: Moreau River Valley Surveys I, II, and III, Algoa
Cultural Resource Survey, and Church Farm Survey--Contractual
agreements between Lincoln University and Missouri Department
of Natural Resources. Director of Algoa (23CO156) Salvage Project

Reports Published (Archaeology):

A Preliminary Cultural Resource Reconnaissance Within the Lower
Kansas River Valley: Wyandotte County, Kansas, with M. Weichman.
Corps of Engineers, Kansas City District. Library of Congress
Number 77-78865. 1977

An Intensive Cultural Resource Survey of Algoa Reformatory. Department
of Natural Resources, Jefferson City. Lincoln University Archaeology
Research Series, No. 1. 1977

Moreau River Valley Survey I. Missouri Department of
Natural Resources, Jefferson City. Lincoln University
Archaeology Research Series, Vol. 2.

Moreau River Valley Survey II. Missouri Department of
Natural Resources, Jefferson City. Lincoln University
Archaeology Research Series, Vol. 3.

Moreau River Valley Survey III. Missouri Department of
Natural Resources, Jefferson City. Lincoln University
Archaeology Research Series, Vol. 4. In Progress.

Professional Memberships

Society for Cross Cultural Research

Missouri Association of Professional Archaeologists

Association for the Advancement of Science

American Anthropological Association

Cultural Resource Consulting/Corps of Engineers

Smithville Oral History Mitigation Program. U.S. Army
Corps of Engineers, Kansas City District. In Progress.

Cultural Resource Consulting/Private Agencies

At present, there are approximately 46 completed cultural
resource surveys on file at the Missouri DNR/SHPO authored
by C. Sturdevant and covering from over 20,000 acres of
area to less than 1 acre. A complete listing is available
upon request.

Ruthi Sturdevant
719 Houchin
Jefferson City, Missouri 65101
(314) 635-9569

Educational Background:

B.A. Mathematics Major, Anthropology Minor	Lincoln University, Jefferson City 1973
M.A. Mathematical Statistics	University of Missouri, Columbia 1976
PhD. Candidate, Statistics	University of Missouri, Columbia

Experience:

Teaching Assistant--Statistics	University of Missouri 1973-9
Consultant to PhD. candidates	1975 to present
Environmental Research Center	1976 to present
Statistician and Architectural Historian	

Chris Hansman
Environmental Research Center
Field Office
Cairo, Missouri
(816) 263-5434

Archeology Student	Northeast Missouri State, Kirksville, Missouri
Long Branch Reservoir Survey and Testing	1977 & 1978 Field Season
Environmental Research Center Field Survey and Excavation	1979 to present

Jackie Rogers
Kirksville, Missouri

Archeology Student	Northeast Missouri State, Kirksville, Missouri
Long Branch Reservoir Survey and Testing	1978 Field Season
Cannon Reservoir Survey and Testing	1979 Field Season
Environmental Research Center Field Survey and Excavation	1979 to present

APPENDIX C
Scope of Work

10 September 1979

ARCHEOLOGICAL RECONNAISSANCE
KANSAS AND SMOKY HILL RIVERS BANK STABILIZATION STUDY, KANSAS

Scope of Work

1. INTRODUCTION

a. The Government is currently engaged in a study to develop plans to correct problems associated with bank erosion and channel migration on the Kansas and Smoky Hill Rivers, Kansas. Eight (8) zones of severe erosion and migration totaling approximately 3,900 acres have been identified and are designated the study area. This study area, in eight noncontiguous parcels, totals approximately 32 miles in length and is limited to an area 1,000 feet from the bank in the erosion areas outlined on the inclosed map (Incl 1).

b. A reconnaissance shall be performed to locate archeological resources within the study area. Archeological resources identified will be investigated to determine their potential eligibility for listing on the National Register of Historic Places and their significance relative to the bank stabilization study.

c. To date, the following cultural resources reports are results of work funded by the Corps of Engineers.

1979-White, R. Gail. "Preliminary Assessment, Historic Sites and Architecture, Kansas River and Tributaries, Kansas."

Witty, Thomas A., Jr. "Preliminary Archeological Literature Search, Eastern Portion of Kansas River and Tributaries, Bank Stabilization Study, Kansas." (Draft)

O'Brien, Patricia J. "Preliminary Archeological Literature Search, Western Portion, Kansas River and Tributaries, Bank Stabilization Study, Kansas." (Draft)

d. The work defined herein to be performed by the Contractor is required by the National Environmental Policy Act of 1969 (PL 91-190) and the National Historic Preservation Act of 1966 (PL 89-665) and is authorized for funding under Public Law 86-523 as amended by Public Law 93-291.

