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CENTER FOR ARCHAEOLOGICAL RESEARCH

ARCHAEOLOGICAL INVESTIGATIONS IN THE OZARK NATIONAL SCENIC RIVERWAYS, 1984-1986

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Conducted for

The National Park Service
Midwest Archeological Center
Lincoln, Nebraska
U.S. Department of the Interior
Contract No.: CX-6000-1-0054

by the

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Center for Archaeological Research, Project No. CAR-675
March, 1987

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ACKNOWLEDGEMENTS

The investigators wish to thank numerous individuals who gave of their time and expertise to help make the research efforts reported in this document a success. First, we wish to thank Mr. Art Sullivan, Superintendent of Ozark National Scenic Riverways for assisting us in expediting the project. Our gratitude is extended to Dr. F.A. Calabrese of the National Park Service, Midwest Archeological Center, for allotting funds for this study. Special thanks go to Dr. Mark Lynott of the Midwest Archeological Center who coordinated and supervised all research activities. We appreciate his enthusiasm for the project and his untiring assistance and guidance in the field. We also wish to thank several park rangers who took us to remote areas of the park in 4-WD vehicles and ferried us across the Current River in boats. Special thanks go to the local individuals with private artifact collections who gave freely of their time and knowledge so that an unparalleled data base on the material cultures of Ozark National Scenic Riverways could be compiled. Individuals listed above and many more made the project an extreme success by assisting us in reaching, and ofttimes exceeding, our research goals.

FORWORD

James E. Price, Principal Investigator

This document presents the results of the final year of research in Ozark National Scenic Riverways of a 5-year research endeavor. This rather long-term project has been a multistage research activity involving several scientific subdisciplines with an ultimate goal of understanding and explaining man's changing use through the millenia of the Current and Jacks Fork drainages in the southeastern Missouri Ozarks. Four previous reports have expanded the archaeological and natural environmental data base.

Major contributions were made by locating, excavating, and describing prehistoric and historic archaeological sites in the study area. Dr. Roger Saucier has presented significant new data on the geomorphology of the Current and Jacks Fork valleys. Drs. Paul and Hazel Delcourt; E. Newman Smith; and JoLee Gardner have generated new data on past climates and vegetation from their palynological analyses of Late-Quaternary lacustrine sites in the southeastern Missouri Ozarks and Ozark Border region based on core samples from Cupola Pond, Big Wolf Pond, the Big Sink and Powers Fort Swamp.

This fifth and final report summarizes the research conducted in the course of the project. As principal investigator of this project and as a native of the Current River valley it is with no small amount of pride that the other investigators and I have added new data and insight into the prehistory, history, and natural environment of Ozark National Scenic Riverways.

SECTION I
SUMMARY OF RESEARCH ACTIVITIES

Cynthia R. Price
and
James E. Price

INTRODUCTION

As the 5-year Ozark National Scenic Riverways Archaeological Project draws to a close the research team can look at the results with a sense of achievement. As in any such endeavor progress often seems frustratingly slow. But, field work was completed, analyses done, and manuscripts prepared and in the end a voluminous new data base exists on the past natural and cultural environments of the Current and Jacks Fork Valleys. To all team members concerned the results far exceed those initially anticipated. As the Principal Investigator who observed the project from conception to completion I attribute the project's success to the unparalleled enthusiasm and dedication of the highly professional and qualified individuals who formed the research team. At no time during the course of the project did any personal conflicts arise among team members. Data were shared and each team member took pride in the achievements of fellow team members. It has been a pleasure to work with Dr. Mark Lynott of the National Park Service, Midwest Archeological Center. He constantly offered encouragement and assistance in all facets of the project and kept it expanding by suggesting new and innovative approaches. He spearheaded preparation of articles for various publications which kept colleagues informed on the results of our research.

Dr. Roger Saucier provided valuable input into the project not only in his geomorphological studies but as a scholar cognizant of the demands of archaeological research. His mild-mannered personality was a steadying force in the project. It is a great source of pride for the

team that Roger received the Society for American Archaeology Fryxell Award for multidisciplinary studies during the course of the project.

There was also the unbounded enthusiasm of Drs. Paul and Hazel Delcourt, palynologists, of the University of Tennessee who bolstered the project with their expertise. Their very lives are consumed by the study of past vegetation and climates and each small achievement in their field research was a personal triumph. It was truly a pleasure to work with a husband and wife team of the professional caliber as the Delcourts.

My wife, Cynthia R. Price, guided the historical archaeological research during the project and worked diligently to collect data on 19th century Euro-American lifeways in the region and apply them to models she has been building for years. Not only did she engage in all aspects of the research; but also she did the accounting, completed site forms, and performed myriad other thankless but necessary tasks that made the project a success.

Dr. Tom Boutton gave valuable assistance to the project in a study of the detection of maize in the human diet through collagen studies which permitted the publication of a definitive article on when maize became important in man's diet in the region during the prehistoric past.

Kathy Boswell, our secretary, was an indispensable part of the team. She answered the phone, typed and mailed correspondence, made copies, typed manuscripts, and ran a thousand errands. Her contributions should not be underestimated for without such work the project could not have been completed.

Success of the project can be greatly attributed to work by team

members above and beyond normal duty. It is a success because the members gave not only of their expertise but also of themselves, always with the goal of achieving excellence in their endeavors.

Our research has assembled new data and pointed new directions for investigations. The project does not end here. There will be additional publications resulting from our work. Inquiring minds will continue to look into the Ozark's past.

Although the Scope-of-Work identified three distinct phases of archaeological study to be accomplished during the project, they cannot be totally separated. The Scope-of-Work identified the following sets of activities: Food Plot/Open Field Tract Surveys, Site Testing Historical Archaeological Research, and Collector Studies. Although defined as distinct phases in the Scope-of-Work and outlined as separate phases here, the archaeological activities over-lapped and are integrated into a single project with central research and management goals. Following is a brief description of the archaeological work accomplished during the five years of the project with a summary of the results. Detailed descriptions of the work and results have been presented in the four annual reports as well as in separate documents submitted to the Midwest Archeological Center.

Wildlife Management Food Plots/Open Field Tracts

The principal survey activity outlined in the Scope-of-Work and carried out during the course of the project was the survey of wildlife food plots or open field tracts in the park. According to the Scope-of-Work, there were about 100 tracts regularly cultivated in the park. All of these were to be intensively surveyed immediately after the fields were cultivated and there had been a rainfall to improve visibility. Many of the fields are visited by local collectors, and the surveys were to take place prior to collector visits. Scheduling of the surveys was to be coordinated with park personnel (Scope-of-Work 1981:5-6). The primary purpose of these surveys was to obtain management data. The investigators were to map the distribution of archaeological sites and cultural material density across the tracts and to assess the impacts of cultivation on the sites. At the same time, research concerns were considered. Data were collected to address the research questions outlined in the Technical Proposal (Scope-of-Work 1981:3,5-7).

At the beginning of the project, the investigators were provided with a set of maps on which the food plots/open field tracts were located. Assuming that all of the tracts were regularly cultivated, the First Annual Work Plan (1981:150-152) presented a sampling scheme, based on land form and geographic location, for completing the survey work during the course of the 5-year project. By the end of the first and second years, it was clear that the survey could not proceed as planned. There were at least 193 reported tracts, very few of which are cultivated in any given year, if at all. Conditions and ground surface visibility varied in the tracts: 1) few tracts are cultivated and those

that are include large agricultural fields, row-cropped by permit holders, and small tracts planted by the park as grouse habitat areas; occasionally pastures are cultivated to re-establish grass cover as after a drought; 2) some tracts are periodically burned over and cultivated, then planted as wildlife habitats; 3) many tracts are in permanent pasture or are used for a hay-crop under the permit system; conditions in the pastures and hay fields vary considerably from low and very sparse grass cover to dense fescue stands, sometimes overgrown with weeds and brush; 4) many of the fields are now overgrown with second growth vegetation including saplings, small trees, brambles, briars, buckbrush, and other weeds; in some cases the fields have not been cleared in 10 to 15 years and the vegetation is extremely dense. Ground surface visibility in the cultivated and burned over tracts was excellent to good; in the sparse pastures likewise it was good. In the dense fescue fields and overgrown tracts there was generally no ground surface visibility and shovel testing was hampered by the vegetation. Thus, all the tracts could not be uniformly surveyed.

There was no centralized information in the park on the condition of the tracts. With the exception of the cultivation of the grouse habitat plots in the upper Current, the investigators were not informed of the annual plowing schedules, and information that was received was often in error. The tracts that are row-cropped under the permit system are not all cultivated regularly; cultivation depends on the weather and likely also on the inclination of the permit holder in any particular year. Cultivation to re-seed pastures was done sporadically and no information on this was received (see Price et al 1983:199-201). Finally, local collectors are frequently informed of field cultivation

by the permit holders; since the investigators were not so informed by the park, in every case, the local collectors got to the fields before the investigators could.

In the absence of information on the condition of the tracts, no sampling scheme could be followed. The investigators simply selected areas of the park each year in which survey work would be done and drove to the reported tracts. The areas selected were in all parts of the park to provide even geographic coverage. Those tracts under cultivation were intensively surveyed and mapped as outlined in the Scope-of-Work and the Technical Proposal. Those in low, sparse pasture or other vegetation with reasonable ground surface visibility in at least a part of the tract were surveyed and site information obtained to the extent possible. Those tracts that were densely vegetated and in which no ground surface was exposed were by-passed. Any field roads across any of the tracts, including the densely vegetated ones, were carefully checked for the presence of cultural materials. In some cases, access to various tracts could not be found. Overland routes often crossed private property that was posted with "No trespassing" signs or closed with locked gates. If landowner permission could not be obtained the tracts were not visited.

Table 1-1 presents a summary of the results of the food plot/open field survey. Work was conducted during all five years of the project. Of the 193 reported tracts, 122 or 63% were visited and information on tract condition was obtained from park personnel on 6 additional tracts. Of the tracts visited, 16% were in cultivation, 4% had been recently burned over, and 11% were in low, sparse pasture grass. All of these tracts, comprising approximately 31% of those visited, had good to

moderate ground surface visibility and/or shovel testing could be done with good results. Thirty-two percent of the tracts were in dense fescue cover and 32% were completely overgrown; thus 64% had poor visibility if any at all, and survey work was limited in these. Access to five or 4% of the tracts could not be found. Archaeological sites were found in all but two of the tracts with some surface visibility. Information that could be obtained on the sites varied considerably. In the tracts with good to moderate visibility, site boundaries, variations in the density of cultural materials, and at times presence or absence of features such as middens could be determined. In the densely vegetated tracts, often no more could be determined than simply the presence of a site as indicated by the finding of cultural materials in a road or eroded spot. Despite the problems encountered in the wildlife food plot/open field survey, the work proved extremely productive and did yield good research and management data. The annual reports submitted to the National Park Service-Midwest Archeological Center provide information on the tracts visited during each year of the project, and maps were sent of those tracts intensively surveyed. Under separate cover, the Center has also been provided with a set of tables detailing the location, condition, extent of survey, and archaeological sites recorded in each of the 193 reported tracts.

Other Survey Work

In addition to the food plot/open field surveys, archaeological surveys were done in other areas of the park. At least 25 visitor use areas that had not been previously surveyed were checked for the presence of archaeological sites. These areas included parts of formal,

established camp and picnic grounds as well as informal river access points also used for picnicking and camping, and the yards around 3 cabins and residences. These were surveyed as they were encountered during the attempts to locate the food plots/open field tracts or when the investigators were in the area for other reasons. Information was obtained on site locations and the impacts of various kinds of visitor activities on the sites. Ground surface visibility was often very good in these areas as the ground was frequently eroded from repeated use. Archaeological sites were found in all but five of the areas surveyed.

A sample of landforms not well represented in the food plot/open field tracts were surveyed as time and funds permitted. Information on site locations on a variety of landforms is needed to adequately address research and management concerns. Most of the food plots/open field tracts were on the T-2 and T-3 terraces of the Current and Jacks Fork. A few of the tracts were on the ridge tops on the upper Jacks Fork, but were generally too vegetated to survey effectively. A few were back up small tributaries to the two major streams. Landforms not well represented included ridge tops and bluff edges along the Current River and middle and lower Jacks Fork, and bluff line/talus slope zones with caves, shelters, and overhangs. Four bluff top areas (2 in the upper Current and 2 in the lower Current), 2 bluff-talus areas in the upper Current, and 6 caves or shelters were surveyed. An attempt was made to obtain even geographic coverage in the park. Again, archaeological sites were found in all of the areas surveyed.

Finally, survey work was done as part of the Collector Study and Historical Archaeological Study. This work is described under the description of these two project phases.

Results

When the present project began, 130 sites within the park boundaries had been reported to the Archaeological Survey of Missouri (Table 1-1). During the course of the project, 44 of those were revisited and updated information obtained, and 217 additional sites were recorded (Table 1-2). At the close of the project, 347 archaeological sites are recorded in the park. The Midwest Archeological Center has been provided, under separate cover, a set of USGS quadrangle maps showing the site locations, a set of tables with summary information for each site, and a set of USGS quadrangle maps showing survey coverage in the park.

Table 1-1. Wildlife Management/Open Field Tracts

Park Area	No.Reported Tracts	No. Tracts Visited	Condition of Tracts Visited: Cultivated	Burned	Low Pasture	Dense Fescue/ Hay	Overgrown	No Acess	No. Arch. Sites Record
Upper Jacks Fork	22	14	1	0	0	5	6	2	6
Alley Spring Area	22	15	4	0	0	8	3	0	17
Lower Jacks Fork[1]	6	3	1	0	0	0	2	0	4
Upper Current (Montauk-Round Spring)	42	29	7[2]	0	3	11[2]	8[2]	0	42
Middle Current[1] (Round Spring - Log Yard)	48	20[3]	3[3]	4	5	1	7[3]	0	44
Middle Current (Log Yard - Gooseneck)	53	41	4	1	6	14	13	3	45
Totals	193	122	20	5	14	39	39	5	158

[1] one tract surveyed by NPS-MWAC, site recorded, in addition to those visited during this project

[2] small area in one tract cultivated

[3] in addition to tracts visited, 6 reported by Riverways Personnel as overgrown and 1 cultivated

Table 1-2. Archaeological Sites in Ozark National Scenic Riverways

County	No. Reported Previously [1]	No. Reported during the Project	No. of Previously Reported Sites Re-visited	Total No. Sites
Texas	1	0	1	1
Dent	8	14	4	22
Shannon	88	143	34	231
Carter	60	60	5	93
Totals	130	217	44	347

[1] reported to Archaeological Survey of Missouri

ARCHAEOLOGICAL SITE TESTING

The Scope-of-Work called for the testing of a sample of sites to determine their research potential and eligibility for listing in the National Register of Historic Places. A sample of the sites in the wildlife food plots/open field tracts and of the historic sites was to be included in the testing phase. The number of sites tested was dependent on funding levels throughout the project. The sites were selected for testing on the basis of management, interpretive, and research concerns. Five prehistoric and five historic (all with prehistoric components also) sites were tested during 1983, 1984, and 1985. The prehistoric site testing focused primarily on sites with Developmental Mississippian occupations; the development of the Mississippian cultural expression was a primary research question outlined in the Technical Proposal (1981:13-16). The presence of a number of these sites in the park offered an excellent opportunity to address the question which is receiving increasing attention among archaeologists working in the Mississippi Valley and peripheral regions. One site which seemed to have a good Middle Archaic component was also selected. As noted in the Technical Proposal (Revised Offer 1981:1), little is currently known about this cultural stage. These prehistoric sites chosen for testing included two which are under regular cultivation and subjected to heavy collector pressure; one cave to assess the nature and preservation of archaeological deposits in and prehistoric use of shelters and caves; and two sites in pasture under sporadic cultivation. According to the Scope-of-Work and the Technical Proposal, a sample of different kinds of historic period sites were to be tested to obtain information on the research potential and information which

could be used in park interpretive programs. Testing again focused on one of the primary research objectives, understanding nineteenth century frontier adaptations in the region (Technical Proposal 1981:37-40). The sites included: a county seat settlement to obtain data on cultural organization and its variation in the Current River/Jacks Fork valleys; a reported plantation and a farmstead to obtain information on agricultural modes and economic systems in the region; an early sawmill associated with the poorly understood early frontier extractive industry; and a habitation dating to the period of earliest settlement, a period for which no archaeological data are available (Technical Proposal 1981:33-37, 43-45). The sample of sites included one in a wooded setting away from repeated visitor activities but important in local history and of potential value in interpretive programs; one under regular cultivation and one under sporadic cultivation; one in pasture; and one partially wooded and partially cultivated in the past.

The excavations at both the prehistoric and historic sites were accomplished in cooperation with outside institutions and other park programs. In 1983 the University of Nebraska summer field school in archaeology was held in the park with Dr. Mark Lynott and Susan Monk of the Midwest Archeological Center and James Price and Cynthia Price as instructors; four sites were tested. Ozark National Scenic Riverways, through the Volunteers in Parks (VIP) program, provided local individuals for the testing during 1984 and 1985. In 1985, students in the Geology field school, under the direction of Dr. Dave Castillon, Southwest Missouri State University, assisted for several days.

Following is a brief summary of the sites and the results. Detailed reports of the excavations, research designs, justification for

selecting the sites for testing, and analysis of the materials are presented in the annual reports submitted to the National Park Service-Midwest Archeological Center. Reports on two of the site excavations have appeared in professional publications as well (C. Price 1984:8-11,16-18; Lynott, Monk, and Price 1984:12-14,20).

Prehistoric Sites

23SH-10, Owls Bend Site

The Owls Bend site is located in one of the large agricultural fields cultivated under the permit system and is frequented by local collectors. The site was first reported a number of years ago and saw limited testing by the University of Missouri in 1968 (Williams 1968). It is multi-component with a Developmental Mississippian midden in one part of the site. During this project, testing was done in the Mississippian midden. One burial and several sub-surface refuse pits were excavated, and a quantity of well preserved floral and faunal remains were recovered.

23SH-141, Mouth of Rocky Site

This site was located during survey work the first year of this project and is in pasture in one of the open field tracts. It contains a single Developmental Mississippian component. Test units were excavated to the base of the cultural deposit and a sample of the cultural material recovered. No sub-surface features were encountered.

23SH-14/55, Culpepper Site, Sub-area A

The Culpepper site is an extensive multi-component site in one of the fields row-cropped under the permit system. It was reported a number of years ago and is well known to local collectors. Local

collectors have a quantity of Middle Archaic points from a part of the site which survey work suggested may contain a midden. Test units were placed in this area. No sub-surface features were encountered; the midden had no depth but is a sheet refuse deposit entirely in the plowzone; no diagnostic Middle Archaic materials were recovered.

23CT-36, Granite Quarry Cave

Granite Quarry cave was first reported and tested by a local amateur during the 1940s (Lowe n.d.). It contains two relatively undisturbed archaeological components with some depth. The deepest is a Late Archaic midden sealed by roof fall. A Developmental Mississippian component lies just beneath the topsoil. A part of the Archaic midden and several Mississippian hearths were excavated. A quantity of well preserved floral and faunal remains were recovered as were several C-14 samples.

23SH-11, Shawnee Site

The site was first reported a number of years ago and was visited during this project when the open field tract was cultivated for pasture re-seeding. What appeared to be Mississippian features were noted. When tested the site was in dense fescue. A part of a Developmental Mississippian wall-trench house was uncovered with burned floor, hearth, and structural members intact just below the plowzone. Samples for thermoluminescence and C-14 dating were recovered. Following the testing, the Midwest Archeological Center conducted a magnetometer survey of part of the site and re-excavated a part of the burned hearth to obtain samples for archaeomagnetic dating.

Historic Period Sites

23SH-104, Old Eminence

Old Eminence was the first county seat of Shannon County, ca. 1840s-1860s. The site is in a wooded setting and has never been plowed. The archaeological remains were located and limited testing conducted under a purchase order with the Midwest Archeological Center by Cynthia and James Price in 1980 (c. Price 1981a). The Midwest Archeological Center conducted a magnetometer survey of the site prior to testing during this project. During testing here, the jail, courthouse, and a nearby midden were tested as were anamolies defined by the magnetometer survey. The site is remarkably well preserved; charred structural elements, as floor planking and support sills, were found in place in the building remains. The excavations allowed a better definition of site function; the site can best be described as an isolated political center rather than a "town."

23CT-111, Isaac Kelley Site

The Isaac Kelley Site was reported in the literature and located and tested again under purchase order by Cynthia and James Price in 1981 (C. Price 1981b). The Midwest Archeological Center also completed a magnetometer survey here prior to the testing during this project. The site is in an open field tract, previously cultivated and now in permanent pasture. It was reported in the literature as an early to mid-nineteenth century plantation. Test units were excavated to the base of the plowzone. Only one small historic period feature was encountered, although a sub-plowzone Mississippian house was found. Through analysis of the distribution of historic period materials across the site, the

dwelling and a second structure loci were defined. It was not clear whether the site is a plantation or simply a large farmstead.

23SH-14/55, Culpepper Site, Sub-area B

The site lies in a large agricultural field row-cropped under the permit system. It is shown as a farmstead on a General Land Office Survey Plat, ca. 1840. A part of a sub-plowzone "celler" pit, under or adjacent to a dwelling, was excavated. The pit contained numerous artifacts, including large sections of ceramic vessels, and well preserved faunal remains.

23CT-235, Phillips Bay Mill

The site was reported in documentary records, but a specific location could not be determined. It was found during a visit to an overgrown open field tract to check on a prehistoric site reported by a local collector. The site includes the remains of an early to mid-nineteenth century sawmill, with relatively undisturbed above ground features in the woods along the edge of the old field and an associated habitation in the old field. A part of a deep, sub-plowzone, pit-like feature of uncertain function in the habitation area was excavated. Normally perishable items, such as unburned wooden planks and a paper wrapper enclosing a medicinal (?) substance, were preserved in the feature. Analysis of the materials suggests the possibility that the habitation was that of slaves or blacks.

23SH-157, Fanchier Site

The site was not found reported in the literature but was discovered during the survey of one of the open field tracts which is under periodic cultivation by the Missouri Department of Conservation. It is

the earliest historic period archaeological site found in the park to date. Occupation probably began during the early nineteenth century and ended ca. 1830 or before. A large part of the plowzone was stripped by hand during testing, but no cultural features were found. Cultural materials were exceptionally sparse, suggesting possible inaccessability to goods during the period of early settlement.

As a result of the testing program, four of the historic period sites were nominated to the National Register of Historic Places: Old Eminence, Isaac Kelley, Culpepper, and Phillips Bay Mill. The prehistoric sites nominated include: Shawnee Creek and Owls Bend.

HISTORICAL ARCHAEOLOGICAL STUDY

The Scope-of-Work (1981:4) identified three levels of study for this phase of the project: 1) archival research to identify potential site locations in the park; 2) survey to locate and verify the presence of a sample of sites reported in the literature; and 3) site testing to assess research potential and eligibility for listing in the National Register of Historic Places.

Table 1-3 lists the repositories visited during the course of the project and the materials found in each that are relevant to this project. The work was done during the first and third years of study. The annual reports submitted to the Midwest Archeological Center detailed the findings at each institution visited. All of the repositories listed in the Technical Proposal (1981:100-107) were visited with one exception. The National Archives and Records Service, Kansas City, was not visited. Because very few actual site locations were obtained in the documents found in all of the other repositories visited, it was thought that available funds could be more productively spent in other project activities (Fifth Annual Work Plan 1985:8-10). In addition to visiting state and local record repositories, the following documents were obtained by loan and/or purchase: copies of all of the General Land Office Survey plats, c. 1840s-1860s, for the Riverways; copies of the available pre-1950s USGS 15' quadrangle maps for the area; all available published local and regional histories, genealogical works, and descriptive texts for the Current and Jacks Fork areas; selected geological reference works dating to the nineteenth and twentieth centuries; copies of all Federal Census Records for the Riverways counties including population, agricultural, slave, and products of

industry schedules. Information on sites was also obtained from local artifact collectors during the collector studies and from local residents.

Generally, historical information relevant to the Current River and Jacks Fork region was found at all of the repositories visited, but specific site locational information was less easily found. The most productive site locational data came from local histories, both published and unpublished. Information was sought on all classes of sites except farmsteads dating later than the late nineteenth century; these sites were, however, recorded as archaeological sites when encountered in the field. Over 250 reported site locations were found in the literature. Under separate cover, the Midwest Archeological Center was provided with a set of tables identifying the sites and reference sources and with a set of USGS quadrangle maps showing the reported site locations.

Survey work was done to locate archaeologically a selection of the sites reported in the literature. The sample was chosen to include a variety of the kinds of sites reported and to maintain even geographic coverage in the park. Much of the actual field work was combined with the food plot/open field tract surveys, since most of the reported site locations were in these tracts. A few sites outside these tracts were also specifically searched for. As noted in the discussion of archaeological survey work in the park (ARCHAEOLOGICAL SURVEY, above), selected areas outside of wildlife food plots/open field tracts were surveyed as funding permitted. These areas included non-valley landforms, particularly bluff tops and bluff-talus zones, to provide a better sample for site locational studies. A number of historic period

sites were found in these zones. Table 1-4 presents information on the number of sites reported in the literature that were found archaeologically. A total of 40 sites were identified in the field. Emphasis was placed on searching for the earlier sites and for those kinds of sites for which little archaeological information is available (Technical Proposal 1918:114-117). Archaeological evidence could not be found for a number of sites including several mid-nineteenth century farms, cemeteries, a mill, an early tannery, and early nineteenth century Indian settlements (Table 1-5). The reported locations for most of these latter sites were densely vegetated, and survey work was ineffective in these areas. The survey work also located an additional 40 historic period archaeological sites not reported in the literature, including cemeteries, early to mid-nineteenth century settlements, late nineteenth-twentieth century houseplaces and farmsteads, roads, and a nineteenth century blacksmith shop. When the project began, there were 24 historic period archaeological sites on record in the park and 36 historic/architectural sites and 19 cemeteries listed with the Ozark National Scenic Riverways. During the project, 82 additional historic period archaeological sites were recorded.

Sites were mapped as found and detailed maps of those with above ground cultural features were made. Measured drawings of standing structures were also made. Cemeteries were recorded on forms designed for that purpose, and individual graves were mapped and recorded at selected sites. All sites were reported to the Archaeological Survey of Missouri.

The sites that were tested were chosen to include a representative sample of the kinds of sites in the park; the number of sites tested was dependent on funding levels during the project. Five sites were tested including a pre-1830 habitation (Fanchier Site), a mid-nineteenth century farmstead (Culpepper Site), a reported early to mid-nineteenth century plantation (Isaac Kelley Site) a mid-nineteenth century county seat settlement (Old Eminence), and an early nineteenth century sawmill (Phillips Bay Mill). This testing is described above, SITE TESTING. Four of the sites were nominated to the National Register of Historic Places: Old Eminence, Isaac Kelley, Culpepper, and Phillips Bay Mill. In addition, one of the sites recorded during survey work was also nominated, the Susie Nichols Cabin Site, a late nineteenth-twentieth century farmstead with standing structures.

Table 1-3. Repositories visited during the project.

Repository	Materials Available
Crawford County Courthouse, Steelville	Deed records beginning in 1832 Marriage records beginning in 1831 County court records beginning in 1835
Washington County Courthouse, Potosi	Deed records beginning in 1814 Circuit Court records beginning in 1814 County Court records beginning in 1822
Ripley County Courthouse, Doniphan	Deed records beginning in 1830s Marriage records beginning in 1833 Land Patent records beginning ca. 1820s County Court records beginning in 1853
Texas County Courthouse, Houston	Deed records beginning in 1845 Marriage records beginning 1855 County Court records beginning in 1845
Shannon County Courthouse, Eminence (Records post-date 1860s)	Deed records beginning ca. late 1860s-1870s Surveyor's records beginning in 1870s
Dent County Courthouse, Salem (records post-date 1860s)	Deed records beginning in 1860s Land Patent records beginning ca. 1850s Marriage records beginning ca. 1870s Circuit Court records beginning ca. 1860s Tax records beginning in 1866/67 County Court records beginning in 1866
Current River Regional Library, Doniphan	Copies of unreferenced maps of Missouri, probably obtained from the National Archives; Ripley County Post Office listings
Doniphan Public Library, Doniphan	Records of the War of the Rebellion (U.S. War Department); no material on local history

Texas County Public Library, Houston	Typed manuscript reports on local history; file with miscellaneous clippings of local interest
Eminence Public Library	No unpublished materials of local interest
Salem Public Library	No unpublished materials of local interest
Ozark National Scenic Riverways, Headquarters, Van Buren	Historic structure survey reports Oral history tape transcripts Historic photographs
Missouri Historical Society, St. Louis	Graham papers, 1820s, historic Indicus Hume collection Weydemeyer LeHer Book, 1862 LeSieur and Chouteau collections - historic Indian Deatherage Store Account Books, 1856 Papers of the Current River Fishing and Hunting Club, 1888 Promotional Booklets, Shannon County Map collection Photograph collection
State Historical Society of Missouri, Columbia, Missouri	Newspaper files, Reed LeHer, 1850s Pike Creek Store, Account Books, ca. 1830-1870 Documents from Missouri Lumber and Mining Company, ca. 1880s-1910s Published county histories
U.S. Forest Service - Mark Twain National Forest, Rolla, Missouri	Copies of maps Trip record, ca. 1935, Current River General area information - Current River
Ellis Library, University of Missouri, Columbia	Laws of Missouri, Records of the Missouri General Assembly Published county and regional histories Published Missouri Gazeteers Published 19th Century journals and diaries

Table 1-4. Reported sites located archaeologically.