2. SCOPE

a. This study encompasses archeological reconnaissance of 15 percent (approximately 580 acres - the reconnaissance area) of the identified zones described in 1.a. The field reconnaissance for this study will consist of an on-the-ground surface examination of the reconnaissance area to obtain preliminary, predictive data on the distribution and nature of archeological sites, to provide a general impression of the value of the sites, and the probable impact of future plans on the sites. A literature search and records

review recently completed (see 1.b.) will provide some background data for the reconnaissance. The Contractor shall conduct this study in a professional manner, using the accepted methodology in accordance with 33CFR305 and the proposed 36CFR66.

b. The Contractor shall be responsible for the preparation of a report of findings, fulfilling the requirements stated below.

3. STUDY APPROACH

The Contractor shall perform the following activities as the requirements of the contract to complete the 15 percent archeological reconnaissance of the study area.

a. Preliminary Work.

(1) Prior to development of the research design, the Contractor shall review previous reports, survey forms, records, and pertinent library sources concerned with cultural resources within the study area for archeological information.

(2) A research design will be completed as stated in 33CFR305.18 and approved by the Government prior to the initiation of field work.

b. Reconnaissance. Conduct a 15 percent archeological reconnaissance of each of the study areas listed below and outlined on the inclosed maps (Incl 2). Recovery of data and cultural material shall be in accordance with 33CFR305 and the proposed 36CFR66. Proper curation of any recovered materials and documentation of data is vital.

<u>Area (River Miles)</u>	<u>Appendix "F" Plate No.</u>	<u>River Distance (Ft.) of Ero- sion Areas</u>	<u>Total Study Area in Acres</u>	<u>(Reconnaissance Area in Acres)</u>
1. Eudora-Fall Leaf Schaaque Bend (34.8-49.6)	5, 6	44,000	1010	(151)
2. Lawrence Lakeview (51.9-61.0)	6, 7	13,000	298	(45)
3. Tri Co. St. Marys (106.8-115.6)	10, 11	19,000	436	(65)
4. Belvue (115.6-120.0)	11, 12	13,000	298	(45)
5. Wabaunsee (129.0-135.0)	12	13,000	275	(41)
6. Swamp Angel (139.0-146.0)	13	22,400	514	(77)

7. Smoky Hill #1 (12.0-16.0)	32	15,600	351	(53)
8. Smoky Hill #2 (30.2-42.5)	33	30,000	690	(104)
TOTAL	170,000 ft.	(32.2 mi)	3,902 acres	(582 acres)

(1) Problem Orientation. This study is to be oriented toward a 15 percent reconnaissance of the study area to locate and evaluate archeological sites that may be threatened by future plans for stabilization of the river, erosion or channel migration. Existence and condition of sites tentatively identified or predicted from the literature search will be verified. Areas where sites are lacking will be identified and a model predicting distribution of sites in the study area will be developed.

(2) Methodology. In performing the site investigations, the Contractor shall, in accordance with the research design, use accepted and appropriate field and lab methods described in the proposed 36CFR66 including, but not limited to, the following:

(a) Conduct a reconnaissance of 15 percent of the study area as described above. If any new sites are encountered, site numbers shall be coordinated with the Kansas State Historical Society.

(b) Restrict work to surface observation to discover sites and to delineate site boundaries. No subsurface testing will be conducted.

(c) Collect a sample of surface cultural materials at each site only when permission has been granted by the landowner.

(d) Record provenience of features, including maps and graphs when applicable.

(e) Photograph or illustrate diagnostic features and artifacts by either black and white photography or line drawings.

(f) Restrict analysis to functional identification and temporal placement of cultural materials encountered. No extensive analysis of data recovered is required by this study.

(g) Perform all measurements using the metric system.

(h) Process, catalog, and prepare for curation, any recovered materials.

(i) Determine which known and new sites require further testing of any kind and indicate relative significance for ranking priorities in accomplishing recommended work.

(j) Identify and outline a plan of intensive survey for the study area lands. Construct a predictive model for prehistoric cultural resources in the unsurveyed portion of the study area. Indicate which parts of the study area should have priority for future studies, if any, and why.