Site Nature	No. Located
Early-mid-19C sawmills	2
Late 19C-20C grist sawmills	7
Early-mid-19C farmsteads	4
Late 19C-20C farmsteads	4
Cemeteries	13
Railroads	1
Trams	1
Logging Camps	1
Rural Schools	3
Early 20C resorts	2
Towns	1
Roads	1
Total	40

Table 1-5. Reported sites searched for but not found.

Site nature	No.
Early-mid 19C farmstead	3
Historic Indian settlement	1
Cemeteries	2
Isolated graves	1
19C mill	1
Tannery-Distillery	1
Total	9

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PRIVATE ARTIFACT COLLECTIONS STUDY

An integral part of the research project was a study of private artifact collections from Ozark National Scenic Riverways and immediately adjacent areas. Many of these specimens were collected prior to the establishment of Ozark National Scenic Riverways by the National Park Service. Local amateur archaeologists and collectors were most cooperative in permitting examination and photography of their collections. Data obtained in this manner complemented the overall study in many ways. Principally it provided locational information on sites that had not been previously recorded by professional archaeologists and filed with the Archaeological Survey of Missouri. A major contribution of the study was determination of the cultural affiliation of sites through a study of artifacts they had yielded. Many of the sites from which specimens had been collected which were in agricultural fields three decades ago are now overgrown with vegetation making it impossible for a current survey to locate and collect surface specimens. The content of private collections played a major role in the selection of sites to be test excavated. Surface collections provided important information on the number and nature of components represented on sites.

During the first year 7 private collections were photographed, totaling 3,297 artifacts documented on film. A single large collection containing 5,106 specimens was photographed the second year and during the third year 1,243 specimens from a single collection were photographically documented. Yet another collection was photographed as part of the fourth year's research activities. It contained 542 specimens.

During the course of the study 10 private collections were photographed containing specimens totaling 10,188.

Many of the specimens in the collections came from sites in the region but outside the bounds of Ozark National Scenic Riverways. These data complement those from within the park and represents a well-rounded picture of the kinds and quantities of prehistoric artifacts present in the Current and Jacks Fork drainages.

The study proved to be most helpful in our research and is highly recommended for similar research projects. Fortunately, the largest collections studied were almost totally provenienced, allowing us to attribute artifacts to specific sites on the landscape.

The study also allowed us to make recommendations to the Park Service concerning management of cultural resources. Unauthorized collecting of archaeological specimens within the park continues to be a problem. Most serious amateur archaeologists in the region are cognizant of pertinent regulations and have ceased their collecting activities on federal lands. Many sites are still heavily collected by tourists and local people with an interest in Indian artifacts. In fact, try as we might, we were never able in 5 years to retrieve a collection of diagnostic specimens from the Culpepper site, 23SH14/55 prior to it having been totally walked over by collectors. In almost every cultivated field we were greeted by footprints of collectors. This is a serious problem which can best be solved through public education on the subject of cultural resources management and the removal of significant sites from cultivation.

An extensive set of catalog cards bearing photographs of specimens from private collections was prepared for the National Park Service as

part of this study. A duplicate set of cards is on file with the University of Missouri, American Archaeology Division, Southeast Missouri Archaeological Research Center, Naylor, Missouri.

SECTION II

PREHISTORIC PERIOD ARCHAEOLOGY

James E. Price

INTRODUCTION

The Scope-of-Work (1981) for the investigation of the prehistoric cultures of the Current and Jacks Fork drainages centered on topical regional research concerns directed toward a study of changing land use patterns through time and the cultural relationships of prehistoric peoples in the southeastern Missouri Ozarks to those in adjacent areas such as the Mississippi Alluvial Valley. The Technical Proposal (1981: 10-25) outlined a number of research problems that might be addressed during the course of the 5-year research program in Ozark National Scenic Riverways. They are:

1. Protohistoric Utilization of the Current River Valley
2. Extent of the Powers Phase or Middle Period Mississippian Occupation in the Current and Jacks Fork Valleys
3. Development of the Mississippian Lifeway in the Current and Jacks Forks Valleys
4. Woodland Culture Areas in the Current and Jacks Fork Valleys
5. Late Archaic Period in the Current and Jacks Fork Valleys
6. Documentation of Paleo-Indian in the Current and Jacks Fork Valleys
7. Cultural Isolation vs. Outside Communication in the Prehistory of the Ozarks

While these were expressed research concerns, they were not intended by the investigators to be exhaustive of all such concerns that could be addressed during the course of the research. The research design operationalized during the project was directed toward generation of data from several sources in order to address the research problems in an informed manner. Data were sought from pedestrian field surveys in order to locate previously unrecorded prehistoric sites, reassess

previously recorded sites, and recover samples of cultural materials from sites visited. Data were also generated through an examination and photographic documentation of private prehistoric artifact collections under the possession of numerous individuals throughout the region in order to obtain locational information on prehistoric sites within Ozark National Scenic Riverways as well as determine cultural affiliation of the many sites represented by artifacts in the private collections. Both pedestrian survey and study of private artifacts collections generated data on settlement patterns throughout the prehistoric past.

A third set of data was collected through a site testing program which involved limited excavation on several sites for the purpose of defining prehistoric cultures once occupying the region through identification of diagnostic material culture assemblages, refinement of the prehistoric cultural sequence through the excavation of stratified sites, the recovery of materials for chronometric dating of the prehistoric cultures, and the recovery of faunal and floral remains for elucidation of past subsistence strategies.

RESEARCH PROBLEMS AND RESULTS

As noted above, 7 prehistoric archaeology problem domains were defined at the onset of the 5-year research project. Through all facets of the research, ranging from studies of private collections to field survey and site testing, data were generated for the expressed purpose of solving these problems. The following is a brief summary of the problem domains and the contribution of the research project to each domain.

Protohistoric Utilization of the Current and Jacks Fork Valleys:

After extensive examination of 10 private collections from the region it can be firmly stated that the region witnessed limited use by late prehistoric/protohistoric peoples, probably ca. A.D. 1500-1650. Several collections contained thin triangular or willowleaf arrowpoints diagnostic of this late time period. Additional evidence is present in one pottery sherd from a cave, a fin off of a fish effigy, that appears to be like those made by protohistoric peoples in southeast Missouri. Apparently the Current and Jacks Fork drainages were utilized, perhaps on a limited basis as a hunting territory, by protohistoric populations, most likely peoples of the Armorel phase who occupied the area which is now the extreme southeastern tip of southeast Missouri and a portion of northeast Arkansas. No new sites of this time period were discovered during the course of the pedestrian survey which yielded evidence of protohistoric occupation.

Extent of the Powers Phase or Middle Period Mississippian in the Current and Jacks Fork Valleys:

Site testing, examination of private artifact collections, and extensive pedestrian survey failed to yield any major evidence for the presence of Mississippian peoples in the middle and upper Current River Valley ca. A.D. 1275-1400, the period when Mississippian culture flourished in the Central Mississippi Alluvial Valley. Excavations on several sites yielding shelltempered ceramics failed to produce any specimens diagnostic of the Powers phase which was prevalent in the lower Current River Valley ca. A.D. 1275-1400. A few strap handles from shelltempered jars are known in private collections which may evidence

minimal presence of Middle Period Mississippian in the middle and upper Current River Valley. Also, several Mill Creek chert hoes have been recovered from the valley which might date from that time when trade in this material was very pronounced, but most likely date from earlier Emergent Mississippian times. Granite Quarry Cave yielded jar, bottle, and bow sherds similar to Powers phase specimens chronometrically dated to the 13th century A.D. These probably represent immediate antecedents to the Powers phase.

Development of the Mississippian Lifeway in the Current and Jacks Fork Valleys:

The most significant contribution in prehistoric archaeology made by the 5-year study involved this research domain. Pedestrian survey, private artifact collections studies, and site testing yielded abundant data on Late Woodland/Emergent Mississippian cultures that occupied the study area ca. A.D. 600-1000. The project contributed greatly toward definition of at least 2 Emergent Mississippian archaeological phases in the region, the Naylor phase, typified by the Gooseneck and Mouth of Rocky sites, and the Owls Bend phase exemplified by the Owls Bend site. The Naylor phase assemblage contains shelltempered ceramics usually occurring in a globular jar form which has no appendages, characteristic outflaring rims, and sometimes a red slip on the interior surface. The Owls Bend phase produces a ceramic assemblage consisting of shell-tempered cannister-shaped vessels with flat bases. Exteriors of these vessels are sometimes simplestamped and occasionally checkstamped. The lithic assemblages associated with these 2 phases, consisting of small cornernotched arrowpoints, drills, cores and other artifacts, appear to

be identical or at least quite similar.

Abundant evidence of Emergent Mississippian cultures occur in private collections in the form of the diagnostic small arrowpoints which are ubiquitous in the study area.

Our research has demonstrated that between A.D. 600 and 1000 cultures in the rugged southeastern Ozarks were in the mainstream of Mississippian emergence. Shelltempered ceramic technology was in place very early in the region, before it began either at Cahokia or in the Cairo Lowland, the areas traditionally thought to be the homeland of Mississippian culture. It definitely appears that peoples of the study area participated fully in the formative processes of Mississippian culture and more or less abandoned the region after ca. A.D. 1200 at the time the large nucleated settlements began to develop and expand in the Central Mississippi Alluvial Valley. During the 12th century A.D. Mississippian occupation was present in the study area as evidenced by a walltrench, lowered-floor structure discovered on the Shawnee Creed site on the Jacks Fork River.

Discoveries made in Ozark National Scenic Riverways have forced archaeologists to rethink the prime movers that generated Mississippian culture. The peoples occupying the rugged southeastern Ozarks participated equally in Mississippian emergence at the same time, or perhaps before, those cultures in the Central Mississippi Alluvial Valley.

Woodland Culture Areas in the Current and Jacks Fork Valleys:

Research in the study area helped delineate culture areas from ca. the time of Christ until ca. A.D. 600. There is only a small amount of evidence for Early Woodland occupation in the region. This occurs in the form of a few sandtempered sherds from the Current and

Jacks Fork drainages. Most likely these are Tchula ceramics similar to Pascola wares of the Central Mississippi Alluvial Valley. Middle and Late Woodland is represented in the Upper Current River drainage, as well as the entire Jacks Fork drainage, approximately from Owls Bend upstream, by limestone tempered ceramics Maramec Spring ceramics. Below that point limestone tempered ceramics essentially do not occur. Late woodland is represented in the middle and lower Current River drainage by shelltempered ceramics. In the vicinity where the boundary existed between shelltempered and limestone tempered wares, both kinds of ceramics occur on some sites and individual sherds containing both shell and limestone tempering agents are found. Apparently Woodland cultures were at least technologically different in the 2 areas. Those peoples upstream manufactured limestone tempered ceramics and belonged to the Maramec Spring phase. Several stone burial cairns along the upper Current in the vicinity of Pulltite and Akers are attributed to these Woodland peoples. Downstream from the Owls Bend locale there is no evidence for such cultures either in the form of limestone tempered ceramics or stone burial cairns. This area has yielded evidence of Late Woodland cultures who manufactured shelltempered ceramics.

Late Archaic Period in the Current and Jacks Fork Valleys:

The project generated abundant data concerning this research problem domain, mostly from examination of private collections and through pedestrian survey. An overwhelming majority of the sites recorded in the study area have a Late Archaic component and all the private collections examined contained numerous large stemmed and cornernotched projectile point/knife specimens diagnostic of the Late

Archaic substage. Many such specimens are made of orthoquartzite or rhyolite, materials extensively used in the southeastern Ozarks during this substage. While most sites tested during the course of the project yielded Late Archaic materials, only 1, Granite Quarry Cave, revealed a component in stratigraphic context. Apparently Late Archaic populations were fairly numerous in the study area since almost every terrace along the major streams produces specimens dating from this substage.

Documentation of Paleo-Indian in the Current and Jacks Fork Valleys:

After 5 years of intensive research in the study area it can be stated that there is very little evidence of Paleo-Indian occupation there. Only a single classic Clovis point was documented. Other points with concave bases and minor fluting are present but also in very small numbers. The investigators are confident that if there had been significant Paleo-Indian occupation in the region, private collections obtained when much of the valleys in the study area were under cultivation would contain numerous specimens. Based on the current data base it appears the Paleo-Indian occupation in the study area was essentially nonexistent.

Cultural Isolation vs. Outside Communication in the Prehistory of the Ozarks:

The Ozark dome cannot be considered a single culture area. Streams which dissected the dome margins creating rugged hill country became corridors for the movement of peoples and their ideas. Prehistoric peoples of the Ozarks received cultural influences and in turn influenced adjacent populations but most such influences were along the major valleys which drained the dome and not across the dome from one

side to the other. Such influences changed from time to time in the past, varying in intensity. For example, during the Woodland and Mississippian stages the southern and western Ozarks were influenced by Caddoan cultures and their predecessors. The northern and northeastern area was influenced by cultures of the American Bottom near present day St. Louis. The southeastern area, in which Ozark National Scenic Riverways lies, shared cultural affinities with prehistoric cultures of the lowlands of southeast Missouri. Thus, the Ozark dome appears to not have been a single culture area but many culture areas related to culture outside and on the periphery of the Ozarks.

The Current River Valley empties into the Western Lowland of the Mississippi Valley and prehistoric occupants of both the Ozarks and the Lowland shared many cultural attributes in common. Through the millenia prehistoric populations passed through the same cultural stages in both areas. Subsistence patterns and technologies were parallel and similar in both regions during most of the prehistoric past.

Evidence from our research in Ozark National Scenic Riverways indicates that during the Archaic and Woodland stages the Ozarks remained somewhat isolated from influences from populations other than those from the lowlands of southeast Missouri. Almost no Hopewell influence entered the region. However, the reverse is true during the Emergent Mississippi substage when peoples of the Current River Valley shared equally in the rapid socio-political, subsistence, and technological changes that were taking place in the Central Mississippi Valley.

During the prehistoric past there was not a great amount of trade materials entering the Current River Valley from outside the region that

can be detected in the archaeological record. Although foreign and exotic materials such as Fort Payne and Mill Creek cherts were traded into the region, they occur in small quantities. More materials were probably traded out of the Ozarks than into it. It is highly likely that most hematite, galena, rhyolite, and basalt materials found on Mississippi Valley sites of southeast Missouri and northeast Arkansas had their origins in the Ozarks.

THE ARCHAEOLOGICAL SITES AND RESEARCH RESULTS

INTRODUCTION

During the course of the 5-year research project in Ozark National Scenic Riverways the Southwest Missouri State University Center for Archaeological Research conducted test excavations on 9 sites containing prehistoric components. Six of these sites were selected for archaeological testing in order to pursue research objectives outlined in the proposal submitted to the National Park Service prior to the initiation of the project. The additional 3 were a consequence of testing historic components as part of the study of the historic past in Ozark National Scenic Riverways.

SUMMARY OF EACH SITE TESTED

Mouth of Rocky Site, 23SH141 (J. Price 1984: 194-225)

This site was tested with field crew from the University of Nebraska participating in a field school. It was selected for testing because preliminary pedestrian field investigations indicated it would likely yield significant data on Emergent Mississippian in the Current River Valley. Nine 1 x 1-meter units were excavated in archaeological deposits on the site yielding a sample of lithic and ceramic cultural materials in sufficient quantity to demonstrate that the site probably has only a single component dating from the Emergent Mississippi substage representing the Naylor phase in the Ozark Highland. The site yielded artifacts of this subsurface from the surface to a depth of 80 cm. No features were encountered. Vertical and horizontal distribution of subsurface artifacts and debitage on the site suggested that

the occupation took place on a terrace that was growing through alluvial acretion both vertically and horizontally toward the river during a relatively short span of time. The site yielded small arrowpoints, shelltempered ceramics, small chert cores, perforators, and a green granite axe or cert fragment. It also produced an abundance of debitage and firecracked rhyolite. A few limestone tempered Maramec Spring sherds were recovered. The site assemblage appears to be more closely affiliated with that of the Gooseneck site, 23CT54, many miles downstream on the Current River, than to that of the Owls Bend site, 23SH10, a short distance upstream. Two thermoluminescence dates from the site suggest that it was occupied in the late 8th and early 9th centuries A.D.

Owls Bend Site, 23SH10 (Lynott, Monk, & J. Price 1984:12-15)

This site was also tested with a field crew from the University of Nebraska field school. It was selected for testing because preliminary investigation had indicated that it contained materials that spanned the Woodland and Mississippi stages. It was anticipated that the site would contribute to a better understanding of the emergence of Mississippian culture in the eastern Ozarks. The site consists of a dark midden containing an abundance of firecracked rhyolite on a high terrace overlooking the Current River. A total of 24.75 square meters were excavated on the site. Eight features and 1 human burial were encountered. Most of the features were pits yielding considerable quantities of animal bones, macrobotanical remains, ceramics, and chipped stone artifacts as well as large quantities of firecracked rhyolite. The human burial had been placed in a pit in a loosely flexed position with the head oriented to the northwest. A tortoise

shell accompanied the burial. Artifacts recovered from the site include small arrowpoints, arrowpoint preforms, perforators bifaces, and retouched pieces. Groundstone tools recovered were sandstone and quartzite manos and axe or celt fragments of green granite. Ceramics recovered are for the most part shelltempered but a few limestone tempered sherds were found. Sherds indicate the vessels had flat bottoms and slightly inverted to slightly everted rims. No handles or other appendages were recovered. Most sherds are plain but some exhibit simplestamping or checkstamping. Limestone tempered Maramec Spring wares sometimes have cordmarking on them. Five C-14 dates were submitted for dating the Owls Bend occupation. They range (uncorrected) from A.D. 580 +/- 90 to A.D. 1020 +/- 60. The lithic assemblage recovered from the site appears to differ very little from Naylor phase components of the Varney ceramic tradition but the ceramics are quite contrastive. Both belong to the Emergent Mississippi substage and reflect the variety in shelltempered vessel morphology during formative years of the Mississippian emergence ca. A.D. 700-1000.

Isaac Kelley Site, 23CT111 (C. Price 1984a: 91-93)

Prehistoric cultural materials were recovered from this site as a consequence of that test excavation of an historic component by the investigators assisted by the University of Nebraska field school. The prehistoric occupation spanned the period from the Archaic stage to the Mississippi stage. Five cornernotched or stemmed projectile points/ knives were recovered from the site, probably Late Archaic in origin. Surface collections from the site prior to the investigations contained small arrowpoints; and during the course of the test excavations

numerous small shelltempered sherds were recovered indicating the presence of a Mississippian component. A large prehistoric feature, Feature 1, encountered during the testing, appeared to be the substructure basin for a lowered-floor Mississippian structure. A small test excavation in this feature indicates it reaches a depth of 80 cm. below the present ground surface. A small postmold was encountered in the bottom of the structure basin. The basin fill yielded shelltempered sherds, chert flakes, and small charcoal fragments. Although the entire feature was not stripped of overlying plowzone, a sufficient area was exposed to reveal that the feature is either square or rectangular. Its orientation is similar to Mississippian structure basins throughout the Powers Phase sites in the Western Lowland near the Ozark Border southeast of Ozark National Scenic Riverways. No chronometric dates were obtained for the Mississippian feature on 23CT111; it probably dates ca. A.D. 1000-1200.

Old Eminence, 23SH104 (C. Price 1984b: 156-160)

As a consequence of conducting test excavations on the historic site of Old Eminence in June, 1983, a quantity of prehistoric cultural materials were recovered. Although 1,785 pieces of cultural materials were discovered, only 3 were considered diagnostic. Two were corner-notched projectile points/knives and 1 was a shallow sidenotched point, all probably dating to the Late Archaic or Early Woodland substages.

Culpepper Site 23SH14/55A (J. Price 1985a: 144-161)

Excavations were conducted at this site for the purpose of locating buried archaeological deposits dating from the Middle Archaic substage. Surface collections from the site yielded several diagnostic

specimens dating from this time and the site surface exhibited dark midden staining. Three 1 x 1-meter test units were excavated on the site to culturally sterile subsoil. The plowzone contained a great abundance of firecracked rock but few diagnostic specimens. The midden staining was restricted to the plowzone only and no buried deposits were encountered. Several diagnostic specimens were recoverd from the surface of the midden which included 2 small Emergent Mississippian arrowpoints and 2 Late Archaic orthoquartzite projectile points/knives. Diagnostic specimens recovered from the plowzone of the excavations include a contracting stemmed Early Woodland projectile point/knife, 2 small Emergent Mississippian arrowpoints, and an arrowpoint preform. It is concluded that the portion of the site tested contains evidence of Late Archaic, Early to Middle Woodland, and Emergent Mississippian occupations.

Culpepper Site, 23SH14/55B (J. Price 1985b: 162-169)

In conjunction with the excavation of an historic pioneer period celler pit and other test excavations in June, 1984, on part B of the Culpepper site a quantity of prehistoric cultural materials was recovered. Numerous bifacial artifacts were recovered, including 4 small arrowpoints representative of the Emergent Mississippi substage in the region. Two small shelltempered pottery sherds probably coeval with the arrowpoints were also recovered. Two contracting stemmed projectile point/knives were also recovered, probably representing an Early Woodland occupation on the site. A single sandtempered pottery sherd probably coeval with these points was also recovered. The balance of the projectile points/knives recovered from the site are stemmed and cornernotched with the exception of a shallow sidenotched specimen.

Most of these probably date from Late Archaic through Late Woodland substages. Two fragments of flaked chert perforators/drills were also recovered. A large sandstone mortar was found in the bottom of the historic cellar pit, apparently placed there by the Euro-American inhabitants of the site. Excavations yielded no prehistoric subsurface features. In summary, the site content is quite similar to the prehistoric occupations represented on part A. Namely, occupation is represented from Late Archaic through Emergent Mississippi substages.

Phillips Bay Mill Site, 23CT235 (J. Price 1985c: 170-174)

Prehistoric cultural materials were recovered from excavation of historic deposits on this site which was tested in June, 1984. No prehistoric subsurface features were encountered in the excavations although they yielded an abundance of firecracked rocks and debitage. Projectile points/knives recovered from the site are cornernotched specimens dating from Late Archaic through Middle Woodland substages.

Shawnee Creek Site, 23SH11 (J. Price 1987a)

Excavations were conducted on this site in June, 1985, which yielded unanticipated results. During preliminary pedestrian survey on the site a shelltempered sherd was discovered on the surface. Two years later a 1 x 1-meter test unit placed in this area detected a burned lowered-floor, walltrench Mississippian structure. Excavations were expanded to expose a portion of the structure and recover a sample of cultural and chronometric materials. The structure had been constructed in an excavated basin with walltrenches inside its margin. Pieces of carbonized architectural elements lay on the floor. A large firehearth consisting of fire-reddened soil was discovered in the east-central

portion of the structure and a large postmold from an interior support post was found in the northern portion of the strucure basin. Also on the floor were large shelltempered pottery sherds and a green granite celt. The excavations also yielded small Mississippian arrowpoints. Three techniques of chronometric dating were conducted on materials from this structure. Sherds were dated with thermoluminescence, charcoal was C-14 dated, and hearth samples were submitted for archaeometric dating. All 3 techniques dated the structure ca. A.D. 1025-1075. Additional excavations conducted later on the site discovered 2 refuse pits containing an abundance of cultural materials including shelltempered ceramics, limestone tempered ceramics, small arrowpoints, and a broken green granite spud. Apparently the shelltempered and limestone tempered ceramics recoverd from the site are coeval since they consistently occur together in the same archaeological context. This indicates that the Mississippian occupants of the site had access to "Woodland" Maramec Spring wares that were still being made at this date by populations occupying the upper Current River Valley and the Salem Plateau.

Granite Quarry Cave, 23CT36 (J. Price 1987b)

Granite Quarry Cave on the Current River a short distance downstream from Van Buren, Missouri, was tested during June and July, 1985. It was selected for test excavations because a local teacher, Mr. Jimmie Lowe, had conducted test excavations in the cave in 1940 and recovered a quantity of shelltempered pottery sherds; and preliminary surface reconnaissance in the cave yielded such sherds and the profile of a freshly dug pothole in the cave floor revealed a large ash deposit immediately under the surface. Three 1 x 1-meter test units were excavated to

apparently culturally sterile soil and one-half of another unit was partially excavated. The deepest excavation was to a depth of approximately 67 cm. below surface. The midden deposit in the cave contained 2 prehistoric components. The upper component, from the surface to a depth of approximately 25 cm., contained a large amount of ashes associated with burned firehearths. These deposits yielded numerous shelltempered sherds and 3 small arrowpoints representing Mississippian occupation of the cave. Below this occupation zone lay a stratum of limestone gravel that essentially separated the Mississippian occupation zone from other underlying deposits. Below the limestone gravel was a dark midden containing an abundance of large red chert flakes and a cornernotched projectile point/knife as well as a fragment of another point that was probably cornernotched. Only 1 small shelltempered sherd was recovered from this lower occupation zone, apparently carried there by bioturbation. The lower zone below the limestone gravel stratum apparently represents a Late Archaic occupation of the site. Large quantities of animal bones were recovered from throughout the excavations. Most of these are flying squirrel bones (Klippel 1986). Many faunal elements were recovered that represent food remains. C-14 samples in the form of wood charcoal yielded dates in the 13th century A.D. for the upper or Mississippian occupation zone and samples recovered from the lower component date to the first century A.D. While the date is rather late for the Late Archaic substage, the deposit was assigned to this substage based solely on the absence of any ceramics. It is possible that the deposit is Early to Middle Woodland and that no Woodland ceramics were brought to the cave to enter the archaeological context there.

Mississippian ceramics from the upper occupation zone were very well preserved. Unfortunately, diagnostic rimsherds were very scarce in the sample recovered. A very small jar rimsherd from the deposits represented the lip only and not the entire profile of the rim. A larger bowl or pan rimsherd was recovered as well as a shortnecked bottle rimsherd. The Mississippian materials recovered from Granite Quarry Cave probably represent the last period when Mississippian occupation took place in the middle and upper Current River drainage. Apparently after ca. A.D. 1250 almost no human occupation took place in this region while large Mississippian settlement complexes grew in the lowland region of southeast Missouri and northeast Arkansas.

Summary and Conclusions

The archaeological testing program was a crucial part of the overall Ozark National Scenic Riverways Archaeological Project. Prehistoric sites selected for testing yielded important data on the nature of archaeological deposits and the material culture and subsistence of prehistoric human populations occupying the Current and Jacks Fork Valleys in the rugged Ozark Highland. An attempt was made throughout the testing program to select sites that would not normally be tested as part of routine management practices within the National Park. Park Service archaeologists routinely excavate sites in direct impact zones of campgrounds, picnic areas, access roads, river access ramps, and in high tourist traffic areas where adverse impacts are the greatest. Sites at Round Spring, Akers, and Gooseneck as well as several other loci have been tested by Park Service archaeologists. As part of this project sites were selected that potentially could yield significant data on a number of prehistoric stages or substages and

contribute to a better understanding of the major research objectives initially conceived at the onset of the project, understanding man's changing role in the natural environment of the southeastern Missouri Ozarks throughout the past.

Excavational data have been generated on various prehistoric cultural stages. Sites yielded data on the Archaic, Woodland, and Mississippi stages. No Paleo-Indian or Early Archaic cultural materials were discovered during the course of the testing program although such specimens are represented in surface collections from the region and an Early Archaic Dalton point was excavated by Park Service archaeologists at the Akers site. Most significant among the data generated by the testing program is the documentation of the ubiquity of the Emergent Mississippian presence in the Current and Jacks Fork Valleys. Seven of the 9 sites tested produced evidence of Mississippian occupation. This occupation was apparently intensive in the region during the 550 years following ca. A.D. 650. Test excavations unequivocally demonstrated the abundant evidence for this occupation and generated valuable insights into Emergent Mississippian settlement patterns, subsistence, lithic and ceramic technologies, and architecture. No longer can it be assumed that the southeastern Ozarks were isolated from cultural developments in the Mississippi Alluvial Valley during the Mississippian emergence and ascension. Quite the opposite is true. Developments that led to the cultural manifestation of Mississippian ca. A.D. 1250-1400 took place parallel to those in the so-called Mississippian heartland of the low-land region of the Central Mississippi Alluvial Valley.

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SECTION III

HISTORIC PERIOD ARCHAEOLOGY

Cynthia R. Price

INTRODUCTION

The Scope-of-Work (1981) stated that the goals of the historical archaeological research during the course of this project were to determine the nature of the historical archaeological resources in the Riverways and to describe their locational patterning, both for management and research purposes. The Technical Proposal (1981:26-51) outlined a number of research problems that might be addressed during the collection of data from the historical archaeological sites:

1) Site locational studies: an analysis of the locational patterning of sites during various cultural stages and the variables influencing locational choices

2) Frontier studies: a study of community systems, economic networks, and organizational variables

3) Agricultural modes: the kinds of commercial and subsistence agriculture (farms and plantations) that was practiced in the area and the relationship to community and organizational networks

4) Historic Indian settlement: the nature of such settlement and the nature and locations of settlement sites

5) Burial practices: the nature and variation of burial practices in both a geographical and temporal context and the relationship of the treatment of the dead to social systems

6) Structural/Architectural: the nature of standing structures and folk architectural patterns in the area

7) Socio-economic change: a study of socio-economic changes during particular time periods (the lumber boom era and the Depression, for example) and the effect on the local folk culture.

These were not intended to be exhaustive of the research problems

or questions that might be addressed using data from historical archaeological sites in the park, but represented those problems currently under investigation in the eastern Ozark region. The data generated during the present project could then be fitted into a framework for long term research here. Some of the research problems outlined above relate to specific cultural groups or time periods (for example historic Indian settlement and frontier studies) while others cross-cut cultural periods (burial practices and architectural studies). Given the limitations inherent in the present project (funding contingencies and time constraints; a number of research endeavors were approached with the available funds) and the limitations in the data that could be collected (Technical Proposal 1981:57-65), none of the research problems could be addressed in depth. With respect to two, those relating to historic Indian settlement and socio-economic change, few data were collected. In the case of historic Indian studies, few data could be found. Some problems were dealt with to a greater extent than were others; those relating to frontier studies received the greatest attention. During the project, at least some data were collected that are relevant to all the problems, and/or archaeological sites and documentary sources were identified that have the potential to produce data relevant to all the problems (and many others as well), including those that received little attention during the course of project funding.

The section of this report summarizing the archaeological work accomplished during the project (Archaeological Activities) discusses the historical archaeological endeavors. Prior annual reports submitted to the National Park Service-Midwest Archeological Center detail the work accomplished and the results obtained during each year of funding.

The Midwest Archeological Center has also been provided (under separate cover) with a set of maps showing the reported locations of sites found during the literature search, a set of tables describing the reported sites and the relevant references, and a bibliography of sources relating to historical archaeology in the park. Several papers, read at professional meetings and/or appearing in professional publications, address some of the research problems in greater detail than will be presented here (C. Price 1985; C. Price and J. Price 1986).

Following is a brief discussion of the kinds and nature of the historical archaeological sites found in the park and of their relationship to the various research problems. In summary, a brief discussion of site locational patterning will be presented. Management considerations are provided in a separate document submitted to the National Park Service-Midwest Archeological Center.

THE ARCHAEOLOGICAL SITES AND RESEARCH RESULTS

Introduction

When the present project began, 24 historical archaeological sites had been recorded in the park; very little was really known about most of them. A number of cemeteries had been visited by park personnel and listed with the park headquarters, and the standing structures in the park had been inventoried a number of years ago. Neither the cemeteries nor the sites with standing structures had been considered with respect to their anthropological or archaeological potential and significance. The literature search for this project identified over 250 reported sites and locations in the park. Of these, 40 were located archaeologically during field surveys. An additional 42 historical archaeological

sites, not found reported in the literature and not previously recorded, were found. Five of the sites were tested with a series of excavations. Table 3-1 gives information on the reported and archaeologically recorded sites by temporal periods. Certainly not all of the historical archaeological sites in the park were visited and recorded; likewise, not all of the sites present are documented in the literature. The sites recorded during the project are but a small sample of those actually present. The sample does not necessarily contain representatives of all of the various kinds of sites expected to be present. The work to date does, however, give us a good look at what is present, at the nature of archaeological deposits, the research potential in the park and the area, and a better understanding of cultural developments during the historic period. The following discussion is, for the most part, organized by temporal periods rather than by functional categories of sites. Each temporal period includes a variety of functionally diverse sites as noted below. The general cultural-historical developments for each period and the functional categories of sites are given in the first annual report (C. Price 1983) and will not be repeated in detail here. Likewise, detailed discussions of research questions will not be given; these are better presented in the professional papers completed and under preparation (copies of all are provided to the Midwest Archeological Center).

Historic Indian Settlement

Various displaced eastern Indian groups were reported to have settled for varying lengths of time in and near the Current River and Jacks Fork valleys. Most groups probably arrived during the second or third decades of the nineteenth century, and for most of them the stay

was short. They were on their way west as they were pushed ahead of expanding American settlement and frontier development. Groups reported to have been in the Current river area were the Cherokee, Choctaw, Peoria or "Peola," Piankashaw, Shawnee, and Delaware. C. Price (1983: 58-62) lists the reported locations in the park, most taken from secondary sources.

The problem of historic Indian settlement in the Current River/ Jacks Fork area was one of primary importance to this project. Locating the settlement sites archaeologically was a research and management priority. A number of historic Indian settlements are reported at various locales in southeast Missouri, both in the Ozark highland and in the Mississippi valley, but none has been visited by professional archaeologists. In the absence of archaeological data and in light of the reported settlement in the Current River area, the present project could provide an opportunity to research for and investigate at least some of these sites.

Several of the historical repositories in the state contain good documentation for historic Indian settlement in the park area. Delaware settlement was the best documented in the primary sources that were used. The Richard Graham Papers in the Missouri Historical Society, St. Louis, contain numerous documents relating to Graham's role as Indian agent in the state. There are references to the Delaware on the "Currents" from 1821 to 1822 when they were joined by another group emigrating from Ohio and Indiana during that winter. The documents include letters, receipts, and lists of rations, annuities and goods supplied to them. While the documents provide considerable historical and anthropological information on the Delaware stay in the

park area, no specific settlement locations were found. According to Morrow (1981:152) and Brown (1969:6-7, footnote 5), the William Clark Papers at the National Archives and Records Center, Kansas City, contain additional information, but again settlement data were vague, giving the location within a 45-90 mile radius. The only specific locational information found was on two maps, Colton (1869) and Hutawa (1844), indicating an "Indian Village" near Alley Spring. The source of the mapmakers information was not traced.

A second source of possible site locations was found in the information obtained from local collectors during the Collector Study carried out as part of this project. One knowledgable local collector had a number of small triangular arrow points as well as a possible iron projectile point from several sites in and near the park. A second collector had a number of unusual gunflints from one of the same locations. The affiliation of the arrow points is not clear. They cannot be tied to particular prehistoric groups in the area; and they may be either protohistoric or historic in origin. Similar arrow points occur with the late Armorel (or Late Nodena) phase in the southeast Missouri lowlands. They are also reported with historic groups as the Osage and Missouri. The iron point and gunflints may be associated with either Indian or American use. However, that particular kind of gunflint has not previously been found in the eastern Ozarks on American sites.

The paucity of specific locational information in the primary documents precluded the search for settlement sites based on those sources. We had no place to begin looking. The sites from which the collectors had obtained possible historic Indian materials and several of those locales reported in the secondary and less well-documented

sources were checked during survey work with negative results. The site from which the gun flints and iron "point" were taken (23SH18) was in the vicinity of the "Indian Village" on the Colton and Hutawa maps. It is in two open field tracts, one of which is overgrown in dense vegetation; part of the other was under cultivation during survey work. Shovel testing was hampered in the overgrown tract. Careful searching in the cultivated tract failed to produce any early historic cultural materials. A second site, 23SH35/36, from which a number of triangular arrow points were collected, was also under cultivation. Again careful searching failed to produce any additional points or early historic material. Sites, 23SH40 and 23SH48, also produced the triangular points. Access to the first could not be found (it may be in private ownership) and the second is outside the park. Finally, a locale near the mouth of the Shawnee Creeks, including sites 23SH11 and 23SH37, reported to be a Shawnee settlement site, was surveyed. Site 23SH11 was under cultivation when first visited and was later tested in 1985. Site 23SH37 was in sparse pasture. No historic materials were found on either site.

Although the survey work accomplished during this project was disappointing in the negative results, the literature search produced a wealth of information on at least the Delaware stay in the area. The descriptions of subsistence, material culture, and Indian-government relations, for example, suggest the potential for anthropologically addressing the research problem as outlined in the technical proposal. The failure to archaeologically locate the settlements during this project, cannot necessarily be used as an argument against the presence of historic Indian sites in the park. Only a small part of the total

park area was actually surveyed. The Delaware were definitely in the area for at least two years; whether they lived within what are now the park boundaries or just outside is not certain. Nevertheless, the documentary data alone can provide excellent interpretive material for park visitors. The native American presence here is an important one; not that it necessarily or greatly affected the Euro-American settlement which prevailed. It was a critical time in American Indian history and acculturation. It is quite likely that with further research and field work, the archaeological sites can be found. Until they are, their possible presence in the park should be kept in mind.

Early to Mid-Nineteenth Century Frontier Settlement

Euro-Americans began settling in the Current River Valley probably as early as the very late eighteenth and early nineteenth centuries. Settlement began to expand and populations increased by about the second or third decades of the nineteenth century. Most of these settlers in the park area were of Scotch-Irish background. As noted above, groups of American Indians stopped briefly in the Current and/or Jacks Fork valleys during the 1820s, but they probably had little effect on the nature of American settlement. The census schedules record several first generation Europeans in the park area, but there was no clustered settlement of these individuals as such. German immigrants and, late in the nineteenth century, eastern Europeans, settled in groups elsewhere in southeast Missouri, but there is no record of such ethnic communities in the riverways. The Scotch-Irish were essentially the dominant cultural group. As early as the nineteenth century, Current river drainage was an agriculturally based frontier, and settlement was

generally in the form of small family farmsteads scattered along the stream terraces of the Current and Jacks Fork valleys. Although, most settlers were agriculturalists to a greater or lesser degree, some were also entrepeneurs, engaged in commercial farming and manufacturing as well. During the pre-Civil War period there were a few plantations in the area and an early and extensive lumber industry developed in the Current and Jacks Fork valleys. The park area was tied into a greater regional economic and socio-political network through community and county organization.

This period of initial Euro-American settlement and its expansion, until the time of the Civil War, has recieved the most attention during the project. This in part because of the number of archaeological sites dating to the period that were found and in part because of ongoing research concerns. Several of the research problems outlined in the Technical Proposal (above) relate to the frontier period. Documentary data for this period are abundant, and site locational data are good. Among the kinds of documentary sources found are: nineteenth century accounts and journals from travelers through the eastern Ozarks (for example, Featherstonhaugh 1968; Schoolcraft 1821 and 1853; Bek 1929; Babcock 1864; Bell 1957); nineteenth century letters (the Reed Letters reprinted in Orchard and Orchard 1977); county records (marriage, land and deed records, county court, probate); early geological publications; nineteenth century store accounts; maps and General Land Office survey plats and notes; and local and regional histories and genealogical works.

Archaeological data are also good. A number of functionally distinct kinds of sites that date to this early frontier period have

been archaeologically recorded and several tested during the project. The kinds of sites archaeologically documented are: farms, plantations, and residences; cemeteries; grist mills; saw mills, towns; rural stores; and roads. Those kinds which are reported in the literature but were not archaeologically recorded include: communities, schools, a tannery/distillery, copper mines, and fish traps.

As might be expected, the most numerous sites associated with this period are the farmsteads and residences. Thirty-nine specific site locations for early to mid-nineteenth century farms, plantations, or residences were found in the literature. This is expected to be only a very small percentage of the actual number of such settlements present. Sixteen archaeological sites were located during the field survey with 3 additional sites that may contain an early component (each of these produced one or two artifacts that may date to this period). Eight to ten were among those reported in the literature, and 7-9 were not. Of the sites located, three are residences associated with other enterprises - two with a mill and one with a store. One may be a plantation and the rest are probably small family farmsteads or cabins. Two have standing structures on them which probably date to the Civil War or pre-Civil War period. Ten to twelve of the sites have been under cultivation; two are in Park Service campground developments; two or three contain late nineteenth and twentieth century habitations as well; and one appears to be possibly relatively undisturbed. One and possibly a second site date to the very early period of settlement. The remainder post-date ca. 1830s.

Four of the sites were tested: Fanchier, a very early pre-1830s site; Isaac Kelley, a possible plantation and possibly dating to the

early period; Culpepper, a farmstead; and the Phillips Bay Mill habitation area. Surface collections were obtained from most of the other sites; the extent of the collection depended on the condition of the site when visited - whether under cultivation, in pasture, or developed. Measured drawings were made of the standing structures (both are hewn log cabins) and detailed notes were taken. Exhaustive literature searches were not done for background information on most of the sites; the readily available sources were, however, consulted for each. The amount of documentation found varied considerably. For some sites, it was plentiful; for some we found the name of one of the inhabitants; and for many, we do not know who lived there and have essentially no documentation (and such documentation may never be found for any number of these kinds of sites). Finally, at least three of the reported site locales were visited on a number of occasions with negative results. One of the locales was shown as a habitation and fields on the General Land Office survey plat (registered in 1840) and two locales were noted in local histories. Family cemeteries were found at all three locales suggesting that there had been a habitation somewhere nearby.

The test excavations indicated that these kinds of sites have a great potential to produce data relevant to a number of research questions (detailed descriptions of the testing and findings and preliminary analysis for all of the tested sites are found in the annual reports, C. Price 1984, 1985a, 1986). Even those which are or have been under cultivation contain some undisturbed archaeological deposits and can produce a wealth of information from even the plowzone materials if carefully collected and analyzed (C. Price 1984, 1985a). With the exception of the very earliest site, Fanchier Site, all of the sites

contained sub-plowzone cultural features. At the Culpepper and Phillips Bay Mill sites, portions of relatively large and deep pits features were excavated. Both produced a variety of cultural materials, including floral and faunal (subsistence) remains. The Phillips Bay Mill feature also yielded what are normally perishable cultural remains (unburned wood planks, paper, and a medicinal substance).

Associated with the farmsteads are small family burial plots; burial was most often near the homes rather than in community cemeteries during the time of early settlement. A number of these were recorded during the project and are discussed below (Cross Temporal and Cross Cultural Research Problems).

In addition to the farmsteads, a number of other kinds of early frontier sites are reported and archaeologically documented in the park. Mill sites, both grist and saw, are among the most numerous of these. Although grist and saw mills may have served somewhat different functions in the community, the same mill often was used both to grind grain and saw lumber. Fifteen mill sites dating prior to the Civil War were found reported in the literature. Two of these, Woods Mill and Phillips Bay Mill, which certainly date to this time period, were found and investigated during survey work. Two other mills, at Round and Blue Springs, which likely date to this time period were also recorded archaeologically. They both certainly pre-date ca. 1870. The reported early mill sites at Welch and Pulltite Springs were visited; no remains of either mill were found and they undoubtedly have been destroyed by the early twentieth century retreat and lodge developments. None of the other mill sites reported from this period were searched for.

The two sites which were intensively investigated, Wood and Phillips Bay Mills, are well documented (for example in the county deed records). What is believed to be the account book for one of the mills was found in one of the state repositories (though it is not catalogued as such). Woods Mill probably functioned as both a grist and a saw mill; Phillips Bay Mill was a saw mill and it is not known if it also processed grains. Both of these mills contain relatively well preserved cultural features associated with the milling operation (mill races; mill dam; mill site foundations; log holding pond; and features of uncertain function). Neither mill complex has been cultivated. These were carefully mapped and detailed notes were made on the mill layout and feature construction. Testing was done at Phillips Bay Mill; most of the excavation was confined to the adjacent habitation area and only one test unit was placed in the mill complex.

Given the excellent state of preservation of these two sites coupled with the available documentary data, the research potential of this class of sites is tremendous. The development of the early sawmilling industry in the Current and Jacks Fork valleys has been generally unrecognized, although such developments in the nearby Piney, Roubidoux, and Meramec drainages have received attention. The archaeological sites and historical information can certainly inform us of the nature and extent of the industry during the frontier period here. The work done during this project, though limited, represents the first archaeological investigation at early frontier saw and grist mill sites in the region.

Generally central to the community or county organization were the frontier towns or county seat towns. Three of the early frontier county

seat "town" sites are located in the park area. Only one, Old Eminence, is within the park boundaries. Old Eminence was the first county seat of Shannon County, ca. 1840s to 1860s. It was burned during the Civil War; after the War, the county seat was moved to its present site at Eminence. Old Van Buren, the first county seat of Ripley and then Carter Counties, is just outside the park and Doniphan is downstream several miles. Documentary information on these sites were found in state gazeteers, travelers diaries, Civil War documents, Federal Census records, and the county deed records, but surprisingly, little historical information was found specifically for Old Eminence, the site of the park. The site of Old Eminence, 23SH104, is wooded and relatively undisturbed. Testing conducted at the site was aimed at determining something about site function and occupation span (C. Price 1984). The excavation results and the little documentary data available suggest that the town is best characterized as an "isolated political center" serving principally political centralizing functions. Such functional data are needed to address the problems of cultural organization and community settlement (C. Price 1984). Information on the structures present at the town, a jail and a courthouse, and their construction was also obtained. The cultural features are remarkably well preserved, with charred beams and flooring planks still in place.

A number of other sites, including stores and roads, are reported in the park, but few were investigated during the project. One of the early store sites, the Deatherage Store, 23SH110, was located archaeologically, with assistance from a local resident, just prior to the beginning of the present project. An account book said to have been associated with the store is on file with the Missouri Historical

Society, St. Louis. No testing or other investigative procedures were done at the site. This site, and the others, should they be found, will undobtedly produce information on local economics and access to goods. The availability of accounts enhances the research potential.

A number of the historical sources provided information on the routes of early roads; early maps, General Land Office Survey plats, and county court records are the most valuable. Several roads were located archaeologically during the project, but determining the age is difficult. One, 23SH102, near Old Eminence, probably dates from this period. Archaeological sites representative of the other kinds of reported sites were not found. The reported tannery-distillery was looked for, but not found; the area was, however, densely vegetated.

The archaeological work coupled with the documentary data gives us a relatively good picture of the area during frontier times and will allow us to address a number of research questions in some detail. As might be expected, the research has also raised as many questions as it has answered.

For example, we do not really have a good idea of the extent of settlement in all parts of the Current and Jacks Fork valleys and in the smaller tributary valleys. We are missing land patent records for Shannon County, which comprises the greatest part of the park.

Local histories suggest that settlement at least as far upstream as Owls Bend was as early as that in the lower Current. Archaeological data tend to confirm this. The earliest historical archaeological manifestation found in the park, the Fanchier site, is at Powder Mill. An analysis of the 1850 census records suggests that by that time, settlement had increased relatively equally in all parts of the Current river

valley. Indeed, archaeological sites dating to the period ca. 1830s-1860s have been found in nearly equal numbers in the upper and lower Current (6 in the upper Current, 6 in the middle reaches, and 4 in the lower end of the park). Documentary data indicate that settlement was also extensive in the lower Jacks Fork valley. The extent of settlement in the upper Jacks Fork is still an unknown. The paucity of documentary data found for that area and the ineffectiveness of the field survey leave us with almost no data on presence, absence, or extent of settlement. The terrain is quite different in that part of the park; the valley is very nearly a canyon with few expanses of stream terraces. If present, settlement would be expected on the ridge tops, which are relatively flat and wide and which are in pasture today. The land patent data for the lower part of the park suggest that settlement was as extensive in the larger tributary valleys as along the main streams. Whether or not this holds true for the upper reaches as well is not yet known.

A paper presented at the meetings of the Southern Anthropological Society, 1985, which looks at the variation in cultural organization in the valleys during the early frontier period (C. Price 1985b), provides the most detailed discussion of the frontier period research. The study uses the archaeological data, both survey and excavational, and analysis of certain sets of historical data, principally the Federal Census Records, population, agricultural, and products of industry schedules, to examine two distinct settlement patterns evident in the Current River valley (see the Technical Proposal 1981: 32-35, 37-40). Until about the time of the Civil War, settlement organization in the Current was less centralized and formalized than that in the middle and lower stretches

of the stream. The county organization in the upper Current lacked a true frontier town, or settlement that served to centralize social, political, and economic activities. A number of settlements each served a single centralizing function. Old Eminence, the county seat of Shannon County, was essentially an isolated political center that served generally political functions. Absent were the stores and inns that in other frontier towns, along with the courthouse, were the Center of economic and social, as well as political, activities. Frontier towns developed in Carter and Ripley Counties, lower on the Current. The reasons for the differences in settlement in the two parts of the valley are complex and varied. An analysis of farm size and agricultural production (using the agricultural census records) indicated that the number of farms increased steadily in the upper Current while farm size remained relatively constant. In the lower Current, farm size increased steadily, suggesting increasingly greater commercial production there. Likewise manufacturing, in the form of lumber production (sawmilling), and the use of slave labor in both manufacturing and agricultural production were much more extensive in the lower valley areas. Finally, the population in the upper Current was less differentiated; fewer individuals were engaged in service occupations there. The developments in the lower Current necessitated a more complex form of county organiztation for increased participation in a market economy. The differences in economic development are in part influenced by topographic differences in the upper and lower Current. The more rugged terrain and the shallower and swifter streams in the upper Current make travel and transport more difficult than in the foothills of the lower Current drainage.

One of the research problems to be addressed concerned access to commercial goods and trade networks in the eastern Ozarks and in the Current and Jacks Fork valleys during various cultural periods. A common conception is one of the Ozarks as isolated from outside trade (see Stewart-Abernathy 1985); and this is particularly seen as a trait of the frontier era. The coming of the lumber boom and the railroad is thought to have been a factor in opening the region to outside trade, ideas, and influences (see Flanders 1979). The data relevant to this problem are plentiful; but raise as many questions as they answer. They suggest, as Stewart-Abernathy (1985) demonstrated for the Arkansas Ozarks, that the concept of isolation is probably a misconception. Store accounts and ledgers are available for the years 1830s in the lower Current and for the 1850s in both the lower and upper Current. These, coupled with the archaeolgoical assemblages at the various sites, indicate that access to goods was relatively open and that a wide variety of goods was available for trade. Traded in exchange for the "store bought" goods were local products - farm produce and wild products such as honey, wax, skins and pelts, and herbs. The excavations at the Fanchier Site, the very early pre-1830s site, however, suggest that the trade networks may have been developed later than initial settlement. There were very few goods found at the site, suggesting that such commercial products may not have been available prior to about 1830 or so. The Isaac Kelley Site, in the lower part of the park was reported to have been settled prior to about 1820. Excavations at that site also failed to produce any quantity of material which could be dated much before ca. 1830s. The early date of the reported settlement was questioned; but it may well be that the site was occupied that early

and that, again, commercial goods were not available in quantity. This raises questions and poses problems in identifying, archaeologically, sites of Pre-1830s habitation.

In summary, the frontier period in the park and surrounding areas is well documented, both historically and archaeologically. The park contains a wealth of archaeological resources dating to this period, relatively well preserved, with the potential to provide data to address any number of research problems. The above examples are only a beginning in the kinds of problems that can be investigated with the data now at hand and with those which might be obtained with further work. The sites dating to this period are numerous and fragile. As noted in the management document, which was submitted as a separate package, some of the park activities and policies are contributing factors in increasing damage to the sites. The archaeological data become critical to answering many of the questions; for example that of extent of settlement in the absence of land and other documentary information.

The Civil War

There is abundant documentary data on the period of the Civil War in the Riverways area both in primary and secondary sources. For example, in a brief search of the Official Records of the War of Rebellion (U.S. War Department) over 40 reports of activities in and near the park were found. Other sources include letterbooks (Wedemeyer 1862), memoirs (Elliott 1902), local and family histories (Lewis 1978: 13-14; 1980:43; Orchard and Orchard 1977:191-193; Smith 1978:13; Oakley 1970:18-20; and published secondary historical sources on the War. Activities in the park area included troop movements through the area;

scouting expeditions from nearby headquarter locales (as Houston, Salem, and Centerville); and a few skirmishes. The effects of the war on the local population were enormous. Most scouting expeditions ended in killings; the burning of homes, mills, and towns; and the confiscation of crops, livestock, and other personal goods. In part, the effects of the conflict on the local population and economy can be seen in the Federal Census records for the years just before and after the War (see Flanders 1979:206-208 for a good description of the War and its effects in Shannon County).

The kinds of archaeological sites expected to be found in the park, based on the literature, are primarily camp sites and skirmish sites (see C. Price 1983:108-124). As was the case with American Indian settlement, the documentary information is abundant, but specific site locational data are rare. The only specific activity location found in the literature search was that of a skirmish at the Shannon County seat, Old Eminence. The site was tested extensively in 1983 (C. Price 1984); no identifiable Civil War artifacts were found. None of the reported camp sites or other skirmish sites were searched for because of the absence of specific locational information. One local resident reported the finding of Civil War artifacts at site 23SH35/36. This site was visited several times during the field work on this project; no additional materials were found. During the course of the project, one Civil War period artifact, a single cannon ball, was found during the testing of a prehistoric cave site.

Whether any archaeological sites as camps or skirmishes will be found in the park is not known. The effects of some activities, such as the burning of homes or mills, may well be identifiable

archaeologically should those particular sites be excavated. Again, the documentary data are sufficient to effectively interpret the War and its effects on the local people for park visitors. It is not unlikely that the additional searching in archives, repositories, and among family keepsakes will produce additional Civil War period letters and diaries from the area.

Late Nineteenth/Early Twentieth Century

The post-Civil War and pre-World War II settlement in the park appears to have remained much as it was during the earlier period. The park area remained rural in character with agriculture the primary pursuit of most of the population. Small family farms were the rule (plantations, of course, ceased to exist). The data on the development of commercial agriculture and tenant farming in the park area were not obtained but should be available. The information in the local histories suggests that commmercial development was late and that tenant farming was not the rule. The picture is one of general subsistence farming, particularly in the upper and middle Current river valley, the area now encompassed by Ozark National Scenic Riverways. During the late nineteenth and early twentieth centuries, a lumber industry developed in the area to an extent unequalled in the past. The boom period is often characterized as one of cultural change for the local population. Companies from the east arrived ca. 1880s to exploit the eastern Ozark pine timber, and the Current River valley was in the center of the enterprise. Following the boom and the disappearance of the pine, oak and other timber continued to be cut, and products such as staves and ties were marketed. The post-boom industry was carried out on a smaller scale with family owned sawmills as common as small commercial

operations.

A number of different kinds of sites are associated with this period, and with the exception of the lumber boom sites, most are the same as those discussed under the earlier nineteenth century: farmsteads and residences, mills, stores, schools, churches, roads, and towns and villages. During the course of the project, less emphasis was placed on research relating to this period. Fewer sites were specifically searched for, but those encountered during field work were recorded. Documentary data available for this period include Federal Census records, maps, store ledgers and accounts (for the Alley and Cedargrove stores at least); and perhaps most important, interviews with long-time local residents. Historical information specifically for the lumber boom may be found in the company records on file at the State Historical Society of Missouri; in local, county, and regional histories; and in the interview transcripts and photographs on file with the park headquarters.