4. SCHEDULE OF WORK

a. Coordination and Meetings. The Contractor shall pursue the study in a professional manner to meet the schedule specified. All work to be performed by the Contractor shall be closely coordinated with the appropriate Corps of Engineers Cultural Resources Coordinator.

(1) The Contractor shall review progress of the work performed with representatives of the Corps of Engineers and the State Historic Preservation Officer (SHPO).

(2) The Contractor shall attend one meeting in the Kansas City District Office to discuss the review of the draft of the report.

(3) By written request, the Contracting Officer may require the Contractor to furnish the services of technically qualified representatives to attend coordination meetings in addition to the one specified above. Payment for such services will be made at a rate per hour for the discipline(s) involved plus travel expenses computed in accordance with Government Joint Travel Regulations in effect at the time travel is performed.

b. Report Content and Schedule.

(1) A report of findings shall be prepared by the Contractor. The main text of the report shall be written in a manner suitable for reading by persons not professionally trained as archeologists. Detailed presentation and discussion of data of interest to the archeological profession shall be included in a second part of the report or as appendices. The report is intended for use of and interest to the general public as well as of value to the profession. Use of illustrations is encouraged.

(2) The report of findings shall be authored by either the principal investigator or project director. The principal investigator is the person responsible for day-to-day activities including field supervision, analysis of work, and write-up of the initial draft of the report. The project director is that person who oversees and administers the contract or purchase order and who does the final editing of the report. The archeologist (regardless of title) whose credentials are used to justify the assumption of professional work being performed preferably should be the author or at least the co-author of the report.

(3) Thirteen (13) copies of a complete draft of the report shall be submitted to the Contracting Officer for the purpose of Governmental review within eight (8) months after receipt of notice to proceed. If excessive inclement weather or other delays occur, this date may be extended to one mutually agreed upon between the Government and Contractor. In addition to standard review procedures, the Government may (at its discretion) send the draft report and Scope of Work to three qualified professionals not associated with a State or Federal Governmental agency for peer review of the merits and acceptability of the report. After a review period of approximately two (2) months, the Government will return the draft to the Contractor. The Contractor then shall complete necessary revisions and submit the final report, which shall be professionally edited, within two (2) months after receipt of the reviewed draft. The Contractor shall submit one set of originals and two copies of the final report of findings to the Government. The copies shall include all plates,

maps, and graphics in place so that they may be used as patterns for assembling the final report. The Government will edit the final report and after approval will reproduce this report and provide the Contractor 10 copies for personal use plus 2 copies for each major contributing author. Total time shall not exceed 12 months from the date of receipt of notice to proceed.

(4) The report shall include the following:

(a) An abstract and a brief narrative summary of the work performed in this study;

(b) Description of the study area, including topography, hydrology, geology, soils, flora and fauna;

(c) A description of the culture history of the study area and a discussion of each type of archeological resource encountered or which may reasonably be expected to occur within the study area;

(d) A detailed description of the methods used in field and lab work;

(e) A discussion of each site investigated by this study and past studies conducted within the study area and identification of data mentioned in 3. Study Approach. A detailed description of sites and limited discussion of the artifacts encountered, presented both in support of the discussion in the text and also as valuable data for professional use of the report.

(f) A site specific discussion of recommendations with justification for protection and management of known sites including:

1. Brief narrative describing the relative significance of sites located and priorities for work to be done at a later date including an intensive survey outline;

2. Statements of potential eligibility for nomination to the National Register of Historic Places, if any;

3. Action, if any, to be applied to all sites; if no action is to be applied to a site, so state in the body of the report.

(g) Illustrations, photos, maps, tables, and graphic representations of data appropriate to the text such as illustrations of diagnostic artifacts;

(h) One map showing those areas that were examined for cultural resources during this study and also those areas which were investigated within the study area in past studies. This map shall include all sites and show which sites were investigated in each study and indicate areas investigated in which no sites were found;

(i) A glossary of terms;

(j) Reference section with all sources referred to in text or used for report, personal communications, interviews, bibliography, etc.;

(k) Copies of all correspondence pertaining to review of the draft report. These are to include the comments of the State Historical Preservation Officer, Heritage Conservation and Recreation Service, peer reviews (if applicable) by professional archeologists requested by the Government, together with responses to each of the comments given. The Scope of Work is to be included in this section; and

(1) List of principal investigators and field and lab personnel with their qualifications as an appendix.