The farmstead sites dating to the post-Civil War period are numerous in the park. Little effort was made to search the documentary data for site locations with respect to this kind of site. This is not to say that these sites are not important; they are. Twenty-two were recorded during the field work, more than any other kind of site; none were tested, but three were intensively investigated at the survey level. These three contain standing structures; two are earlier log cabins modified during the post-Civil War period. The third is a farmstead with several buildings intact. The latter site, the Nichols Cabin Site, is a remarkably well preserved example of a turn-of-the-century farmstead. Although occupied by the same individual until the

1950s, it was never modernized and remains much as it was when first established. The site was mapped, and measured drawings made of each structure. The cabin is of a unique form of construction, put together without framing. Vertical wall boards are attached at the top to roof members and at the bottom to the sills or joists. Such construction was relatively common in the area during the late nineteenth and early twentieth centuries, but few examples survive. The two earlier log structures, the Macy and Maggard (or Howell) cabins, were enlarged with sawn board additions during the late nineteenth or very early twentieth centuries. Door and window openings were changed as was some of the building hardware. The other farmstead sites recorded are in varying states of preservation or deterioration. Some have been cultivated; others contain remnants of building foundations.

Although little information, other than structural, was obtained from these 22 sites during the project, their data producing potential is rich. For example, they will yield information on the material cultural assemblage as it relates to socio-economic status, to home production and the acquiring of commercial goods, and access to goods and economic networks. Subsistence information will be available in faunal and floral remains as well as in the kinds of containers found in refuse deposits. As was the case with the earlier farmsteads and residences, even those which have been under cultivation may produce considerable information. Documentary data should be available for many of the sites; many were occupied within the memory of local residents and as such provide a good opportunity for ethno-archaeological research.

As was the case with the early to mid-nineteenth century, many mills served both to process grain and lumber. Nine mill sites which

can be certainly dated to this period were reported in the literature. Seven and possibly an eighth were recorded archaeologically. One, Woods Mill, dates also to the earlier period; two, those at Round and Blue springs, may also date earlier; the remainder, Alley, Klepzig, and Pulltite, were established during the late nineteenth century; and Deatherage Mill was an early twentieth mill. A stone feature, which is likely a part of the mill dam or mill site, was found at the reported location of the Baum and Jack gristmill, for which no date was found. The mill structures are standing at Alley and Klepzig. That at Alley Spring represents a community or commercial operation; that at Klepzig is a neighborhood or family mill. Cultural features are evident at several of the other mill sites, as mill dams and structure loci. A ninth, possible mill site, was recorded at Cave Spring also. This development, however, is not clear as to date or function.

Four communities or villages dating to this period are present in, or partly in, the park: Chilton, Cedargrove, Akers, and Alley. All were visited and three recorded as archaeological sites. Chilton is still functioning as a community, and most of the site lies outside the park boundaries. Akers is now a park campground and river access development. The others are no longer inhabited sites. None of the sites were tested. For all, there is sufficient documentation so that along with archaeological information the number and placement of the buildings can be determined. Additional information on socio-economic networks within the community should be readily available.

One rural blacksmith shop was recorded during the project; it had not been found reported in the literature. The site is wooded and appears to be relatively undisturbed. Cultural features were mapped.

The site was not tested.

A number of rural schools are located in the park. Four have been recorded during field work: Cardareva, Lower Parker, Bluff, and Buttin. Cardareva School site is in a campground development; the other three contain standing structures. These were measured and detailed notes taken on construction and interior arrangement.

From late nineteenth century on, tourism has been important on the Current and Jacks Fork rivers. As early as the 1880s, hunting and fishing clubs, comprised of a membership from St. Louis or Kansas City, were established in the area. Later private cabins were built, and occassionally health spas or retreats were tried. Documentation on these sites includes the articles of incorporation and other documents from the early hunting and fishing retreats (in the Missouri Historical Society, St. Louis); journals of float trips on the streams; information from local residents and oral history interviews; and photographs. Several archaeological sites associated with retreats and tourism were recorded: Diehl's Hospital at Welch Spring, which includes remnants of the hospital structure; the Pulltite Lodge which is still standing, built ca. 1911 by a group of businessmen as a hunting retreat; the possible site of a Salvation Army camp, and a private summer cabin. Although only one example of a private summer cabin was recorded, these sites are numerous in the park. Most of the structures have been removed with heavy equipment, burned, or allowed to deteriorate. A number of these were recorded on the initial standing structure inventory of the park.

Although none of the rural stores reported in the literature were recorded archaeologically, such sites are certainly expected to be

present. Store ledgers of accounts are available for at least two of the establishments - the store in the Alley Community (on file at the park headquarters) and that at Cedar Grove (see Smith 1978). These data will be useful in comparing the access to goods and economic patterns with those of the earlier frontier period and in looking at changes as they may relate to the coming of the railroad and lumber boom.

Although roads are difficult to date in the absence of good documentary data, three archaeological road sites which were found are probably associated with the post-Civil War era. These include a ridge-top road above Pulltite, a short road segment at Owls Bend, and the Buttin Road, recorded as an historical site in the park and pre-dating the 1930s. This latter may well date to the period of early settlement. All are evidenced by a shallow depression, the old road bed, and all are not abandoned.

Three stone features were found which again are not certainly dated, but are likely to be associated with this time period. Two are stone walls; one a retaining wall and the other either for erosion control and/or for marking a boundary. The third is a stone feature in the Jacks Fork. It may be either part of a mill dam or part of a fish trap and is most likely the latter.

A number and variety of sites associated with the timber industry, both the commercial boom period and later exploitation, are expected to be in and near the park. Those associated with the larger operations included milling centers, railroads, trams, cutting camps, depots and towns, and secondary mill and collections centers. Most of the sites reported and archaeologically recorded in the park are associated with the companies based at Birch Tree and West Eminence, Cordz-Fisher and

The Missouri Land and Lumber Company respectively. The major mill centers and towns are all just outside the park boundaries (Grandin, Fishertown or Winona, Birch Tree, and West Eminence). Those sites reported in the park include railroads, trams, and camps. Three sites were recorded archaeologically during survey work: 1) the bed of the Current River Railroad, 23CT188, which was built ca. 1888 and ceased to be used ca. 1940; the bed can be traced for several miles in the Big Spring area; 2) trams, 23SH204; the bed of three sections of one of the major tram lines in the upper Current was traced for several miles in the Pulltite area; the tram had been mapped in a local history; 3) Camp 12, 23SH265, one of the cutting camps along the tram noted above, was found in a small tributary valley in the upper Current; it also was reported in a local history. None of the sites were tested.

Sites associated with the later timber industries include tie yards and small family operated mills. A number were reported in the literature, but none were found during the field work. None were specifically searched for.

Although this period was not one which received much emphasis during the course of the project, some of the research problems were addressed to a limited extent. As was the case for the earlier period, we are missing data on the extent of settlement in some parts of the park. Farmstead sites dating to this period are numerous and are found in all parts of the park, again with the exception of the extreme upper Jacks Fork valley. They also extend up the tributary valleys (the Nichols Cabin Site for example). The farmsteads appear much as the earlier farms did. The addition of barns seems to represent the principal change in farmstead composition. Information from interviews with

local residents and historical sketches and memoirs (as Kenamore 1925) suggest that there was little change in subsistence, economic, and exchange networks during the nineteenth and early twentieth centuries. Such information should be obtainable from archaeological investigations as well.

By the post-Civil War era, the organization of the upper Current became more like that of the lower with the establishment of the present town of Eminence. The coming of the lumber boom in the late nineteenth and early twentieth centuries seems to have affected all parts of the valley. At least the sites associated with that period of exploitation are found in all parts of the Current and middle to lower Jacks Fork valleys. The larger milling centers and main railroad line were nearer the lower Current and lower Jacks Fork (Grandin and West Eminence); but tram spurs and camps were scattered throughout the Riverways, with the possible exception of the extreme upper Jacks Fork. Villages or communities, as Cedargrove and Akers, on the upper Current served the social and economic needs of the population there. The period of the lumber boom is often characterized as one of cultural change in the eastern Ozarks. The coming of the railroad and the increase in population, often from outside the region, is thought to have been a factor in opening the area to outside trade and ideas (see Flanders 1979 for a good discussion of this period in Shannon County). As noted above, the area appears not to have been particularly isolated in prior periods, but rather tied into an intra-regional trade network. Whether the lumber boom really had a significant effect or stimulated any profound cultural changes here should be carefully addressed (see also Stewart-Abernathy 1985). It may be also that some of the riverways remained

more isolated than others. Although the data were not obtained during this project to fully address the problem of the effects of the lumber boom on the population as a whole or possible differences in effects in the upper and lower Current and Jacks Fork valleys, the data should be readily obtainable through further research. Data on material assemblages from a sample of archaeological farmstead and residential sites as well as information in the store ledgers from Cedargrove and Alley should inform on the effects of increased access to goods with a possibly expanded market economy and the coming of the railroad.

Cross-Temporal and Cross-Cultural Research Problems

Architectural-Structural

There are a number of standing buildings in the park; these date from the early to mid-nineteenth century frontier period to the late nineteenth and early twentieth centuries. They include residences, rural schools, churches and mill structures. There are two hewn log structures dating at least as early as the middle part of the nineteenth century (the Macy and Maggard cabins). Although these were modified sometime during the latter part of that century or during the very early twentieth century, the traits characteristic of the initial construction are evident. The Nichols Site contains not only the cabin described above (late Nineteenth and Twentieth Centuries) but farmstead outbuildings as well. These latter structures are a combination of un-hewn log and sawn board construction. The changes in styles and construction technique over time are indicative of changing cultural values with respect to living spaces. The original number of rooms and the structure layout, changes in these through time, room function, square

feet of total living space during different periods, and interior decoration are all evident in the standing residential buildings. The architectural style is essentially a folk one; the styles are not formally derived. As noted above, the Nichols Cabin is a rare surviving example of what was once a common construction technique - one without the use of framing. (See Glassie 1968 and 1975 for a good discussion of folk architecture and its potential for information on changing cultural values.)

The mill structures represent both a large commercial flouring mill and a small family operated neighborhood mill. The Alley mill has been well documented; the Klepzig mill has not. It represents again a surviving sample of a once common structure in the area. Likewise the school buildings; the literature search found a number of reported school sites in the park. Few of the buildings associated with the sites remain.

The standing structures in the park cannot be taken in isolation and evaluated without regard to other factors. Each is a part of a larger site; one that includes archaeological features as well as the standing building. The building is but one feature on a complex site. Those here, indicative of a locally developed folk culture should be assessed from an anthropological or folk culture perspective as well as from an architectural one. The data producing potential of most cannot be separated from the archaeological or anthropological potential of the site as a whole (see Deetz 1977).

Cemeteries

Most of the cemetery sites recorded in the park date initially to the early frontier period, but continued in use to the late nineteenth

or twentieth centuries. At least 33 cemeteries and 12 isolated graves are reported in the park. The documentary sources reporting these sites include USGS quadrangle maps (both the old 15' and more recent 7.5' series), county deed records, a listing on file with the park headquarters, and information from local residents. Fifteen cemetery sites were visited and recorded during the project; fourteen were among those previously reported and one was not. Several others, reported in the literature, were searched for but were not found.

All of those investigated probably began as small family burial plots; some continued to be used and came to serve a neighborhood or community. All of those recorded are rural cemeteries; some are well maintained and regularly visited and decorated; some are overgrown and all but forgotten. Most if not all were probably established prior to the Civil War. At least three appear to date only to the pre-1870 period; they contain few graves and no commercial stones or markers. The grave treatment and markers used varies considerable among the sites. The pattern in the Current and Jacks Fork valleys is marked by simplicity in the early settlement period with simple field stones (or other unusual stones as prehistoric mortars or cave formations) used to mark the graves. These are seldom shaped or inscribed. Two of the sites contain stones unique to the park area and rare in the eastern Ozark Border area. They are early (two are dates, 1848 and 1859) carved stones, one with coffin in deep relief on the front and three in stylized anthropomorphic shape (see C. Price and J. Price 1986). After the Civil War, one sees an increase in locally made markers, usually of cement and often with inscriptions and decorated with folk motifs, and in commercially made stones. The latter however are rare until well

into the twentieth century. Readily available objects were at times used; painted bricks and a concrete block were noted in two cemeteries.

Work on the project demonstrates that these sites can provide information on burial practices, variations in burial and grave treatment on both a geographical and temporal basis, changing attitudes toward death, outside or non-local influences in the number and use of commercially made markers, as well as demographic data. Very few of the cemetery sites present in the park have been recorded. Many are disappearing or suffering from vandalism (one of the early cave stone grave markers in the Fanchier Cemetery was stolen in 1985); and an effort should be made to record and protect them.

LOCATIONAL ANALYSIS

For managment purposes, the locational patterning of the historical archaeological sites was to be determined. Because of limitations in data collection (limitations from funding allocations and availability of data), formal locational models cannot be constructed. The following problems were encountered in obtaining the needed data: 1) absence of soils and other environmental data for most of the park; 2) the small sample of specific kinds of sites recorded; 3) survey biases; most work was done in the open field/food plot tracts which are located on the T-2 and T-3 terraces of the Current and Jacks Fork; although some survey was done on other land forms (as ridge tops, slopes, and small tributary valleys) it is insufficient for model building; 4) dense vegetation in the upper Current and Jacks Fork generally which hampered survey and site location in most of those parts of the park; 5) variation in the site locational data which could be

obtained for parts of the park; few documentary data on specific site locations for most kinds of sites were found for the upper Jacks Fork and upper Current; for example, land records were not found for Shannon County, which includes the greatest part of the park; 5) small sample of any one kind of site for which precise locations could be ascertained. Despite the limitations, some preliminary and general locational trends can be noted.

Geographical Variation

The park covers a broad area, encompassing most of the upper Current and much of the middle stretch of the stream and all but the extreme upper Jacks Fork. While some variation in the kinds of sites to be expected or which were found is apparent in the various parts of the park, historical archaeological sites are generally abundant throughout the riverways. There was no part of the park which was found to contain a significantly lesser number of such sites than other geographic areas. Even for the period of early settlement, sites are expected in near equal numbers along the entire stretch of the two streams with the possible exception of the upper Jacks Fork. The lower number of historical archaeological sites actually recorded in the upper Current and Jacks Fork is more likely a result of the dense vegetation and difficult survey conditions than an actually lower number of sites. Few tracts in either low pasture or under cultivation could be found in the upper reaches of the streams and survey was much less effective in locating sites in those areas than in the lower parts of the park.

Landform Associations

The locations of the archaeological sites were recorded with

respect to the landforms as mapped by Saucier on the transparent overlays. Table 3-2 presents the results for certain classes of sites: early to mid-nineteenth century farms and residences, cemeteries, and late nineteenth-early twentieth century farms and residences. The other classes were not considered primarily because of the small sample. Figures are given for archaeologically recorded sites and for reported sites. Not all the reported sites are used in the analysis; only those with very specific locations. The early to mid-nineteenth century reported sites used are those with habitations shown on the General Land Office survey plat. The cemeteries are those shown on the USGS quadrangle maps. The use of the reported sites aids in offsetting the survey biases inherent in the archaeological site data. In some cases, it is not clear whether the landform is a T-3 terrace or low ridge slope; the sixth column includes sites in these situations. There appears to be a general avoidance of the T-2 terrace and floodplain for habitation and cemetery sites. There may be a slightly greater tendency for settlement on the T-3 terrace than on low ridge slopes, but low ridge slope sites are not uncommon. The trend seems to be settlement on the available landform above the frequent flood level, whether terrace or ridge. There is no real change evident in locational preference from the early to late settlement; but this may again be a result of survey bias and the small areas of ridgetop surveyed. Looking at other classes of sites, mills for example are located for the most part along the spring branches; five of the seven documented archaeologically are in such locations. The others are along the major streams. The towns and communities are on the high terraces or low ridge slopes in the major valleys. Roads cross-cut landforms but generally are above the lower

valley locales.

Summary

The above information cannot be used to exclude the possibility or establish a low probability of the presence of historical archaeolocical sites in certain locales. The data suggest that sites are numerous in the park and may be encountered in almost any locale; even on the low or T-2 terraces. Sites in cultivated areas cannot be excluded from those likely to produce significant research data; the testing has demonstrated the opposite. The historical archaeological resource base in the park is rich and varied and the variables influencing site location are complex and as varied as the kinds of sites present.

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1978 History of the upper Current. In Ozark Heritage, Dent County, Missouri, 1851-1978, I, edited by Ken Fiebelman and Harold Hamilton. Dent County Historical Society.

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Wedeymeyer
1862 Letterbook. On file with the Missouri Historical Society, St. Louis.

Table 3-1. Numbers of reported and archaeological historic period sites, Ozark National Scenic Riverways, 1986.

Site Type	No.. Reported	No. Recorded Archaeological Components	
		Certain	Possible
Historic Indian	4	0	0
Early settlement-pre-1860			
pre-1830 farm-residence	6-7	1	1
1830-1860 farm-residence	39	13	3-6
grist and saw mills	15	2	2
towns	1	1	0
stores	7	1	0
tannery-distillery	1	0	0
Civil War			
skirmishes	2	0	0
camps	2	0	0
Cemeteries	33	15	0
Isolated graves	12	0	0
Late 19c-early 20c settlement			
farms-residences	--	22	0
grist and sawmills	10	5	0
communities	4	2	0
rural blacksmith shops	1	1	0
schools	19	4	0
resorts	11	2	1
rural stores	2	0	0
stone walls	0	0	2
fish trips	8	0	1
Late 19c-early 20c lumber industry			
railroads	1	1	0
trams	4	1	0
camps	3	1	0
towns-depots	1	1	0
mills	16	0	0
logyards, tie yards, log booms	8	0	0

Site Type	No. Reported	No. Recorded Archaeological Components	
		Certain	Possible
Undated			
mills	6	2	0
roads	--	4	1
residences	--	8	0
stores	3	0	0
Recent 20c			
residences-farms	--	11	0

[1]most cemeteries probably pre-date ca. 1860s, but continued in use to the late 19th and 20th centuries
[2]documented locations not recorded; expected to be numerous
[3]major segments counted; each may run for many miles
[4]not counted; numerous reported

Table 3-2. Landform locations of selected historic period sites, Ozark National Scenic Riverways.

Site Type	No.	Landform				
		T-2 terrace	T-3 terrace	low slope	ridge top	T-3 low slope
Early to mid-19c farmsteads:						
archaeological	16	1	14	0	1	0
reported	11	2	4	2	0	3
Total	27	3	18	2	1	3
Cemeteries:						
archaeological	12	1	6	2	3	0
reported	9	0	3	3	0	3
Total	21	1	9	5	3	3
Late 19-20c farmsteads:						
archaeological	15	0	4 (1 on tributary terrace)	6	2	2
Totals	63	4	31	13	6	8

SECTION IV

GEOMORPHOLOGICAL STUDIES

Roger Saucier

SCOPE OF REPORT

Yearly progress reports on the geomorphological studies were prepared in May 1982 for the first year (published in February 1983), in June 1983 for the second year (published in April 1984), and in February 1985 (unpublished) for the third year. The present report reflects activities and progress made during the fourth and fifth years of the five-year investigation. Since it represents the final report, it is actually a summary of the entire investigation. In keeping with this, it is not a discussion of activities and events but rather a topically subdivided discussion of major findings and conclusions. Figures and tabulations used in the previous reports are included herein where appropriate for the convenience of the reader in not having to refer to the older documents.

PURPOSE AND SCOPE OF STUDY

The geomorphological investigations were undertaken to provide an understanding of those aspects of the physical environment that may have influenced prehistoric and early historic period settlement and subsistence patterns and other aspects of life. They were undertaken, not as a separate or adjunct study simply to supply data, but rather as an integral and concurrent part of the archeological investigations. Additionally, the geomorphological investigations profited appreciably from contributions from the archeological record, especially as related to developing a regional chronology.

The investigations included landform identification and delineation and paleoenvironmental reconstructions of landscapes as well as development of an understanding of the dominant natural processes

involved. Thus, they focused on temporal and spatial variations in regional hydrology and sedimentation since these were deterministic in the distribution of habitable and arable land, potable water, raw materials, and exploitable flora and fauna. All these are factors critical to human adaptation.

Considering the virtual absence of literature and previous studies on the Quaternary geology and geomorphology of the region, it would have been easy to escalate the level of the investigations by orders of magnitude above what was done. Despite the temptation, they were restricted to achieve a balance with the primary focus of the overall program--the archaeological investigations--in terms of cost, time, and geographic extent. Moreover, when considering the nature of the documents to be produced and the audience to be addressed, it was kept in mind that the intent of all studies was to facilitate cultural resources management and to provide information suitable for interpretive programs. This provided a challenge but in no way was it a limitation.

In terms of methodologies, the geomorphological investigations involved information gathering (both published and unpublished), map and aerial photo interpretation, field reconnaissance, soils sampling and analyses, and radio-metric dating. No subsurface exploration by drilling or trenching was included but observations were made of natural outcrops and exposures and some pits dug for archaeological exploration.

Geographically, the scope of the investigations was limited primarily to the Ozark National Scenic Riverways (ONSR) area. However, to assist in chronostratigraphic determinations, the area of basic landform delineation was extended downstream along the Current River to the Lower Mississippi Valley to tie in with work done previously in that

area.

Temporally, the investigations were restricted to the Quaternary period. This meant that essentially all work focused on the immediate valleys of the Current River and Jacks Fork and the downstream portions of their principal tributaries.

LITERATURE REVIEW

At the beginning of the investigation, it was my belief, based on general familiarity with the region, that there was no technical literature explicitly addressing the Quaternary of this portion of the Ozarks. A comprehensive literature search, coupled with visits to agencies such as the U.S. Geological Survey (USGS), the Missouri Division of Geology and Land Survey (MGS), the U.S. Soil Conservation Service (SCS), the U.S. Forest Service (USFS), and the U.S. Army Engineer District, Little Rock (LRD), confirmed this opinion. Only a few references contain marginally relevant information, such as those concerned with mineral resources (Bridge, 1930), water resources (Maxwell, 1974; Gann, Harvey, and Miller, 1976), springs (Vineyard and Feder, 1974), caves (Bretz, 1956), water quality (Barks, 1978), and regional physiography (Bretz, 1965). Unpublished data of limited value primarily include geological investigations of proposed damsites along the lower Current River (in the files of the LRD), and a compilation of natural resources basic data for the ONSR (in the files of the ONSR headquarters in Van Buren, Mo.).

Geologic literature on the Lower Mississippi Valley is considerably more abundant; however, there are only two references (Saucier and Smith, 1971; Saucier, 1981) that deal directly with the Quaternary geology of the lower Current River. The latter contains a review of

additional literature of marginal relevence to the area.

The Libraries of the University of Missouri at Columbia and at Rolla were searched for theses and dissertations with information on the area. The only references located were geologic mapping of quadrangles or portions of quadrangles that emphasized locations of mineral deposits: none contained information on Quaternary deposits.

INFORMATION SOURCES

Non-literature data collected and analysed for this investigation consisted of maps, aerial photos, historical (ground) photos, and sub-surface data (boring logs). The principal types of data and their sources are summarized below.

The primary map set used for landform delineation and basic data plotting was a series of 1:24,000-scale topographic maps (quadrangles) by the USGS that dated from the 1950s to the 1980s. To evaluate the magnitude of river channel changes, an earlier set of 1:62,500-scale USGS quadrangles dating between 1915 and the 1940s was consulted where available. Additional comparisons were made using township plats dating from the 1840s to the 1860s obtained from the State Land Office in Rolla. Historic maps predating the middle 19th century are few in number and too small in scale to be of value for this purpose. The National Park Service (NPS) was the source of large-scale (1:10,000 or larger) topographic maps of particular campground areas that were of appreciable value in landform delineation and analysis because of their 2-5 contour interval.

The basic set of aerial photos used in the landform delineation was coverage at a scale of 1:20,000 flown by the Agricultural Stablilization and Conservation Service (ASCS) during the period 1968 to

1971. Historic period changes were evaluated and information regarding stream processes was obtained by comparison of these to 1:10,000-scale photos by the ASCS made in 1939. Both index mosaics and individual frames were examined for both sets of photography. Additional photo coverage used consisted of 1:5,000-scale photos of selected campground areas made at various dates by the NPS. Evaluations of the effects of recent major floods on valley landforms were made by comparing the sets previously mentioned with coverage made in 1983 and 1985 at scales of 1:58,000 and 1:80,000 as part of the USGS National High Altitude Photography program. This included both black and white and color infrared coverage.

Historic ground photos were sought as a means of assessing landform changes occurring during the last century. Searches were made to locate relevant photos in the personal collections of local residents and in area libraries and newspaper files, but these were unproductive. Some photos of marginal value were obtained from the USFS office in Rolla and from the State Historical Society of Missouri in Columbia. Other state-agency sources such as the Missouri Department of Conservation were not productive.

Only two forms of existing subsurface data, both meager, were located: one consisted of the logs of about a dozen water wells on file with the MGS and the other included the logs of borings made by the Missouri Highway Department at the sites of major bridges. Similar data available from the LRD were located for areas south of the ONSR and were of limited value for this reason.

DATA PRESENTATION

The Quaternary landforms in the valleys of the Current River and Jacks Fork were classified and delineated throughout the ONSR area on overlays for the 1:24,000-scale USGS quadrangles. The sixteen quadrangles involved are presented as Plates 1-16 delivered in a separate document to the National Park Service. South of the ONSR area, four additional quadrangles were mapped: the overlays for these are included as Plates 17-20 which accompanied the above document. When used in combination with the maps showing site locations, it is possible to directly discern site/landform associations for the entire ONSR area.

LANDFORM MORPHOLOGY AND DELINEATION

A field reconnaissance of the ONSR revealed that the alluvium of the major river valleys is in the form of several discrete terrace levels. These are apparent because of the repeated occurrence of the land surface within discrete elevation ranges above the low water planes of the rivers and by erosional scarps separating these levels with pronounced topographic breaks. The reconnaissance also revealed that the present floodplains of the rivers are topographically distinct from the terraces and hence are separately mappable units of the landscape.

Using the detailed, large-scale NPS topographic maps of campground areas, cross-valley profiles were constructed to develop the physiographic criteria on which to recognize the landforms. Examples of three of the profiles are shown in Figure 4-1. With these criteria, and despite the limitations of the 20-foot contour interval of the USGS quadrangles, it was then possible to areally delineate and correlate the landforms. Aerial photos were of value since there are consistent diagnostic differences in land use and vegetation types among the

several landforms present.

A tentative landform classification was developed during the first year of the investigation. In the second year, the classification and associated mapping were field checked and tested with adjustments and refinements made where necessary. This led to the delineation of numerous terrace outcrops too small to be recognized on the maps and aerial photos. The elements of the final classification are described below.

The classification includes the active floodplains of the rivers plus three discrete terrace levels. The floodplains are hummocky to undulating surfaces that generally lie within 10 feet of river level (low water plane) but that might be as high as 20 feet above that level. Surface morphology is a product of both deposition and erosion (scouring) during overbank flooding and there is a generally preferred alignment of features (ridges, knolls, swales) parallel to the trend of the overall valley. Since the depositional processes are analogous to those that create natural levees, there is a strong tendency for the floodplains to be highest near active channels and to slope sharply away towards the valley sides.

The floodplains have been arbitrarily divided into two units, designated T_0 and T_1 (Figure 4-1). The T_0 unit represents that part of the floodplains known to have been created by lateral movement of the rivers since the middle 19th century as documented by the topographic maps. The T_1 is morphologically similar but represents deposition during a period of unknown (and probably variable) length extending beyond the historic period into the late Holocene.

In the ONSR area, the T_1 unit includes numerous short segments of

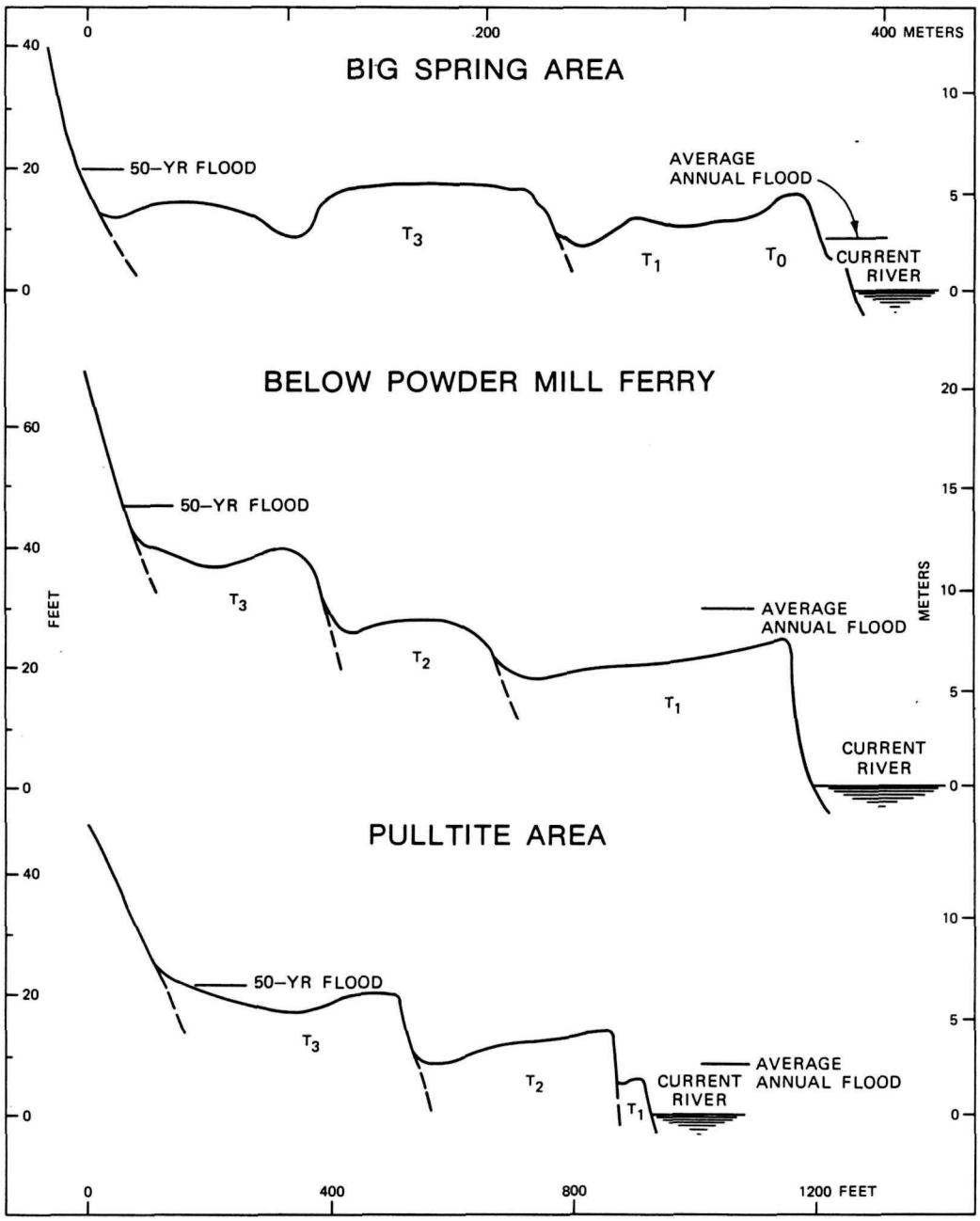


Figure 4-1. Typical cross-valley profiles of the Current River show distribution of landforms in relation to flood heights.

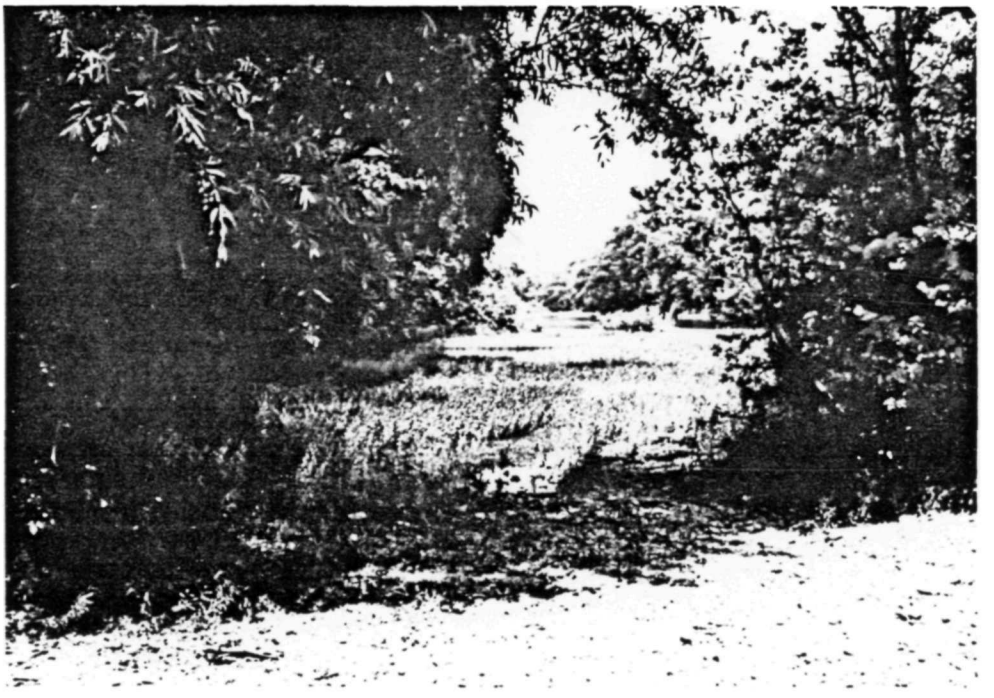


Figure 4-2. Abandoned chute of the Current River near the valley margin in the vicinity of Powder Mill Ferry.

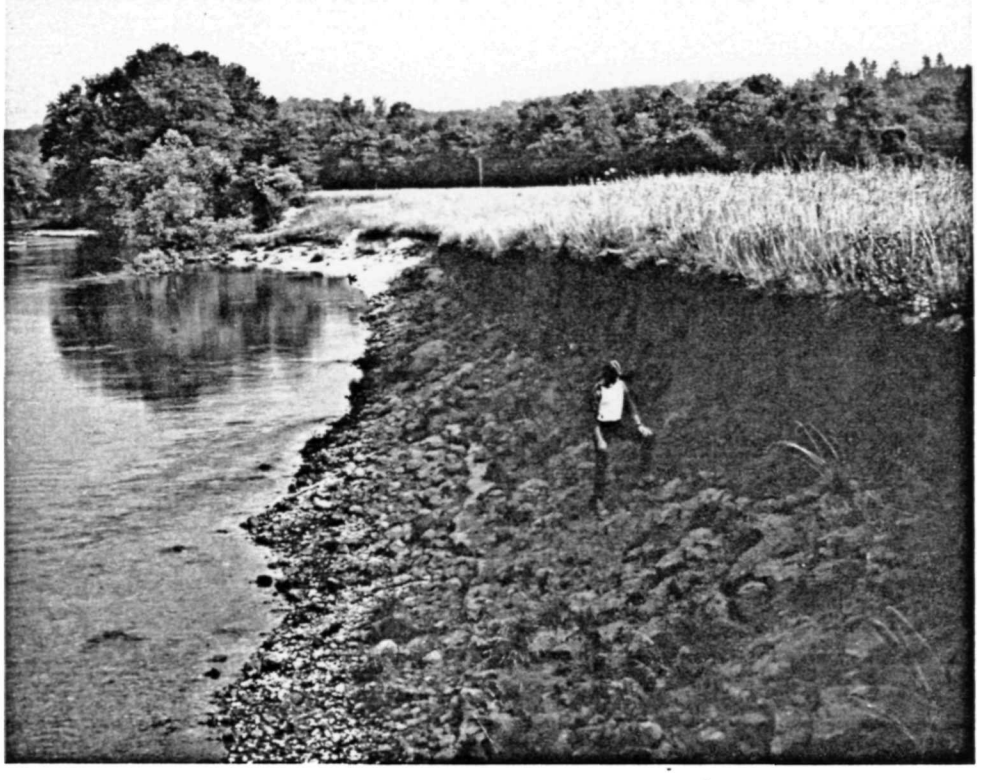


Figure 4-3. A typical exposure of the T_3 terrace along the Current River south of Van Buren.

abandoned chutes and swales, usually present at the bases of the scarps marking the landward limits of the floodplains (Figure 4-2). South of the ONSR area where the river has been able (because of increased valley width) to meander freely, the T_1 unit contains occasional neck and chute cutoffs of meander bends.

The lowest of the three discrete terrace levels is designated T_2. This terrace characteristically lies 10 to 20 feet above low water level and often has 10 feet or more of relief on its surface. Like the T_1 floodplain unit, it generally slopes in a direction away from the river channel but surface features are more subdued. Nevertheless, linear swales and chutes usually occur between the T_2 terrace and the next higher terrace or the uplands, whichever may be present, resulting in a pronounced scarp separating the levels. These chutes are active during times of flooding when the floodwaters seek shorter downstream paths and they usually convey local drainage from the higher levels (surface runoff and spring and seep discharges) at other times.

South of the ONSR area where the Current River valley widens significantly as it approaches the Lower Mississippi Valley, the T_2 terrace becomes areally dominant and contains numerous cutoff meanders and short segments of abandoned courses. Eventually, it merges with a broad alluvial fan that extends into the Western Lowlands segment of the Mississippi Valley. On the fan are a series of abandoned meander belts of the Current River. These are important features from a paleo-environmental standpoint since they show evidence of significant variations in river discharge (Saucier, 1981) and they are factors to be considered in establishing a terrace chronology, as is discussed later in this report.

The T_3 terrace level attains elevations of 20 to 40 feet above low water levels and is similar to the T_2 level in most respects except that it has less relief and less surface variation (Figure 4-3). In general, it constitutes the flattest tracts of land in the ONSR area. Except for major swales, local relief is usually less than 5 feet. This flatness is a reflection of a relatively greater accumulation of overbank sedimentation from floods than on the lower level. Accumulation has been in small increments since the terrace is inundated only by the highest floods in the valley and away from the areas of maximum turbulence and sediment load. As indicated in Figure 4-1, even the T_3 level is inundated by floods with a return frequency of less than 50 years.

Reflecting both the flatness and the relative infrequency of flooding, the T_3 level characteristically has been cleared for agriculture and generally is the most intensely used landforms of the region. In contrast, the T_2 level is occasionally cultivated whereas the T_0 and T_1 units of the floodplain almost never are used for this purpose. The latter are characteristically forested.

Because the valleys of even the Current River and Jacks Fork are narrow, averaging less than 1000 feet wide, the rivers do not meander per se, but instead often shift from one side of the valleys to the other and impinge against the valley walls. As a consequence, the terraces seldom are equally present on both sides of the river at a given location and hence occur in contiguous segments often no more than a few hundred acres in extent and usually much less. Figure 4-4, showing the delineation of landforms for two areas of the Current River on 1:20,000 original-scale aerial photos, illustrates the general pattern of terrace level occurrence in the ONSR area.

The T_4 terrace level has been identified at only a few localities between Van Buren and Doniphan, Mo. Its surface lies 60 or more feet above the low water plane of the Current River. Because of its limited extent and small areas of exposure, little can be said about its surface morphology.

In the ONSR area, there are several dozen minor tributaries of the Current River and Jacks Fork that are large enough to have small floodplains. Only a few of these have been examined in detail and on those it appears that the tributary floodplains are graded to (i.e., merge with) the T_3 terrace level. Consequently, the tributaries per se are slightly entrenched into the floodplains near their confluences with the larger streams. In some other cases, the tributary floodplains seem to merge with the floodplains of the larger streams. Complicating the mapping in these situations has been the large amount of late historic period gravel fill and aggradation due to upland erosion prompted by widespread timber cutting.

LANDFORM LITHOLOGY AND STRATIGRAPHY

Examinations of outcrops and the few boring logs available revealed that all landforms are typical fluvial depositional sequences. They have a course-grained substratum of sand and gravel overlain by a topstratum of much finer sediments. The former represent channel and bar deposits while the latter represent overbank flood deposits. Channel and bar deposits are mostly due to lateral sedimentation while overbank flood deposits are due to vetical sedimentation.

Below the low water planes of the rivers, the substratum deposits of all landforms consist of 5 to 20 feet of mostly sands and gravels. These fill irregular scoured depressions in the underlying bedrock and

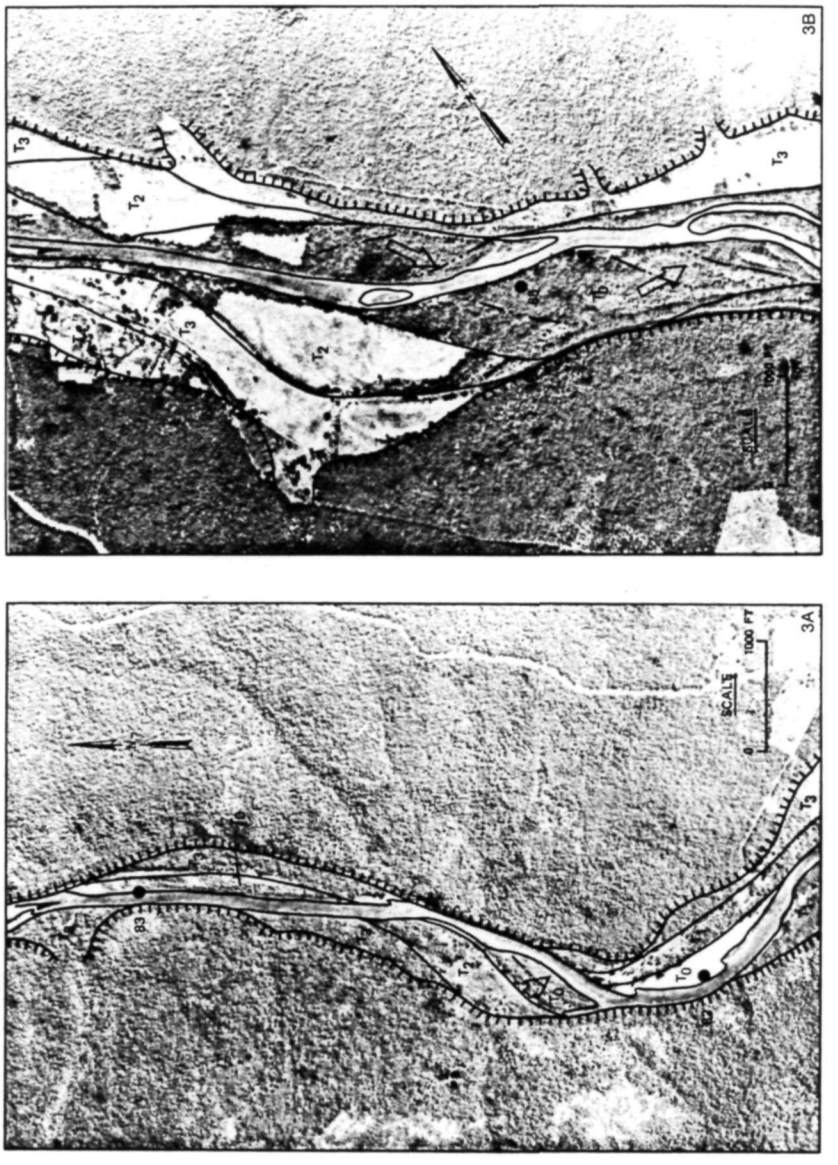


Figure 4-4. Exemplary delineation of landforms on 1:20,000 original-scale aerial photos.

are highly variable in thickness and composition. Beneath the present river channel, the deposits are partially to wholly reworked during major floods but provide a bedrock armor at other times.

The topstratum of the T_0 and T_1 floodplain units is composed mostly of brown to grayish brown silty and sandy loams, but somewhat anamalous surface conditions often suggest otherwise. Immediately adjacent to active stream channels, there are numerous gravel-covered point bars and mid-channel bars that are exposed at low water. In addition, there are shallow layers and tongues of gravels and cobbles adjacent to the main stream channels that were deposited by major floods during the last century. Many of them are attributable to floods of the last decade. These coarse-grained deposits are a direct result of man-induced changes in river regimes during historic times and are not characteristic of deposits laid down during prehistoric times.

The graveliferous substratum of the T_2 and T_3 terraces typically does not extend higher than 5 to 8 feet above the low water planes and has not been observed to contain cobble-size materials at any point (Figure 4-5). Hence, the gravel-cobble bars of the present floodplain have no recognized geologic counterpart.

Table 4-1 contains information on the color and textural classificatioin of typical T_2 and T_3 terrace topstratum soil profiles. In terms of composition, the two terraces are quite similar, but the T_3 terrace deposits are slightly finer grained and perhaps average 50 percent thicker. In fresh exposures, the T_3 terrace deposits are distinctively yellower in color, suggesting a higher degree of oxidation. The color difference is not well evidenced by the data in Table 1, however.

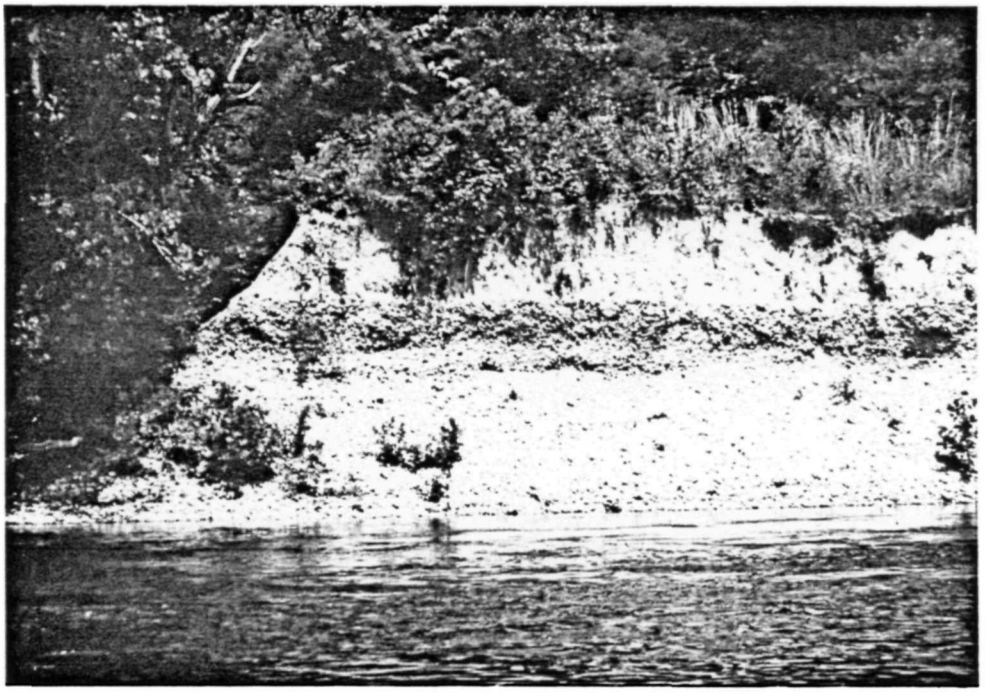


Figure 4-5. Graveliferous substratum overlain by finer-grained topstratum deposits in a T_3 terrace outcrop along the Current River at Cataract Landing.

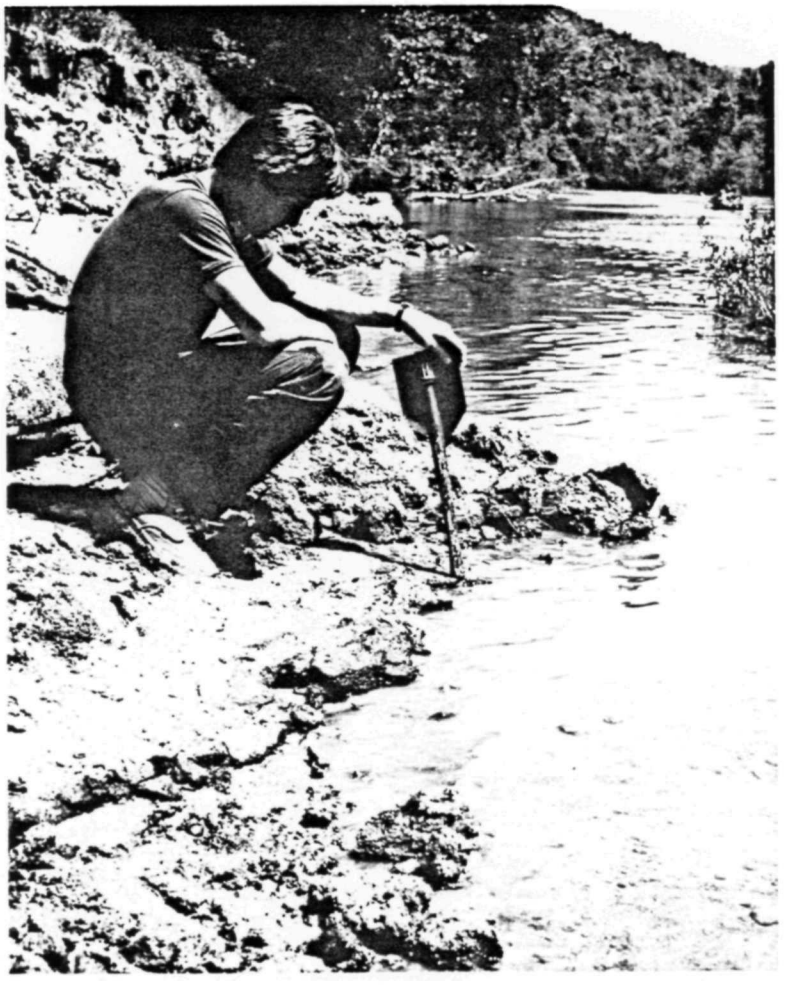


Figure 4-6. Lens of organic clay exposed at the base of a T_2 terrace at Powder Mill Ferry.

Sample 83-1. Current River Valley, T_2 terrace 1.7 miles below Two Rivers

Shannon Co., Mo., NW¼ NW¼ SW¼ T29N R3W
37°10'53" N. Lat., 91°15'04" W. Long.

SAMPLE NO.	DEPTH (FT)	MUNSELL COLOR	COLOR NAME	% SAND	% SILT	% CLAY	TEXTURE
83-1-1	2.0	5YR 3/1	Very dark gray	12.4	50.8	36.8	Silty clay loam
83-1-2	4.0	5YR 4/2	Dark reddish gray	18.4	44.8	36.8	Silty clay loam
83-1-3	6.0	5YR 3/2	Dark reddish brown	20.4	42.8	36.8	Clay loam
83-1-4	8.0	7.5YR 4/4	Dark brown	74.4	10.8	14.8	Sandy loam
83-1-5	10.0	10YR 4/2	Dark grayish brown	66.4	12.8	20.8	Sandy clay loam

Sample 83-2. Jacks Fork Valley, T_3 terrace 2.2 miles downstream from Eminence

Shannon Co., Mo., SW¼ NE¼ SW¼ S24 T19N R4W
37°10'01" N. Lat., 91°20'16" W. Long.

SAMPLE NO.	DEPTH (FT)	MUNSELL COLOR	COLOR NAME	% SAND	% SILT	% CLAY	TEXTURE
83-2-1	0.5	10YR 5/3	Brown	30.4	48.8	20.8	Loam
83-2-2	2.0	10YR 5/6	Yellowish brown	24.4	38.8	36.8	Clay loam
83-2-3	4.0	10YR 6/8	Brownish yellow	16.4	46.8	36.8	Silty clay loam
83-2-4	6.0	10YR 6/6	Brownish yellow	28.4	38.8	32.8	Clay loam
83-2-5	8.0	10YR 5/4	Yellowish brown	52.4	22.8	24.8	Sandy clay loam
83-2-6	10.0	10YR 5/4	Yellowish brown	34.4	38.8	26.8	Loam
83-2-7	12.0	7.5YR 4/4	Dark brown	26.4	48.8	24.8	Loam
83-2-8	14.0	10YR 4/4	Dark yellowish brown	42.4	32.8	24.8	Loam

Sample 83-3. Current River Valley, T_3 terrace 3.1 miles upstream from Powder Mill Ferry

Shannon Co., Mo., SE¼ SE¼ SE¼ S13 T19N R3W
37°10'34" N. Lat., 91°13'00" W. Long.

SAMPLE NO.	DEPTH (FT)	MUNSELL COLOR	COLOR NAME	% SAND	% SILT	% CLAY	TEXTURE
83-3-1	2.0	7.5YR 5/6	Strong brown	68.4	16.8	14.8	Sandy loam
83-3-2	4.0	7.5YR 5/6	Strong brown	48.4	20.8	30.8	Sandy clay loam
83-3-3	6.0	7.5YR 4/4	Dark brown	46.4	32.8	20.8	Loam
83-3-4	8.0	7.5YR 4/4	Dark brown	54.4	26.8	18.8	Sandy loam
83-3-5	10.0	10YR 4/4	Dark yellowish brown	30.4	42.8	26.8	Loam
83-3-6	12.0	7.5YR 4/6	Strong brown	46.4	26.8	26.8	Sandy clay loam

Table 4-1. Physical soils analyses on samples of terrace deposits (topstratum only).

SOIL ANALYSIS REPORT

SAMPLE NUMBER	LAB NUMBER	ORGANIC MATTER % RATE	ORGANIC MATTER ENR lbs./A	PHOSPHORUS P_1 (Weak Bray) ppm P RATE	PHOSPHORUS P_2 N_aHCO_3-P ppm P RATE	POTASSIUM K ppm K RATE	MAGNESIUM Mg ppm Mg RATE	CALCIUM Ca ppm Ca RATE	SODIUM Na ppm Na RATE	pH SOIL pH	pH BUFFER INDEX	HYDROGEN H meq/100g	Cation Exchange Capacity C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED) % K	% Mg	% Ca	% H	% Na
1-1	02563	1.9	82M	36 VH	50 H	100 M	431 VH	1520 M		6.9		0.2	11.6	2.2	31.0	65.5	1.7	
1-2	02564	1.5	74L	30 VH	43 H	108 M	439 VH	1330 M		7.2		0.0	10.8	2.6	33.8	63.7	0.0	
1-3	02565	1.3	70L	25 H	33 M	99 M	442 VH	1280 M		7.3		0.0	10.3	2.5	35.6	61.9	0.0	
1-4	02566	0.4	50VL	15 M	17 L	42 L	168 VH	420 M		7.3		0.0	3.6	3.0	38.8	58.2	0.0	
1-5	02567	0.4	50VL	13 L	17 L	39 L	213 VH	530 M		7.4		0.0	4.5	2.2	39.2	58.6	0.0	
2-1	02568	1.6	76L	5 VL	6 VL	62 L	216 VH	540 M		7.0		0.0	4.7	3.4	38.3	57.4	0.0	
2-2	02569	0.8	60L	13 L	17 L	95 M	145 VH	640 M		5.9	6.9	1.0	5.7	4.3	21.2	56.1	17.5	
2-3	02570	0.7	57VL	11 L	18 L	101 M	208 VH	640 M		5.9	6.9	1.1	6.3	4.1	27.5	50.8	17.5	
2-4	02571	0.7	57VL	11 L	16 L	88 M	164 VH	530 L		5.6	6.8	1.3	5.5	4.1	24.8	48.2	23.6	
2-5	02572	0.9	62L	12 L	16 L	65 M	122 VH	400 M		5.7	6.9	0.8	4.0	4.2	25.4	50.0	20.0	
2-6	02573	0.5	52VL	4 VL	6 VL	102 H	267 VH	350 L		5.8	6.9	1.0	5.2	5.0	42.8	33.7	19.2	
2-7	02574	0.5	52VL	2 VL	7 VL	78 M	315 VH	450 L		6.1	6.9	0.8	5.9	3.4	44.5	38.1	13.6	
2-8	02575	0.4	50VL	3 VL	5 VL	79 M	299 VH	600 M		7.0		0.0	5.7	3.6	43.7	52.6	0.0	
3-1	02576	0.4	50VL	45 VH	47 H	44 M	123 VH	160 L		5.9	7.0	0.4	2.3	4.9	44.6	34.8	17.4	
3-2	02577	0.5	52VL	19 M	23 M	46 L	130 VH	250 L		5.2	6.8	1.2	3.6	3.3	30.1	31.9	33.3	
3-3	02578	0.3	47VL	12 L	14 L	45 L	191 VH	310 L		5.3	6.8	1.5	4.8	2.4	33.2	32.3	31.3	
3-4	02579	0.4	50VL	14 M	17 L	48 L	186 VH	310 L		5.7	6.9	0.9	4.1	3.0	37.8	37.8	22.0	
3-5	02580	0.5	52VL	11 L	24 M	58 L	257 VH	480 L		5.4	6.7	1.9	6.6	2.3	32.4	36.4	28.8	
3-6	02581	0.4	50VL	7 L	9 L	72 L	362 VH	790 L		6.1	6.8	1.2	8.4	2.2	35.9	47.0	14.3	

Table 4-2. Chemical soils analyses on samples of terrace deposits. Samples 1-1 to 1-5 are from a T_2 terrace and samples 2-1 to 2-8 and 3-1 to 3-6 are from a T_3 terrace.