(5) The final drafts and two copies of the report shall be typed single-spaced on one side of paper with the margins set for reproduction on both sides of 8 x 10½ inch paper. One of the copies shall be assembled in accordance with the attached style sheet.

c. Other Information. Five copies of materials not suitable for publication in the report shall be submitted with the draft. These materials include feature maps, large amounts of specialized statistical analysis data, repetitious photographs, a complete listing of all materials recovered, where records are maintained, and other documentation.

d. Materials Not for Release. Materials dealing with exact archeological site locations are considered Confidential and are not to be published or released. Materials which shall accompany the report but which are not to be included in the report consist of:

(1) Five (5) copies of 7½ minute USGS base maps indicating exact locations of all archeological resources and areas which were physically surveyed, including two of which are to be furnished directly to the SHPO. (If 7½ minute USGS maps are not available, 15 minute maps shall be used.)

(2) Five (5) copies of survey forms for newly recorded sites discovered incidental to this contract, including two copies which will be furnished directly to the SHPO.

(3) Tables showing approximate location of each site, site designation, relation to study features, types of threats, and recommended actions, if any.

(4) Photographs of representative cultural resource sites and collections from this study, if any.

e. Storage of Materials. Attached to the letter of transmittal for the final report shall be a listing of all cultural materials found during the field investigations, and a Certificate of Authenticity for these materials. Collections shall be properly stored in containers clearly marked "Property of the U.S. Government, Kansas City District, Corps of Engineers." These materials shall be stored at a qualified Kansas repository, if possible, or at a repository mutually agreed upon by the Government, the Contractor, and the State Historic Preservation Officer. Retrieval of these materials by the US Army Corps of Engineers for use by the Government is reserved. If the materials are to be removed from the curatorial facilities, this action must be approved in writing by the Contracting Officer.

5. FURTHER RESPONSIBILITIES OF THE CONTRACTOR AND GOVERNMENT

a. Additional Work. The work identified in this document shall be complete in itself. There will be no assurance from the Government that additional work will follow, nor should such work be anticipated.

b. Data Availability. The Government shall provide the Contractor with available background information, maps, remotely sensed data reports (if any), and correspondence as needed. In addition, the Government will provide support to the Contractor regarding suggestions on data sources, format of study outline and report, and review of study progress.

c. Right-of-Entry and Crop Damages. Compensation for damages to crops shall be the responsibility of the Contractor. It will be the responsibility of the Contractor to obtain right-of-entry on lands not in Government ownership.

d. Publication. It is expected that the Contractor and those in his employ, may during the term of the contract, present reports of the work to various professional societies and publications. Outlines or abstracts of those reports dealing with work sponsored by the Corps of Engineers shall be sent to the Kansas City District Office for review and approval prior to presentation or publication. Proper credit shall be given for Corps of Engineers' sponsored work, and the Corps of Engineers shall be furnished six (6) copies of each paper presented and/or published report.

e. Court Testimony. In the event of controversy or court challenge, the Contractor shall make available, as appropriate, expert witnesses who performed work under this contract and shall testify on behalf of the Government in support of the report findings. If a controversy or court challenge occurs and testimony of expert witnesses is required, an equitable adjustment shall be negotiated.

f. Safety Requirements. The Contractor shall provide a safe working environment for all persons in his employ as prescribed by EM 385-1-1, "General Safety Requirements," a copy of which will be provided by the Government.

g. Evaluation for National Register. The Contractor shall assess all sites within the study area to determine if they are potentially suitable for nomination to the National Register of Historic Places, and shall make recommendations to the Government for the preservation, management, and nomination of those sites which appear to qualify. In those cases where the Contractor does not feel that the site is potentially eligible for the National Register, he will support his decision by facts and give his rationale justifying the decision.

6. STAFF AND FACILITY REQUIREMENTS

a. Project Director and Archeologist. Minimum qualifications are set forth in the proposed 36CFR66, Appendix C, which is provided on page 5381 in the Federal Register, Volume 42, No. 19 - January 28, 1977.

b. Consultants. Personnel hired or subcontracted for their special knowledge and expertise must carry academic and experiential qualifications in their fields of competence.

c. Equipment and Facilities. The Contractor also must provide or demonstrate access to adequate office space for proper treatment and storage of records like to be obtained from the project.