Agricultural soil analyses were performed on a total of 19 samples obtained from one T_2 terrace outcrop and two T_3 terrace outcrops (Table 4-2). While the data are few and there is a slight chance of contamination from nearby cultivated areas where fertilizers may have been used, they do indicate the T_3 terrace sediments are less organic, more heavily leached, and more acidic than the T_2 terrace sediments. These differences are logical in view of the relatively greater age of the T_3 terrace.

The finest grained deposits in the ONSR area occur as thin layers of organic-rich clays in the deeper and more sheltered swales and abandoned chutes. The chances that such deposits will be preserved and become part of the stratigraphic record are slim, but apparently this does sometimes occur. Several-inch-think layers of clays with abundant organic debris such as leaves, twigs, nuts, and seeds were encountered at or slightly above the low water planes at several locations along the Current River (Figure 4-6). Extending laterally beneath the T_2 and T_3 terrace levels for several tens of feet, they definitely suggest deposition in shallow swales. They are immediately underlain by gravels and immediately overlain by topstratum deposits. As discussed later in this report, these deposits were radiocarbon dated in an attempt to establish a chronology of terrace formation.

ANALYSIS OF REGIONAL TRENDS

After the delineation of the Quaternary landforms was completed, regional trends in measurable morphological parameters were analyzed to better define the causal processes and to discern differences of possible significance to prehistoric inhabitants. Most of these relate to downvalley (longitudinal) trends as discussed below.

The total width of the Quaternary valley of Jacks Fork varies by several hundred feet, but it averages about 1200 feet and there is no discernible longitudinal trend. In contrast, the valley of the Current River steadily increases from an average width of about 400 feet near Montank, MO., to about 1500 feet at Gooseneck (the southern limit of the ONSR). Below this point, it rapidly widens within several miles to nearly 3000 feet in the vicinity of Doniphan and to over a mile where it enters the Lower Mississippi Valley.

While the narrow valley width locally inhibits free migration of the river channel, other factors must also be important because the sinuosity of the Current River does not increase downvalley in response to increasing valley width. Rather, it remains constant at about 1.1 to a point near Gooseneck and only then markedly increases to about 1.3 near Doniphan. Valley slope apparently is not a factor since there are no abrupt changes in gradient--the valley slope steadily declines downstream from about 8 feet per mile near Akers Ferry, Mo., to about 3 feet per mile near Doniphan. Perhaps, variations in sediment load (both volume and grain size) are responsible for the change in sinuosity.

The distribution or relative abundance of the landforms within the valleys is significant since this had a direct influence on where prehistoric populations could have lived. Table 4-3 provides data on

Landform	Percent of Total Valley Area	
	Current River	Jacks Fork
Floodplain (T_0 unit)	13	24
Floodplain (T_1 unit)	52	43
T_2 terrace	17	12
T_3 terrace	18	21
T_4 terrace	<1	0

Table 4-3. Distribution of Quaternary Landforms.

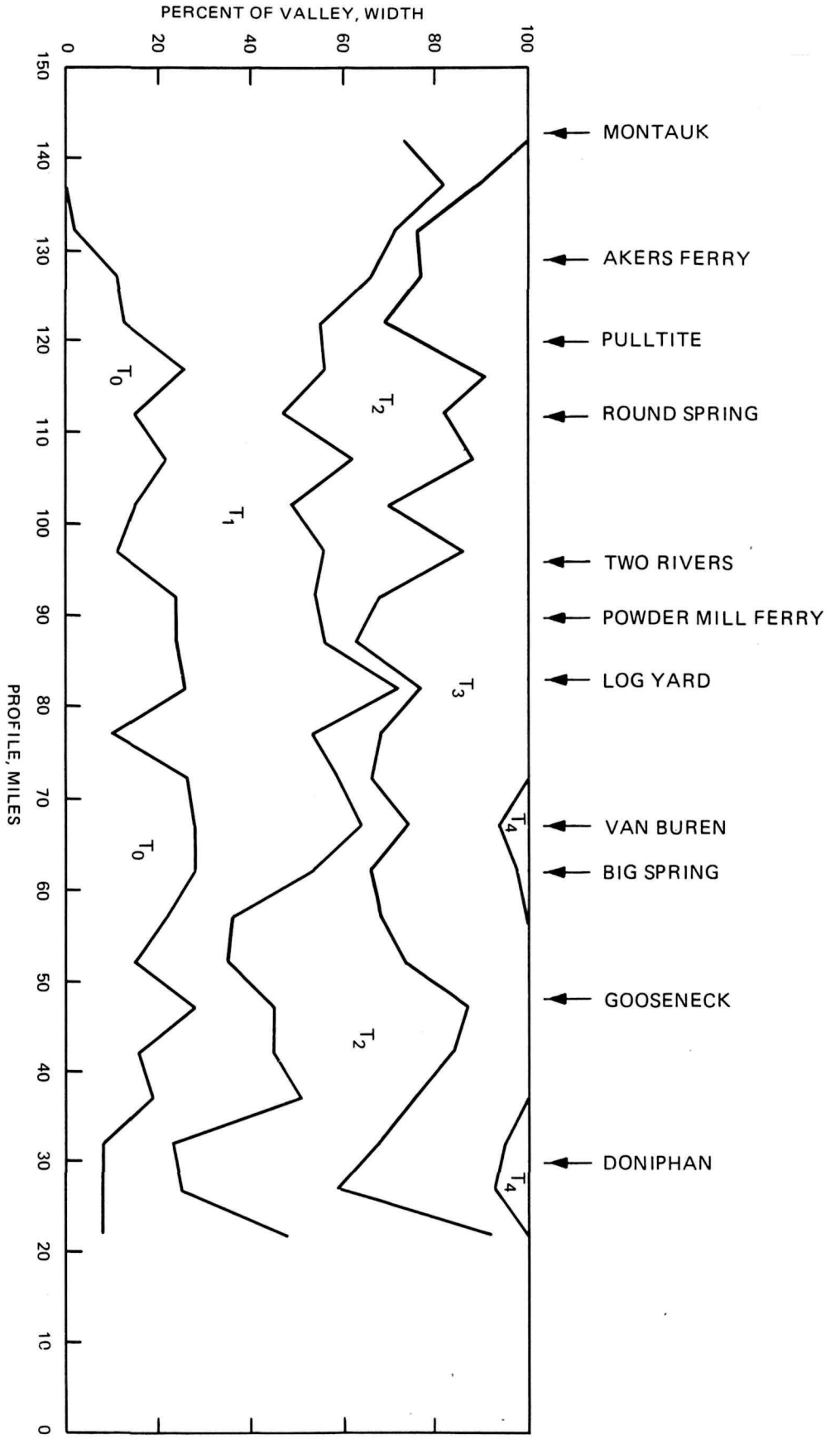


Figure 4-7. Longitudinal distribution of landforms along the Current River.

the overall situation.

An important observation that can be made from this tabulation is that approximately two-thirds of both valleys is occupied by floodplain. The one-third occupied by terraces is composed of the T_2 and T_3 levels in nearly equal porportions except on the Jacks Fork where the T_3 is areally predominant.

Figure 4-7 shows that, within this overall pattern of distribution, there are significant longitudinal trends. For example, along the Current River, there is a marked, progressive downvalley increase in the amount of the valley occupied by terraces from about 20 percent in the vicinity of Montauk to about 60 percent in the vicinity of Gooseneck. This trend is directly attributable to a corresponding progressive downvalley decrease in the extent of historic and late prehistoric period channel migration as indicated by the T_0 and T_1 floodplain units.

Figure 4-7 also shows that there is less variation, both locally and regionally, in the distribution of the T_3 terrace level than any other landform. On the basis of five-mile running averages of measurements made at one-mile intervals, it constitutes no less than about 10 percent and no more than 40 percent of the valley width below Akers Ferry. In contrast, the T_2 terrace level is locally more variable. Between Power Mill Ferry and Big Spring, Mo., it is very poorly represented whereas it becomes areally dominant below Big Spring.

STREAM CHANNEL PROCESSES AND PATTERNS

There is a definite causal relationship between the particular process of channel migration present in the ONSR area and terrace formation; hence, the former must be described before the latter can be understood.

Besides the influence of the narrow valleys on the ability of the streams to shift laterally, another major factor influencing stream behavior is the essential inerodability of the underlying bedrock, at least in time frames measured in thousands of years. Throughout most of the Quaternary, the streams have flowed on bedrock armored with a thin veneer of gravel and they have probably not degraded this level by more than a few feet. Therefore, the streams cannot deepen their channels during times of major floods nor can they aggrade and degrade their valleys in response to cyclical changes in discharge induced by climatic change.

Observations in the field and on the aerial photos of peculiar stream characteristics such as variations in floodplain width, directions and rates of lateral bar growth, locations of abandoned chutes, and the tendency of the active channels to hug the sides of the valleys led to recognition of the dominant fluvial processes and the development of a stream response model.

The dominant factor in stream channel patterns and behavior is the relative abundance of a supply of sand and gravel to create bars. Variations in the rates and directions of bar growth cause changes in the rates and patterns of lateral channel migration. These, in turn, influence rates and patterns of bank caving and erosion.

Until the middle of the 19th century, the dominant bed load of the rivers was composed of sand with small to moderate amounts of gravel. For reasons not yet understood, along all rivers there were reaches up to several miles in length where these materials essentially were not deposited. In a recent paper, Saucier (1983) described these reaches and pointed out that they have been observed on other streams and they

have been called transport zones. In these zones, which have formed at different locations during geologic times, the river channels are highly stable with very little lateral movement.

Between the transport zones are sedimentation zones where the bed load of the rivers is temporarily stored during low water in lateral and mid-channel bars. During floods, some of the material is picked up and moved downstream through one or more transport zones to another sedimentation zone. As would be expected, the sedimentation zones are areas of channel instability and where much if not all of the terraces have been removed by erosion. In the ONSR area, 13 of these zones have been recognized between a point several miles above Round Spring and Gooseneck and there are four others farther downstream (Figure 4-8).

Depending on the relative amount of sand and gravel in the sedimentation zones, one of two types of patterns may be present. Where the amount is moderate, lateral bars will repeatedly form, causing the channel to progressively shift in a generally downstream direction. This results in a diagnostic form of accretion as illustrated by Figure 4-9. In this figure, the arrows point in the direction of bar growth and the dot-dash lines indicate former banklines.

Where the amount of sand and gravel is large, a similar form of lateral bar growth will occur, but the process of downstream migration of individual bends will be repeatedly interrupted by chute cutoffs. Figure 4-10 illustrates stages in a typical sequence. The difference between this pattern and the one described above is attributable to the rate of bar growth. In the pattern where a cutoff eventually occurs (Figure 4-10), a point bar grows at such a rate as to cause a sharp inflection in a bend in the channel and therefore an increase in channel

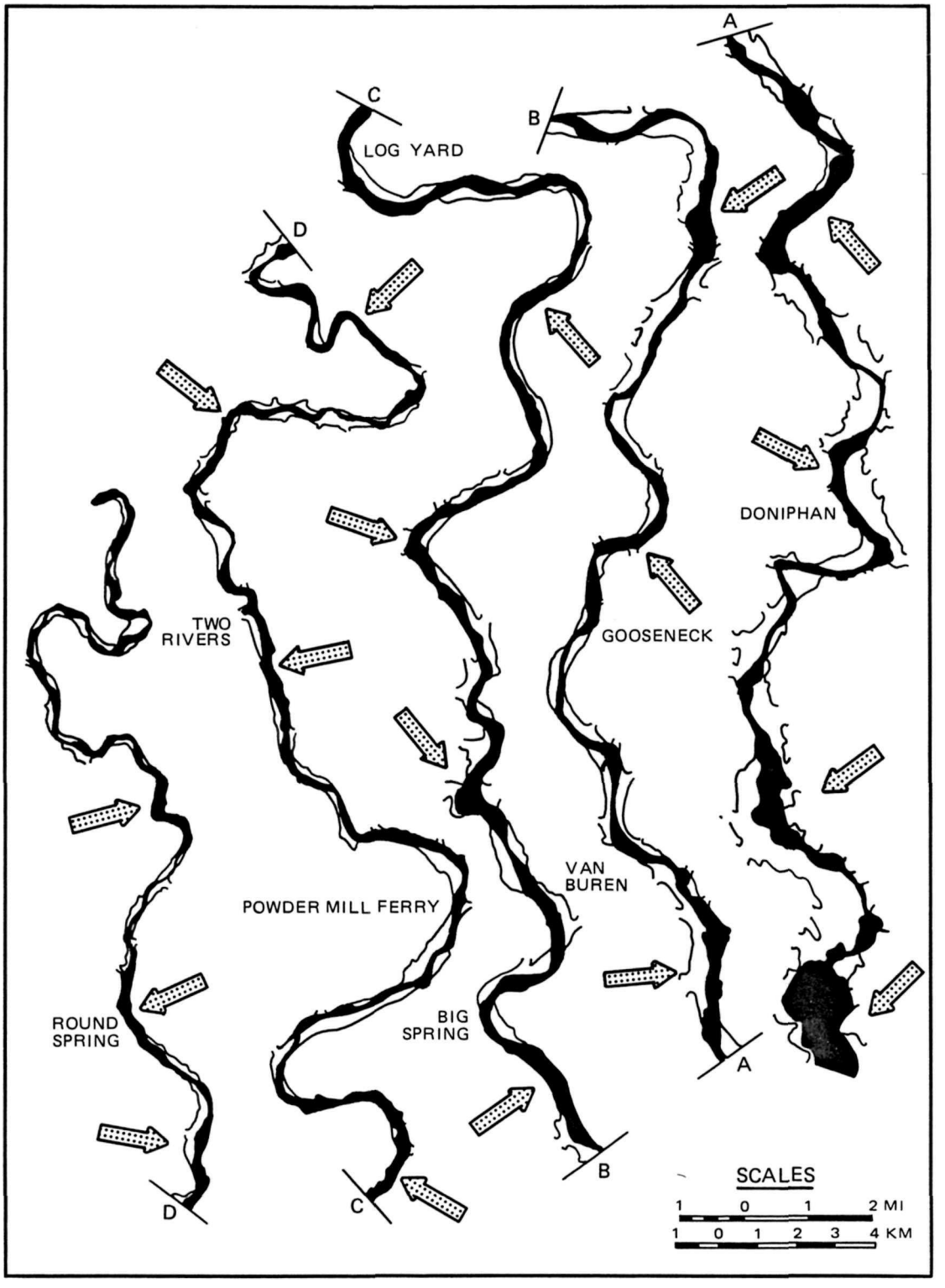


Figure 4-8. Locations of sedimentation zones along the Current River.

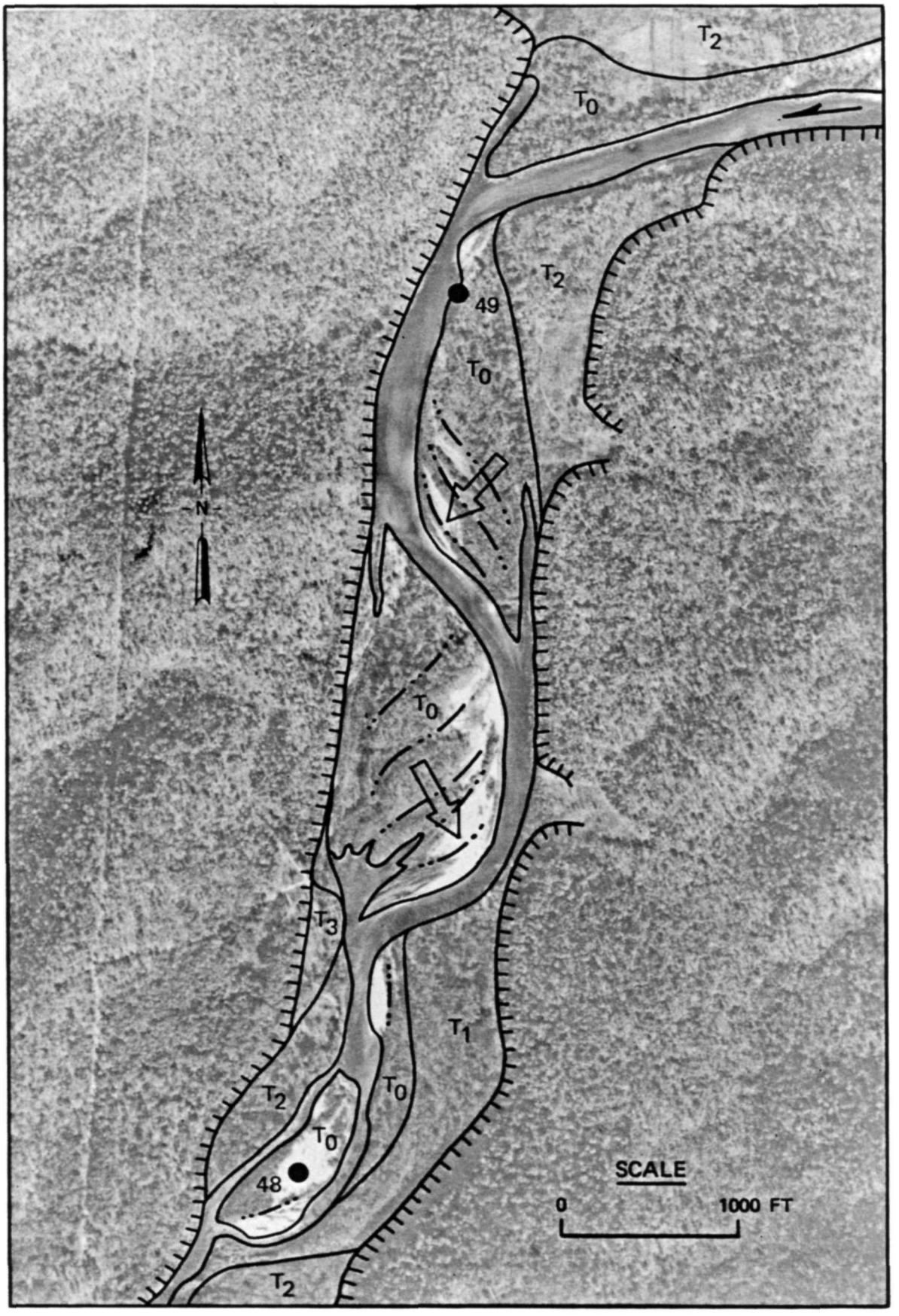
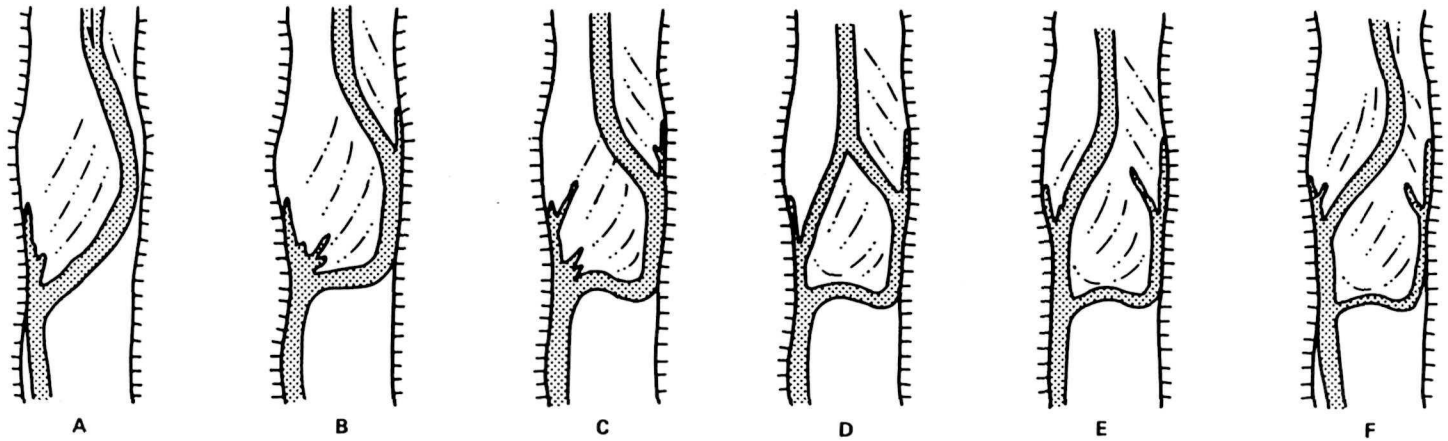


Figure 4-9. Aerial photo of active accretion in a sedimentation zone along the Current River in the vicinity of Gooseneck.



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Figure 4-10. Idealized sequence showing a typical pattern of chute formation in sedimentation zones.

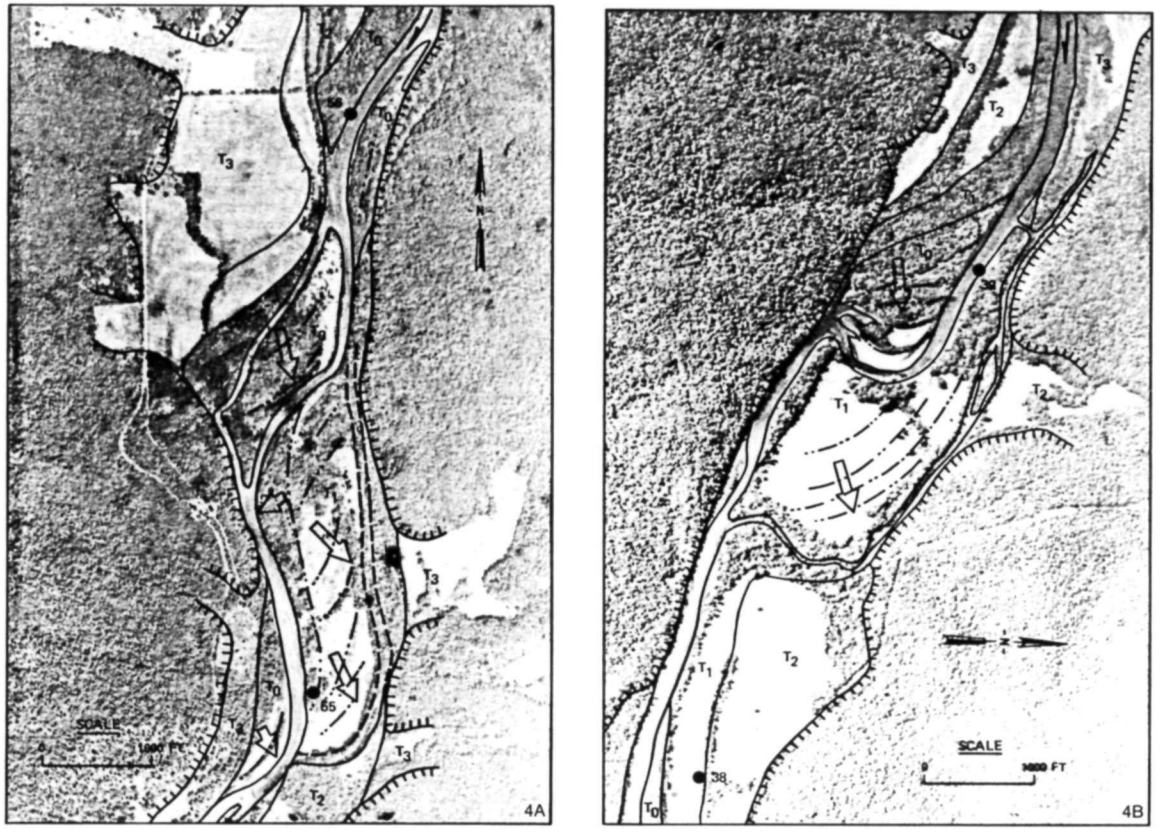


Figure 4-11. Aerial photo views of chute cutoffs in sedimentation zones along the Current River.

length and a decrease in gradient. This favors a shorter, steeper route across the bar farther upstream through which the stream may divert during a single major flood. Once a diversion takes place, the newly formed channel begins cutting into the older bar deposits as it begins to migrate downvalley. Before long, the stage is reset for another diversion through an older chute or across the point bar. Figure 4-11 illustrates two examples of this pattern in sedimentation zones located between Big Spring and Gooseneck (4A) and between Gooseneck and Doniphan (4B) on the Current River.

MODEL OF TERRACE FORMATION

The particular mode of terrace formation postulated for the ONSR area is based on the assumption (as is discussed later) that the terraces represent a period of time measured in tens of thousands of years. Consequently, the streams that produced them must have responded to climatic changes that affected the entire Ozark Plateau region during the Late Wisconsinan Stage and the Holocene. Therefore, the model set forth below is based on a general knowledge of the nature of typical fluvial responses to climatic change, tempered with specific knowledge of the lithology and stratigraphy of the ONSR area terrace sequence.

Some terrace sequences are explainable in terms of increases and decreases in discharges caused by changes in absolute precipitation, or effective precipitation (combined effects of temperature and precipitation changes). However, this appears to be inadequate to explain the situation in the ONSR area. Increased discharges alone would not have caused stream instability, and decreased discharges would not have led to floodplain aggradation of the type that caused terrace levels to form

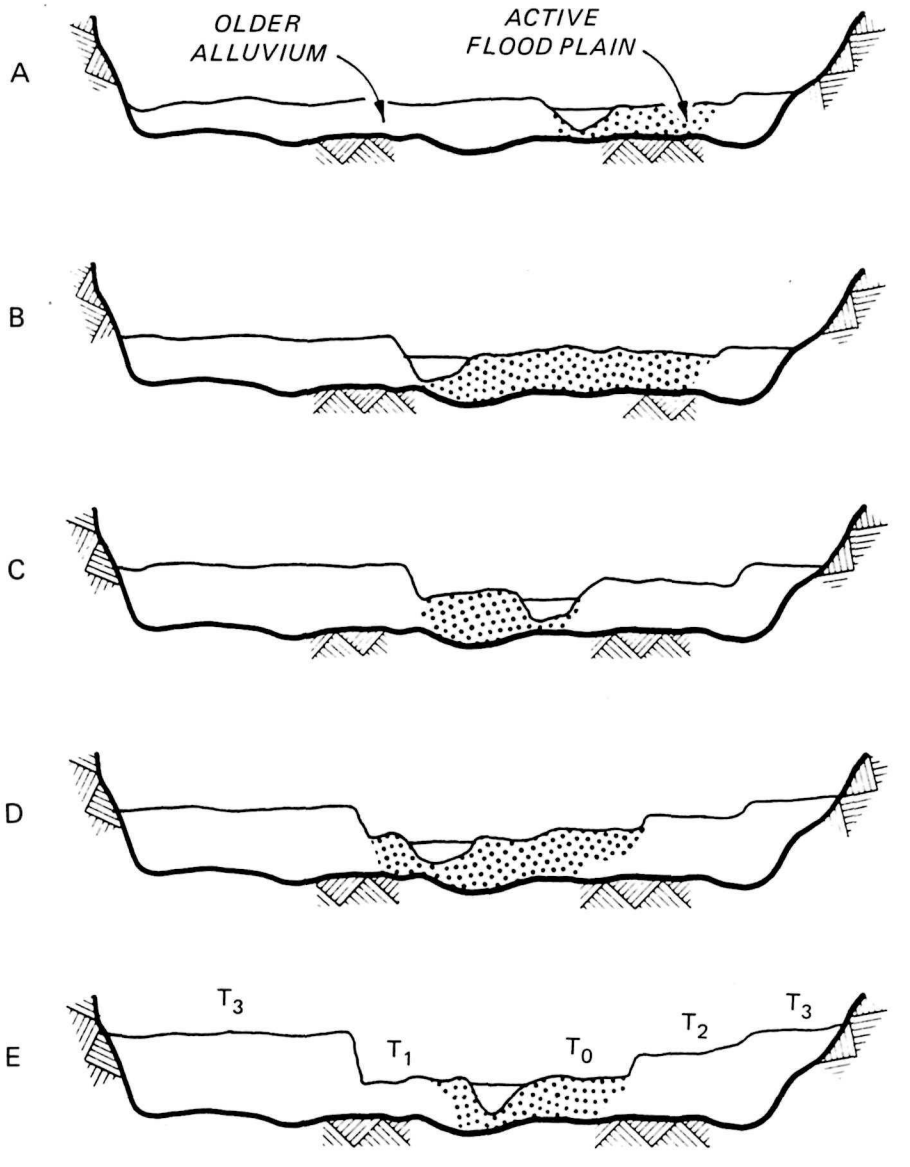


Figure 4-12. Idealized stages in a terrace formation sequence along the Current River.

as they did. Consequently, the proposed model relies heavily on the probability that changes in the frequency and intensity of storminess, leading directly to changes in flood frequency and magnitude, were relatively more important. Such changes and their effects on streams have been documented by Knox (1982) for areas in the Midwestern United States. In some but not all cases, increased precipitation intensity was coincident with overall wetter climatic conditions. A possible chronology of such changes is proposed in the next section of this report.