APPENDIX D
Reviewer Comments and Responses

Kansas State Historical Society

120 West Tenth • Topeka, Kansas 66612 • 913/296-3251

August 21, 1980

Paul D. Barber
Chief, Engineering Division
Attn: MRKED-BR
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Dear Mr. Barber:

Staff review of the draft report "Archeological Reconnaissance, Kansas and Smoky Hill Rivers Bank Stabilization Study, Kansas" by Environmental Research Center has been completed. We find the report acceptable and generally agree with its recommendations. The report has several good points, including a good review of the archeology of the study area.

One point we would criticize is the lack of surface collections made from the sites that were located in the survey. An artifact collection is an important site record. If properly curated the collection can be a useful source of information about the site for years to come. Making such a record should be given priority by the archeologist.

The description of the survey was too brief, since only general statements about field conditions were made. A specific description of the land surveyed in each of the study areas should be provided in order for the reader to visualize the work done.

We would agree with the recommendation that no further survey be done in the eight study areas. The basis for the recommendation for periodic monitoring of earthmoving activities in these areas is not clear, however, since the proposed work seems to be the addition of material to the eroding areas and not removal of material.

Despite these critical comments we feel this report is one of the better consultant's reports prepared for the Kansas City district.



JOSEPH W. SNELL, Executive Director
ROBERT W. RICHMOND, Assistant Executive Director
PORTIA ALLBERT, Librarian
EUGENE D. DECKER, State Archivist
MARK A. HUNT, Museum Director
THOMAS A. WITTY, State Archeologist
PATRICIA A. MICHAELIS, Curator of Manuscripts
FORREST R. BLACKBURN, Director of Publications
RICHARD R. PANKRATZ, Director, Historic Preservation Dept.
THOMAS P. BARR, Historic Properties Supervisor
LARRY JOCHIMS, Research Historian
M. D. KIDWELL, Fiscal Officer

NYLE H. MILLER, Executive Director Emeritus
EDGAR LANGSDORF, Executive Director Emeritus

OFFICERS: President, Sr. M. Evangeline Thomas, Salina; 1st Vice-President, William E. Unrau, Wichita; 2nd Vice-President, Donald R. McCoy, Lawrence; Secretary, Joseph W. Snell, Topeka; Treasurer, Robert W. Richmond, Topeka.

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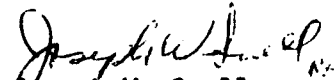
Mr. Paul D. Barber

-2-

August 21, 1980

The requirement, in the scope-of-work of this project, for obtaining the landowner's permission before making a collection of artifacts was a problem for the contractor since sites were found but landowners were not. If the Corps intends to keep this requirement for future scopes-of-work, it should be accompanied by a requirement to document efforts made to locate the owners of property on which sites are located.

Very truly yours,



Joseph W. Snell
State Historic Preservation Officer

JWS/maw

cc: Tom Witty

The investigators wish to thank the Kansas State Historical Society for their constructive criticism and commentary in reference to the present report.

Comment 1: The present investigators agree with the reviewer that surface collections are an important component of cultural resource management and a valuable lasting source of information. As stated in the Scope of Work, however, surface collections could only be retained with land owner permission which was not obtained in any of the areas in which sites were located by the reconnaissance team.

Comment 2: Request for further specific survey zone information. Initially a table was prepared which supplied information that included terrain, current vegetation, and visibility conditions for each of the sample reconnaissance areas. Since the area included small portions of river valley spread out over 190 miles, topographic sheet representation was too cumbersome to utilize as a referent for the table. The Corps was asked for smaller scale river valley maps for referent use. After discussion, it was decided that the U.S.G.S. topographic sheets supplied to the Corps as part of the Scope of Work requirement which contained the exact locational information would be adequate and the smaller scale maps were not supplied. It was felt by the principal investigator that the listing of environmental information with no visual reference in terms of location would supply little to the reader. As a result, the table was not included and the report is left lacking in this respect.

Comment 3: Justification for periodic monitoring. The indirect evidence noted on pages 42 and 43 suggests that buried manifestations would be found in the river valleys. The recommendation that the project be subject to periodic monitoring, particularly in higher probability zones represented by confluence areas, would apply only if earth moving/excavation activities were to be carried out during stabilization procedures.