The terrace formation model is best described using a five-stage scenario illustrated by Figure 4-12. Stage A represents the onset of a period of channel stability, coincident with a period of relatively low precipitation intensity and reduced flooding frequency. This followed a stage of instability in which all existing valley landforms had been destroyed by lateral channel migration. During Stage A, the active floodplain was narrow and the older floodplain (analogous to the T_1 level) was relatively low in elevation, but was slowly aggrading through the addition of fine sediments during infrequent floods.

Stage B represents a period of instability caused by relatively higher precipitation intensities and an increased incidence of major floods. At this time, the active floodplain widened, cutting laterally into some of the older floodplain that had aggraded to a higher elevation. This marked the initial stage in formation of the T_3 terrace.

Stage C represents the return of a period of channel stability with reduced flooding frequency. Parts of what had been the active floodplain during Stage B were now aggrading at a moderate rate through

the periodic addition of sediments during times of overbank flooding. This was the beginning of the formation of the T_2 terrace. At the same time, the T_3 terrace level was also aggrading, but at a slower rate since it was receiving less sediments during floods (because of its increased elevation) and it was being inundated less frequently than the T_2 level.

Stage D marks the return of another period of channel instability, increased flooding frequency, and corresponding widening of the active floodplain. There was probably some continued aggradation of both the T_2 and the T_3 terraces during this stage; however, the significant process would have been the erosion and destruction of portions of both terraces due to increased lateral movement of the stream channel. One effect of this was accentuation of the scarps separating the various terrace levels.

Stage E essentially represents modern conditions within the Current River valley. The present is a period of relative channel stability although not to the extent of similar periods in prehistoric times due to changes brought about by the introduction of large amounts of gravel during the late 19th and early 20th centuries. The T_2 and T_3 terrace levels are still continuing to aggrade but at a very slow rate and not in a consistent pattern. Presistent aggradation of the terraces is thought to be strongly promoted by if not actually dependent on the presence of a forest cover. Tree stands slow current velocities in flood waters which allows suspended sediment to be deposited. Since large areas of both terraces are now cleared, little sediment accumulation and perhaps even some erosion (scouring) during normal floods may be taking place in many areas. However, since present land use is such

that the T_1 unit of the floodplain (as well as most of the T_0 unit) is densely wooded, deposition and aggradation are the dominant processes away from the active stream channel.

Following the logic used in this model, it could be argued that at some time in the future, all terraces should aggrade to some common level determined by the highest floods that could occur. However, in a practical sense, this is not likely to occur. Archaeological sites located on the terraces, largely unstratified surficial features, attest that the terraces already are at an elevation where the rates of aggradation are very slow, probably in the range of only a few inches per millennium. At this rate, attainment of a common level would require tens if not hundreds of thousands of years.

There is another implication of this model of terrace formation that is seemingly incongruous. If the periods of stream channel stability and instability are assumed to be caused by climatic changes attributable to glacial/interglacial cycles, it could be argued that there should be remnants of a much larger number of terraces in the valley than there are. The explanation is offered that the stability/instability cycles are correlated with climatic fluctuations within a single glacial/interglacial cycle and that during each glacial interval, the terraces in the valley are completely destroyed. Hence, the valley presently contains terraces that are no older than the Wisconsinan stage, and possibly just the Late Wisconsinan Stage. A discussion of attempts to date the terraces is contained in the next section of this report.

As discussed in an earlier report (Saucier, 1981), the Current River has built a substantial alluvial fan immediately east of the Ozark

Escarpment in the Western Lowlands segment of the Lower Mississippi Valley. It is several miles wide and over 15 miles long, extending to the vicinity of Pocahontas, Ark. It is a prism of Current River alluvium that overlies glacial outwash (valley train deposits) of Early Wisconsinan age (Saucier, 1974). On the surface of the fan are six abandoned meander belts of the Current River. Based on parameters such as meander radii and wave lengths and channel widths, they strongly suggest that the Current River carried significantly less flow than at present while three of the six meander belts (designated D, D, and E with C being the oldest of the three) were active.

The surface of the fan (which is the level of the six meander belts) appears to merge with the T_2 terrace at the point where the Current River crosses the Ozark Escarpment, although the correlation is tenuous. The present river channel and meander belt are slightly incised into the fan and, of course, merge with the floodplain level at the escarpment. Thus, there is evidence that the river experienced changes in total discharge during the time of formation of the T_2 terrace. It is not known, however, how these discharge variations relate to the hypothesized increases and decreases in channel stability attributed to changes in flooding frequency.

TERRACE CHRONOLOGY

No evidence is discernible in the stratigraphy or lithology of the terraces that directly allows estimation of their absolute age. The deposits are not inherently chronologically diagnostic and they cannot be directly correlated with deposits of known age. Nevertheless, there are chronostratigraphic tools that have been used in estimating their age.

In hindsight, of the several methods attempted, archaeological evidence seemingly has provided dates most consistent with all lines of evidence. However, the age estimates thus determined are not absolute and they are indirect in that they are based on extrapolations of cultural assemblages dated elsewhere. The archaeological evidence consists of nine sites with Early Archaic cultural components on the T_2 terrace and 22 sites with Early Archaic components on the T_3 terrace. The latter may contain one site with a PaleoIndian component, but the archaeological evidence is tenusous. Accordingly, it is possible to estimate the minimum age of the T_2 terrace at 10,000 years BP and that of the T_3 terrace at the same age, but quite likely at least several thousand years older (Table 4-4). On the basis of archaeological evidence, it is not possible to estimate maximum dates.

Deposits dateable by the radiocarbon method were found in both terraces along the Current River. These consist of several-inch-thick lenses of hard, dark gray clay with abundant organic matter that lie near the base of the terraces (Figure 4-6). They were observed at eight localities where they were encountered along eroding banks over distances of tens of feet. They underlie the fine-grained topstratum deposits and immediately overlie clean gravels and occur very close to the low water plane of the river. The organic matter consists of very well preserved leaves, twigs, seeds, cones, and bark representing species such as oak, ash, and sycamore that grow in a riverine environment during temperate climatic regimes (Voigt, 1982). The stratigraphy and lithology of the deposits strongly suggest they were laid down in shallow chutes or swales such as exist in the area today. Based on observations made after major floods when there was significant bank

LANDFORM	RADIOCARBON DATES	THERMOLUMINESCENCE DATES	ARCHAEOLOGICAL EVIDENCE
T_2 TERRACE	MODERN MODERN 590 ± 140 BP	4000 ± 700 BP	> 10,000 BP
T_3 TERRACE	2175 ± 165 BP 3415 ± 185 BP 3510 ± 90 BP	5500 ± 900 BP	> 12,000 BP

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Table 4-4. Comparison of radiometric dates and relative age estimates for Current River Valley landforms.

recession, there is no question that the organic clay lenses underlie extensive areas of terrace and are not simply surficial inclusions.

Six samples of the organic clay were obtained from four locations and dated by two laboratories (Table 4-5). Those assayed by Beta Analytic, Inc., were obtained first, and because of their anomalously young ages, additional samples from two of the same locations and one new location were assayed by Geochron Laboratories, Inc., as a check. The latter samples were carefully hand picked to remove obvious modern plant roots, although because of pretreatment of all samples prior to dating, this should not have been a factor. There were no other indications of contamination of the samples.

The two dates from the Clint Williams Spring locale are in close agreement with each other (Table 4-5), suggesting that contamination is not a factor unless there is uniform dilution of the carbon fraction with much more modern materials. However, at the Powder Mill Ferry locale, there is a significant difference in the age of the two dated samples. This suggests non-uniform contamination or an analytical error in one or both samples. Only one sample was dated from the Pender Farm locale, but a check on the accuracy of the date is possible by way of an archaeological site located on the top of the terrace within several hundred feet of the radiocarbon sample locale. The reported age of this site is Woodland which means that it probably dates from about 1400 to 2000 years BP. This implies a maximum duration of 775 years for terrace formation and possibly as little as 175 years. This is interpreted as insufficient time for the formation of a terrace that is over 15 feet high.

Samples of terrace soil matrix were taken at the Powder Mill Ferry

LAB NO.	SITE NAME	GEOGRAPHIC LOCATION	COORDINATES	GEOLOGIC SETTING	C_{14} DATE
Beta - 5667	Powder Mill Ferry	SE¼ SE¼ NW¼ S16 T29N R2W	37°10'47" N. Lat. 91°10'23" W. Long.	Base of T_2 terrace	Modern
GX - 10208	" " "	" "	"	" " " "	590±140 B.P.
Beta - 5668	Clint Williams Spring	NE¼ NE¼ NE¼ S18 T29N R2W	37°11'07" N. Lat. 91°11'59" W. Long.	Base of T_3 terrace	3510±90 B.P.
GX - 10210	" " "	" "	"	" " " "	3415±185 B.P.
Beta - 5669	Buttin Rock	SW¼ SE¼ NW¼ S33 T29N R2W	37°08'10" N. Lat. 91°10'31" W. Long.	Base of T_2 terrace	Modern
GX - 10209	Pender Farm	SW¼ NE¼ SW¼ S29 T27N R1E	36°58'30" N. Lat. 90°58'48" W. Long.	Base of T_3 terrace	2175±165 B.P.

LAB NO.	SITE NAME	GEOGRAPHIC LOCATION	COORDINATES	GEOLOGIC SETTING	TL DATE
A - 2107	Powder Mill Ferry	SE¼ SE¼ NW¼ S16 T29N R2W	37°10'47" N. Lat. 91°10'23" W. Long.	Lower 1/3 of T_2 terrace	4000±700 B.P.
A - 2108	Pender Farm	SW¼ NE¼ SW¼ S29 T27N R1E	36°58'30" N. Lat. 90°58'48" W. Long.	Lower 1/3 of T_3 terrace	5500±900 B.P.

Table 4-5. Radiocarbon and thermoluminescence dates obtained on samples of T_2 and T_3 terrace deposits.

(T_2 terrace) and Pender Farm (T_3 terrace) locales for thermoluminescence dates in an attempt to determine the reliability of the radiocarbon dates (Table 4-5). While stratigraphic evidence suggests otherwise, the possibility could not be ruled out entirely that the organic debris dated by the radiocarbon method represents materials deposited in chutes or swales that did not fill until well after formation of immediately adjacent terrace areas. If this was the case, the radiocarbon dates could be accurate and there would be no conflict with archaeological evidence that dates the terrace deposits per se rather than filled swales.

The thermoluminescence dates performed by Alpha Analytic, Inc., and obtained on soils located two-thirds the distance from the top of the terrace outcrops to the low water plane in the river (the elevation of the lens of organic clays), help substantiate that the radiocarbon dates are anomalously young. In both cases, the thermoluminescence dates are considerably older than the radiocarbon dates, but still not old enough to be compatible with the archaeological evidence. Thus, there is no viable explanation for the major discrepancy among the three dating techniques employed. At this time, the archaeological evidence appears to be more reliable.

An indirect method of estimating the age of the terraces involves correlating the inferred terrace formational processes with probable climatic/environmental conditions that could have produced the particular inferred fluvial respones. Several degrees of uncertainty are associated with this method. Climatic conditions are inferred from vegetative communities as interpreted from fossil pollen assemblages and are correlated with stages in waxing and waning continental glaciation.

Less certain are the relationships between climatic change and responses of fluvial systems. Traditionally, emphasis has been placed on variations in stream discharge caused by changes in actual precipitation and/or changes in runoff due to variations in evapotranspiration rates. These have been correlated with stream aggradation and degradation and hence terrace formation. More recently, emphasis has been placed on the influence of changes in the frequency and intensity of precipitation events. These are believed by some to be more important in determining channel stability and hence the nature of the response of floodplains. Correlation of such variations and glacial/interglacial cycles involves reconstructions of former air masses and atmospheric circulation patterns. Implicit in determining the consequences of such variations is evidence that changes from one precipitation regime to another were not slow and gradual. Rather, episodes of uniform conditions were separated by rather abrupt changes or discontinuities.

Although such climate/fluvial system relationships are tenuous and argumentative, they offer the potential for creating and testing paleoenvironmental models. Figure 4-13 is a proposed model for the Current River valley. In this model, the T_2 terrace is assumed to correlate with an episode of channel stability that is estimated to have occurred between about 7000 and 15,000 years BP. The T_3 terrace level is correlated with a similar episode that is estimated to have occurred about 23,000 to 35,000 years BP. The T_4 terrace is estimated to be greater than 75,000 years old. It should be emphasized that while these age estimates are compatible with general process-based concepts of terrace chronostratigraphy on a regional scale, there is no supporting evidence and indeed there is conflicting eividence present in the ONSR

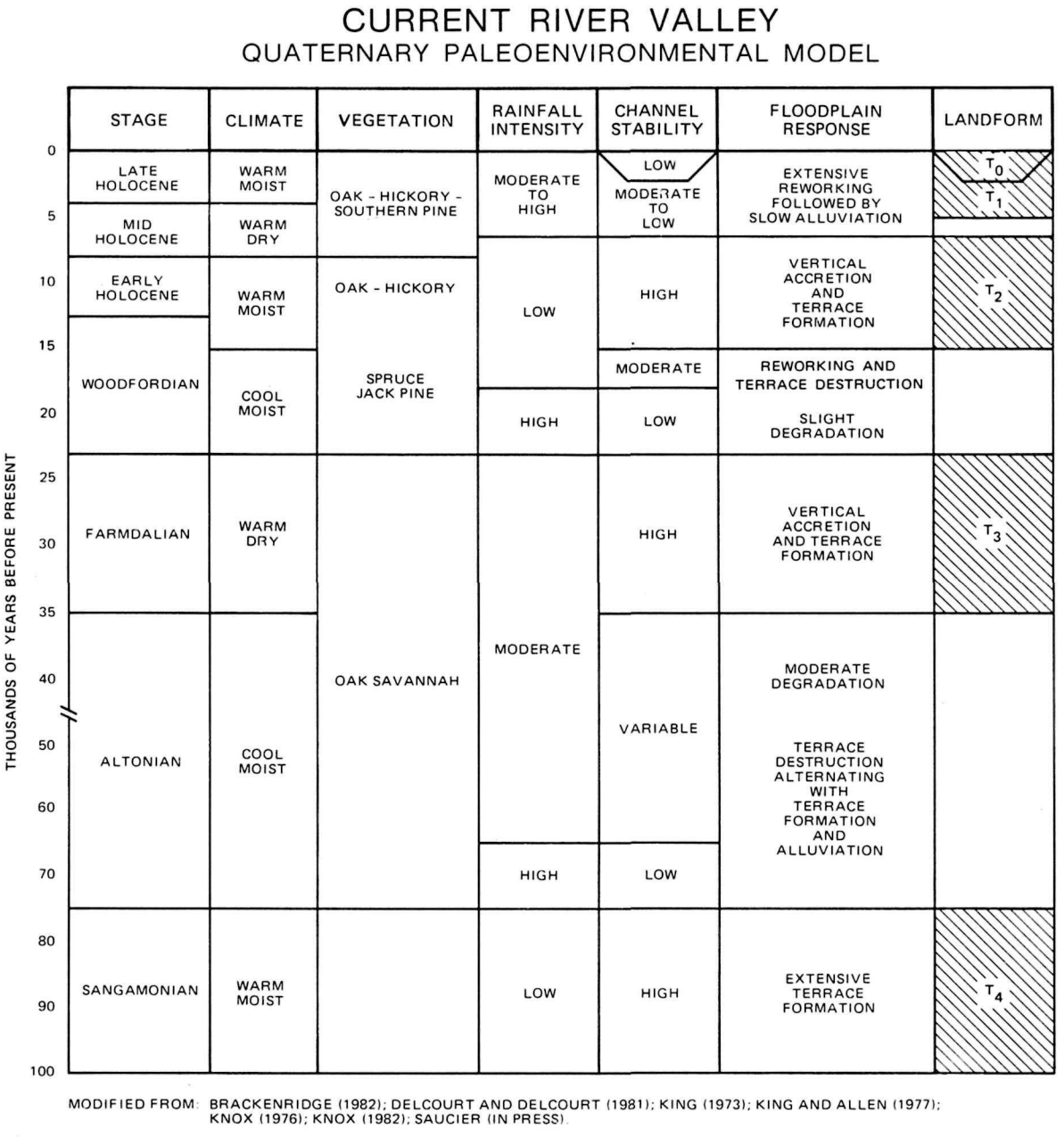


Figure 4-13. Quaternary paleoenvironmental model of the Current River valley.

area.

As a partial test of the model and of the accuracy of the radiocarbon dates, three samples of the organic clay lenses were hand-floated and examined for paleobotanical macro-fossils by Eric E. Voigt of the University of Missouri. These examinations revealed the the floral assemblages are representative of a riverine (floodplain) environment during a temperate climatic regime. Thus, the vegetaion species present are compatible with what would be expected to occur during either the period of the radiocarbon dates (0 to 3500 years BP) or the periods postulated in the paleoenvironmental model, i.e., the Early to Mid Holocene or the Farmdalian Stage. Hence, the results of these examinations are nonconclusive.

Finally, the only other evidence with chronologic implications includes the six abandoned meander belts on the Current River alluvial fan along the western edge of the Mississippi Alluvial Valley. These were originally estimated (Saucier, 1981) to span the period from 5000 to 12,000 years BP. Archaeological evidence generally confirms this, although suggesting that the earlier meander belts (paleochannels) may be several thousand years older (Price and Price, 1981). As has been mentioned, the surface of the fan appears to merge with the T_2 terrace at the mouth of the Current River valley at the Ozark escarpment. Hence, there is general agreement between the ages of the channels and the terrace although the actual relationship between the two landforms has not been established.

HISTORIC PERIOD PROCESSES

According to the paleoenvironmental model (Figure 4-13), the last 7000 years has been a period of moderate to low channel stability and slow alluviation of the floodplain. While the T_1 surface is an incipient terrace, nevertheless it marks the extent of major floodplain reworking during this period. Since the T_0 surface is arbitrarily defined on the basis of historic surveys, the known very extensive floodplain reworking of the last 150 years or so certainly must extend back into the early historic and late prehistoric periods to include some of the T_1 surface. The very large percentage of the Current River valley above Pulltite included in the T_1 unit and the very small percentage included in the T_0 unit (Figure 4-7) suggest that the very extensive floodplain reworking probably extends back at least several hundred if not a thousand years. Reasons for this rather prehistoric decrease in channel stability are not known but, as is discussed below, possibly could include the effects of vegetation change brought about by timber cutting for firewood, village sites, and horticultural land.

There can be no question that the dramatic historic period changes in the stream valleys in this portion of the Ozarks are due directly and indirectly to vegetation changes. Major changes are manifest at both a regional and landform scale; hence, vegetation change can be viewed as a significant geomorphic agent.

The first vegetation change of the historic period, one that affected the entire region, was the widespread clearcutting of upland pine forests for timber resources. Some of this activity dates to the period from the 1830s to the 1860s; however, most of the significant activity took place between the 1890s and the 1920s. The nature of the

logging was such that, before vegetation could reestablish itself, there was major erosion of upland soils. Most of the clay, silt, and sand eroded from the uplands probably was swept downstream out of the region, but the gravel accumulated in the stream valleys.

Historic accounts suggest most if not all small tributaries of the Jacks Fork and the Current River originally had surface flow throughout the year since most are spring fed. However, most now are broad, dry, gravel-floored channels that have surface flow only during periods of flooding. These gravel-choked valleys are probably still the principal storage location for most of the gravels eroded from the uplands. Nevertheless, a "wave" of gravel has moved into the Current River valley and is progressively moving downstream (Figure 4-14). Assuming that the T_0 unit is an indicator of this phenomenon, the principal mass of the gravel wave is still north of Doniphan (Figure 4-7).

Aerial photos of the area taken during the 1930s indicate the river channels had large expanses of gravel-covered point and mid-channel bars that were largely free of vegetation. This condition had probably persisted for several decades and was perpetuated by land use practices that included open-range grazing of livestock. With the bars not stabilized by vegetation, the gravel was easily reworked and moved downstream from bar to bar and island to island during floods. Thus, the river was adjusting itself to the gravel wave and was progressively moving it downstream seeking to establish an equilibrium.

However, during the last several decades, land use changes that have included cessation of open-range grazing and significantly reduced agriculture have resulted in appreciable floodplain forest regrowth and bar stabilization (Figures 4-15 and 4-16). As a consequence, the down

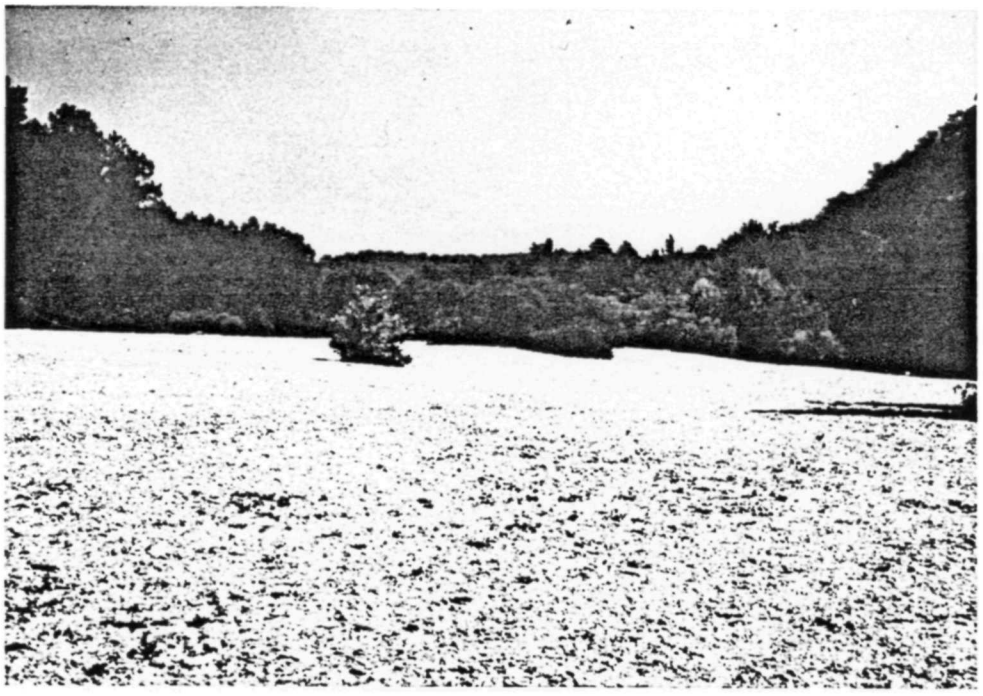


Figure 4-14. Large gravel bar on the Current River near Logyard composed mainly of materials eroded from upland soils during the last 150 years.

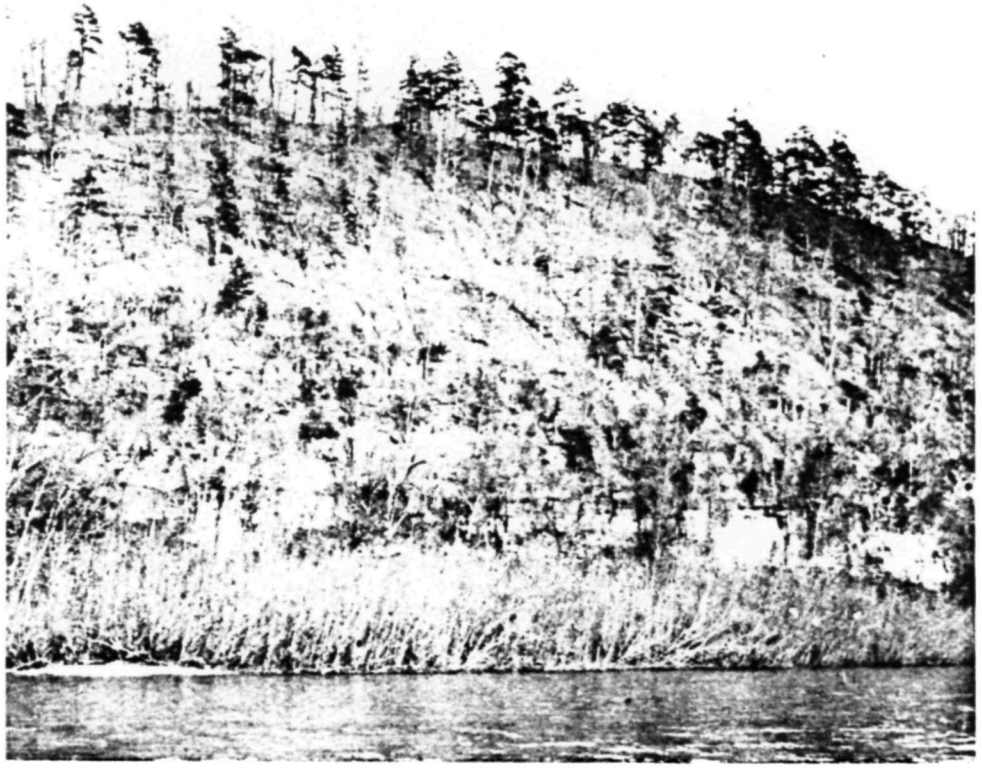


Figure 4-15. U.S. Forest Service photo of Cedar Bluff area in 1935 showing cutover uplands and recent gravel bar with young growth.

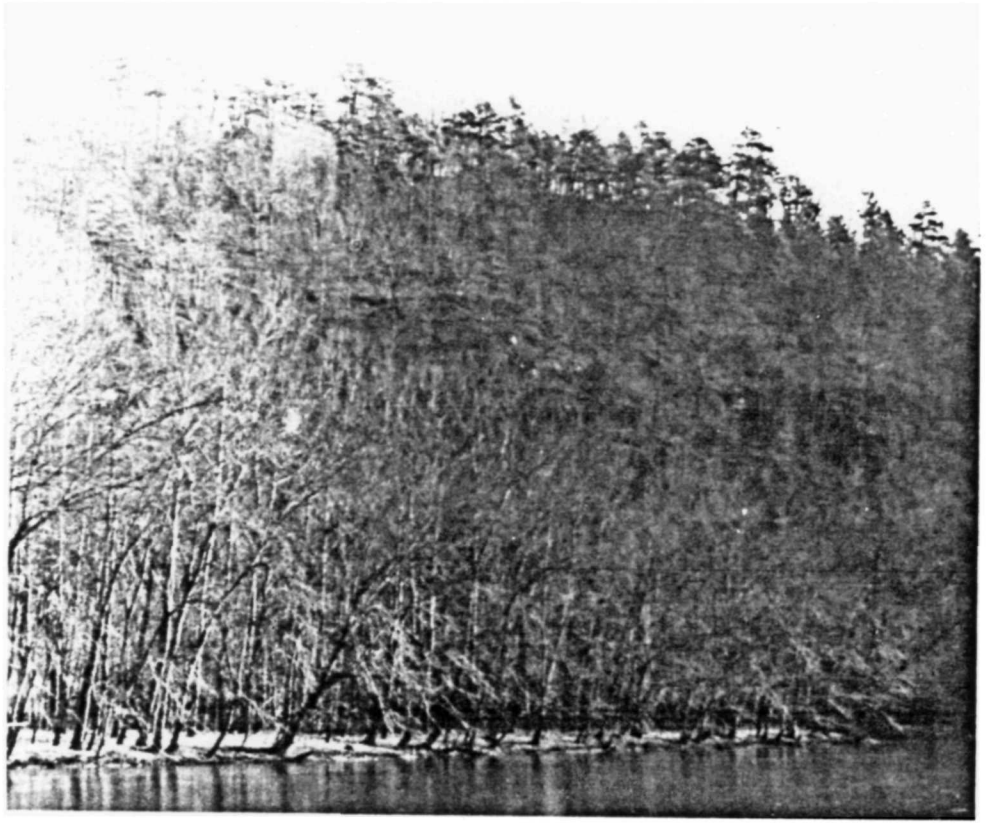


Figure 4-16. U.S. Forest Service photo of Cedar Bluff area in 1980 showing forest regrowth in uplands and substantial tree growth on stabilized bar.



Figure 4-17. Eight-foot high gravel/cobble mound deposited in a forested area on the T_0 surface near Powder Mill Ferry during a major flood.

stream movement of gravels has been greatly reduced. The comparative historic period ground photos also document a major revegetation of the uplands, indicating a major reduction in upland erosion and minimal new gravel introduction to the fluvial systems. Revegetation of the floodplains has also resulted in the deposition of large quantities of gravels on the T_0 and T_1 surfaces and appreciable aggradation of these levels (Figure 4-17). In essence, these deposits have been placed in long-term storage efficiency and increased rates of runoff. However, with regrowth of upland forests and stabilization of much of the gravel in the valley, it can be argued that there should have been a subsequent noticeable decrease in annual flood stages during the last several decades due to retarded runoff. This has not occurred. The reason it has not occurred may be due to the significant overbank deposition on the T_0 and T_1 units as a consequence of vegetation regrowth. The effect of this would be to reduce the volume of out-of-channel temporary storage for floodwaters which would translate into increased flood stages. Simply stated, there is less room for the water to spread laterally, so it must increase in height during a flood event.

Irrespective of cause, the severe floods of this decade have produced major and probably unprecedented changes in valley landforms. Severe bank erosion (Figure 4-23), chute formation, bar and island formation and destruction, and overbank scouring and deposition have resulted. Gravels and cobbles considerably coarser than any observed in the terraces have accumulated on bars to heights well above levels of gravel occurrence in any observed terrace outcrop. Vegetation has had a major buffering influence, but it has not been able to prevent geomorphic

change in view of the high flood levels and water velocities experienced.

SITE/LANDFORM RELATIONSHIPS

In general, the relationships between sites and landforms in the ONSR area are not as meaningful in terms of paleogeographic reconstructions as they are in a more dynamic landscape such as the Mississippi Alluvial Valley. Nevertheless, there are important implications to both archaeology and geomorphology. For example, initial occupations of sites have established that both terraces were well formed before first human occupation of the region and that the T_1 unit is too young for sites of prehistoric occupation. On the other hand, terrace distribution helps explain certain aspects of site occurrence that vary with time.

Several general relationships are apparent. Although the entire valley (including both terraces) is subject to inundation during major floods, the duration of flooding (at most a few days) obviously was not a major deterrent to permanent habitation and horticulture/agriculture and other economic pursuits. Indeed it has not precluded a wide variety of land uses in historic times. As pointed out previously, some overbank sedimentation occurred during floods, but was not rapid enough to deeply bury sites or even to cause deeply stratified deposits and will not be available again for transport until these portions of the floodplain are reworked by lateral channel migration. Where the floodplain and even the terraces have been cleared of forest vegetation, such as in campground areas, appreciable scouring can take place, however (Figure 4-18). Tree growth reduces the velocities of floodwaters, thereby minimizing scouring and promoting the deposition of

sediments. The amount of coarse-grained sediment that has been added to the fluvial system as a result of the scouring of cleared areas is insignificant as compared to what was contributed by upland erosion.

Much of the mass of gravel that entered the Current River fluvial system during historic times has accumulated in the sedimentation zones discussed earlier and shown in Figure 4-8. In these zones, two types of responses of the stream channel are evident. Where the supply of moveable gravel is low to moderate, the channel shows a tendency to straighten or maintain a given curvature of its bends while migrating downstream. Figure 4-19, one of a series of comparative bank line plots made from aerial photos, illustrates this type of channel behavior. Where the supply of easily moveable gravel is moderate to large, such as in the Gooseneck area (Figure 4-20), the curvature of the bends remains constant or increases and there is appreciable downstream shifting of the bends.

Looking at the entire riverways area and considering the last 100 to 150 years, as indicated by the extent of the T_0 unit, the magnitude of the effects of gravel introduction on a regional basis can be appreciated. The extent of the T_0 unit indicates that about 15 percent of the total floodplain area has been reworked during this period. Without the introduction of the gravel, it is estimated that this amount of reworking would have required 5,000 to 10,000 years.

Another historic period change evident in the Current River valley is the significant increase since 1920 in the height of the highest annual flood stages (Figure 4-21). A running average plotted through the yearly data indicates an increase of about 4 feet between 1920 and 1981. Data are not available for years after 1981, but it is expected



Figure 4-18. Severely scoured cleared area along the Jacks Fork after a major flood. Grass sod was completely stripped from the floodplain surface in the foreground.

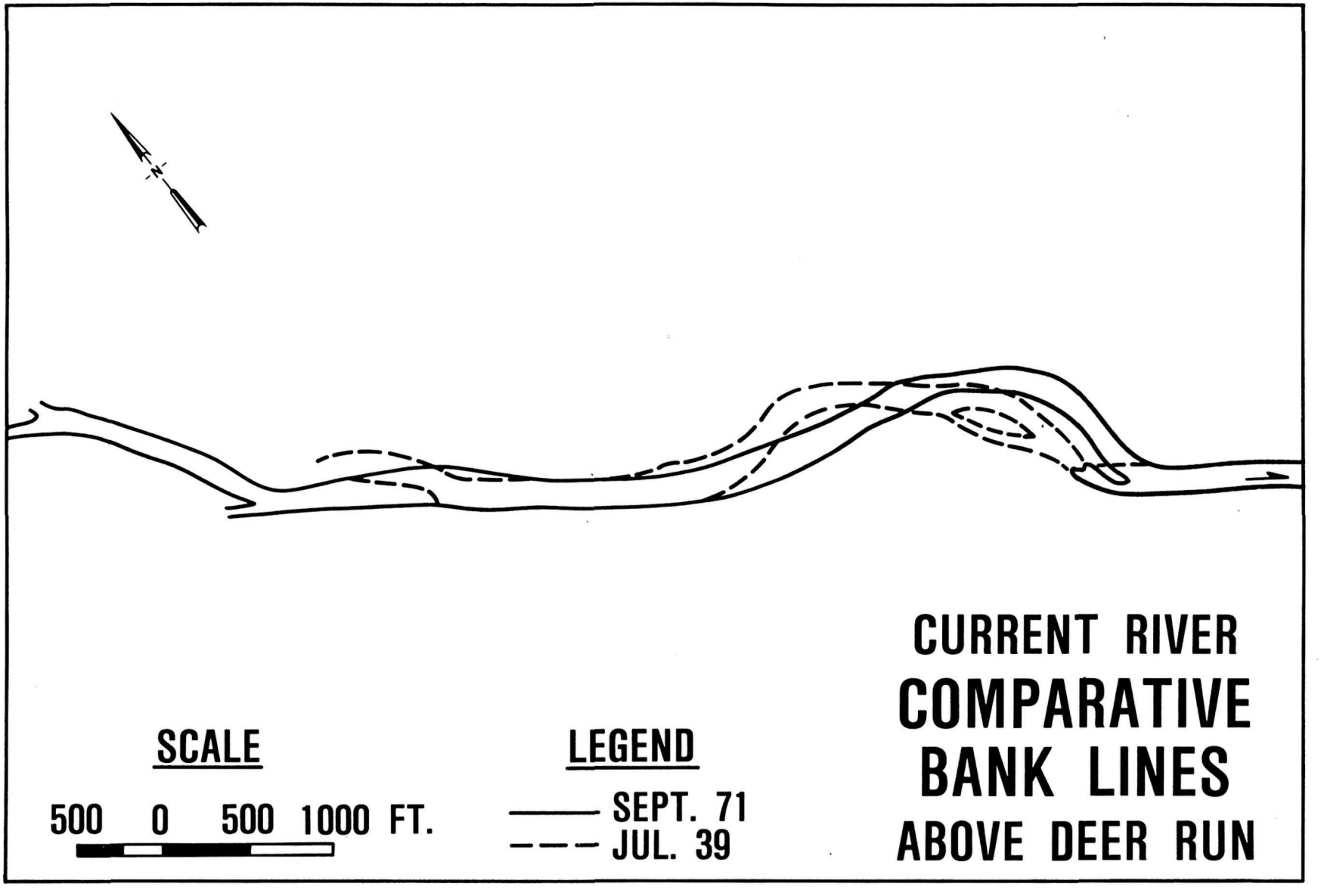


Figure 4-19. Comparative bankline positions of the Current River showing Channel behavior in an area of high sediment supply, above Deer Run.

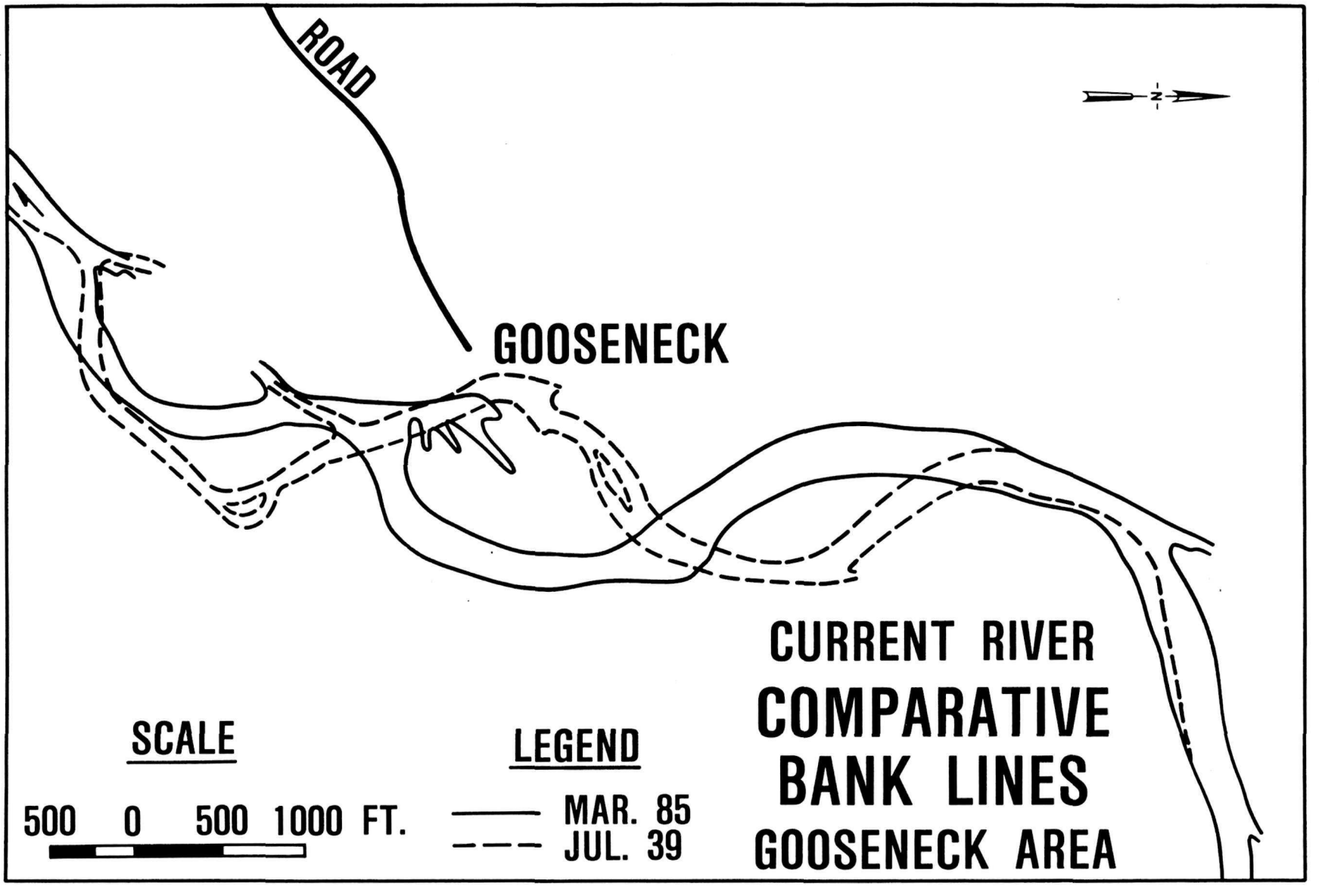


Figure 4-20. Comparative bankline positions of the Current River showing Channel behavior in an area of high sediment supply, Gooseneck Area.

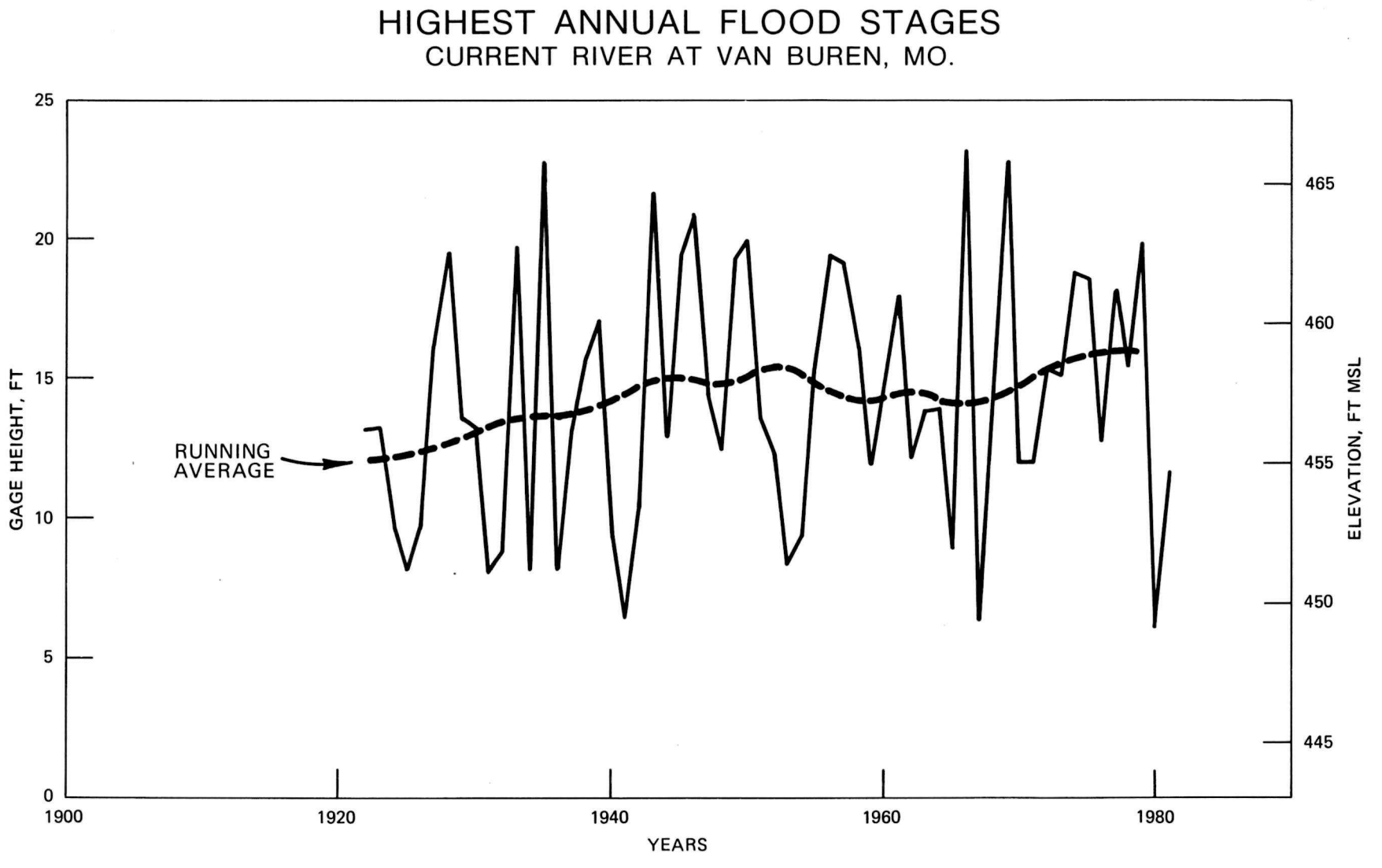


Figure 4-21. Sixty-year trend of highest annual flood stages on the Current River at Van Buren.



Figure 4-22. Effects of a Spring 1983 flood on the Current River at Big Spring.



Figure 4-23. Severe bank erosion along the Current River north of Doniphan as a result of a major flood.

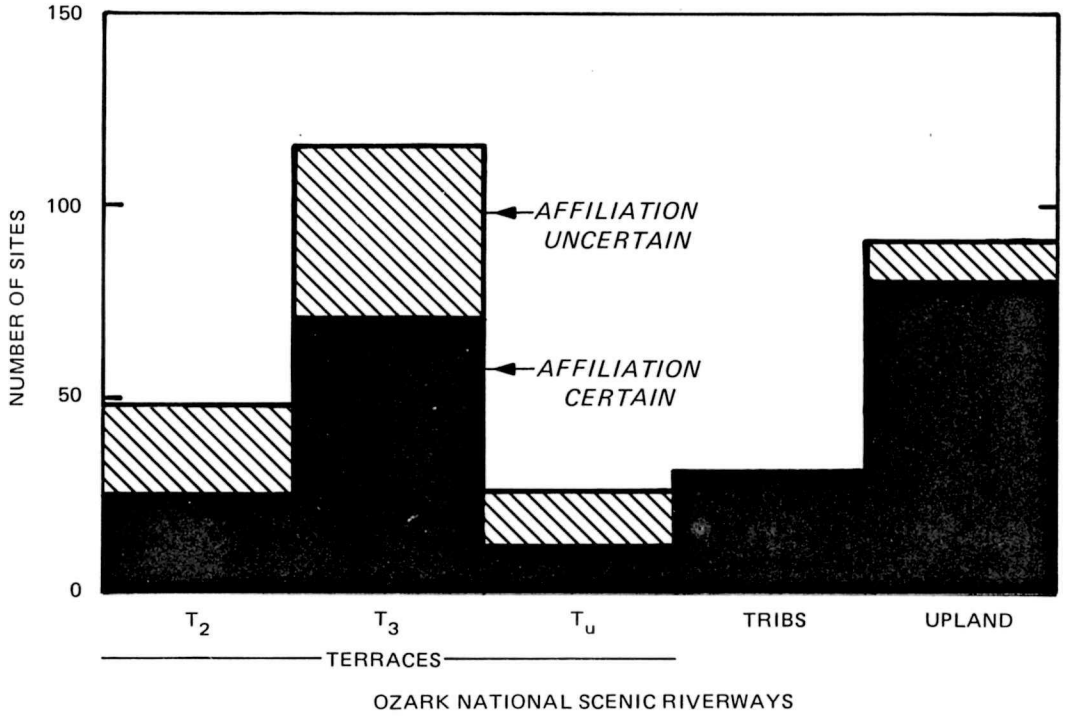


Figure 4-24. Occurence of archaeological sites by landform type in the ONSR area.

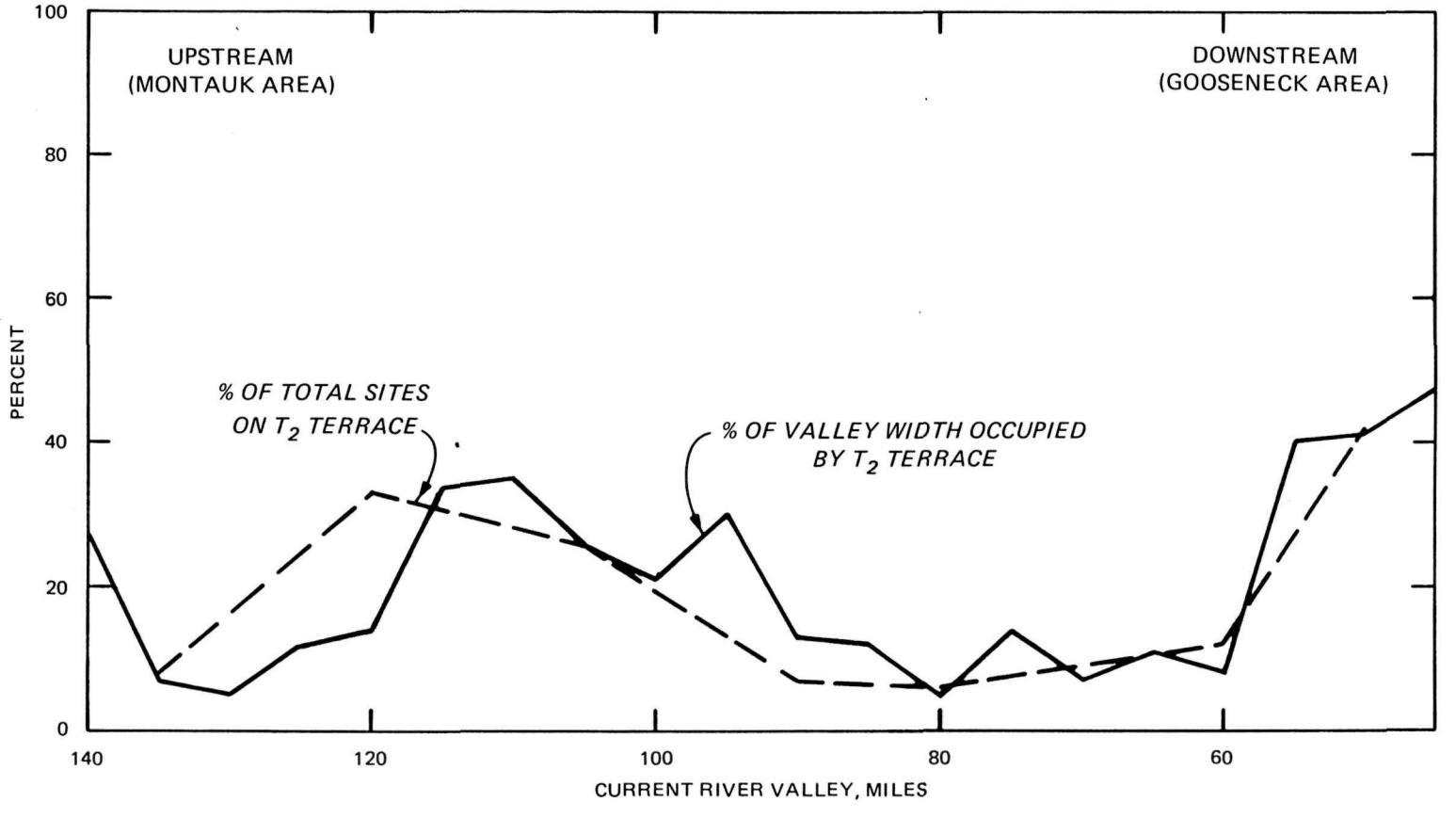


Figure 4-25. Relationship between site occurrence and extent of the T_2 terrace along the Current River.

that the trend has continued at probably an increasing rate since there have been several record or near-record floods during the last few years (Figure 4-22).

The cause of this increase in flood stages is not known with certainty, and it may be due entirely to climatic factors, i.e., a short-term period of increased severe storm events. It is logical that there could have been an increase in flood stages that accompanied the choking of the valley with gravel and the clearing of upland vegetation. These would have reduced channel sites on the terraces. Tributary streams did not carry a sediment load conducive to alluvial fan formation at their mouths, and in general, apron formation along the valley margins was retarded by the characteristic pattern of stream channel migration and chute formation. Hence, there are not likely to be buried sites in these settings.

Assuming that there was no bias in the site surveys favoring discovery of sites of a particular age on a particular landform, Figure 4-24 illustrates the landform association of sites in the ONSR area. It is apparent in this figure that the T_3 terrace is the preferred valley landform and that uplands adjacent to the valleys were the second choice. If a survey bias is present, it is probably in the form of an underrepresentation of the uplands since these areas were not surveyed as extensively as were the valleys. In Figure 4-24, the designation T_u signifies a terrace association but one in which the specific terrace identification is uncertain.

That the T_3 terrace landform was the preferred valley setting for habitation is certainly logical in the region. As such, they were less frequently flooded than were lower areas. There were probably little or

no differences in soils and vegetation between the two terraces.

Figure 4-25 shows the relationship between the percentage of the Current River valley occupied by the T_2 terrace and the total number of sites on this terrace as a function of location along the valley. On the basis of this evaluation and a similar one for the T_3 terrace, it is apparent that the prehistoric populations used whatever terrace space was available to them since there is a strong direct relationship between terrace area and site frequency. Simply stated, where the terrace was present, it was utilized; where it was absent, the Indians lived elsewhere.

A potentially more significant evaluation of site/landform relationships is summarized in Figure 4-26 wherein site associations along the Current River are plotted by major cultural period. As in Figure 4-24, the landform units are the two terraces (T_2 and T_3), undifferentiated terraces (T_u), the downstreammost portions of tributary valleys (Tribs), and uplands adjacent to the valley. The sample size used includes all sites with identified cultural affiliations, including tenuous ones.

The samnple size for the PaleoIndian period (4 sites) is too small to make definitive statements; however, other trends are apparent that appear meaningful. In all periods, the T_3 terrace was the preferred setting for habitation. During the Dalton-Early Archaic period, the T_2 and the uplands had the second highest utilization. With minor variations, this same general pattern pertains to the Late Archaic, Woodland, and Mississippian periods. However, during the Middle Archaic, a significantly different pattern is quite evident. At that time, the second most preferred landform is the T_2 terrace and the uplands had relatively

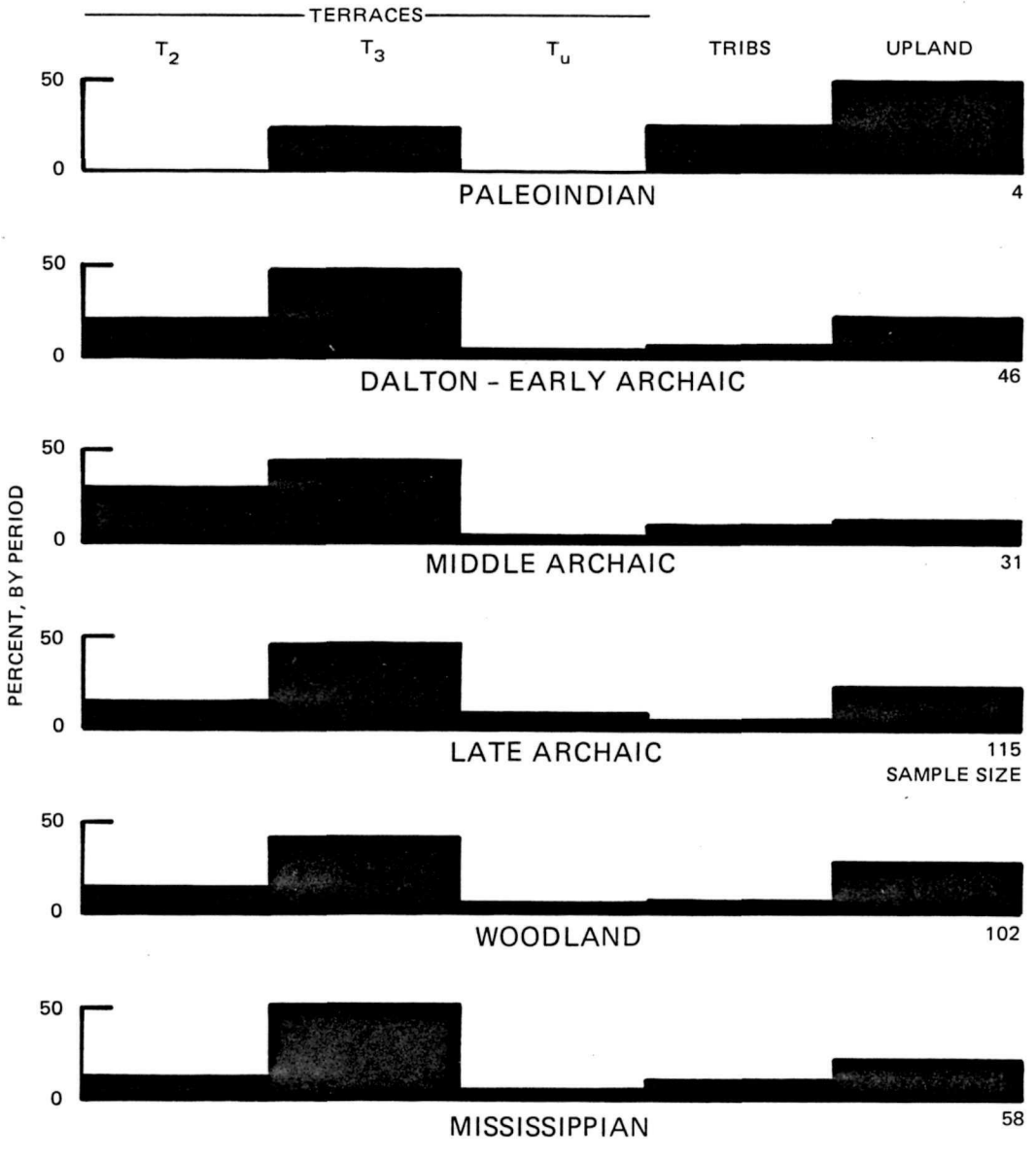
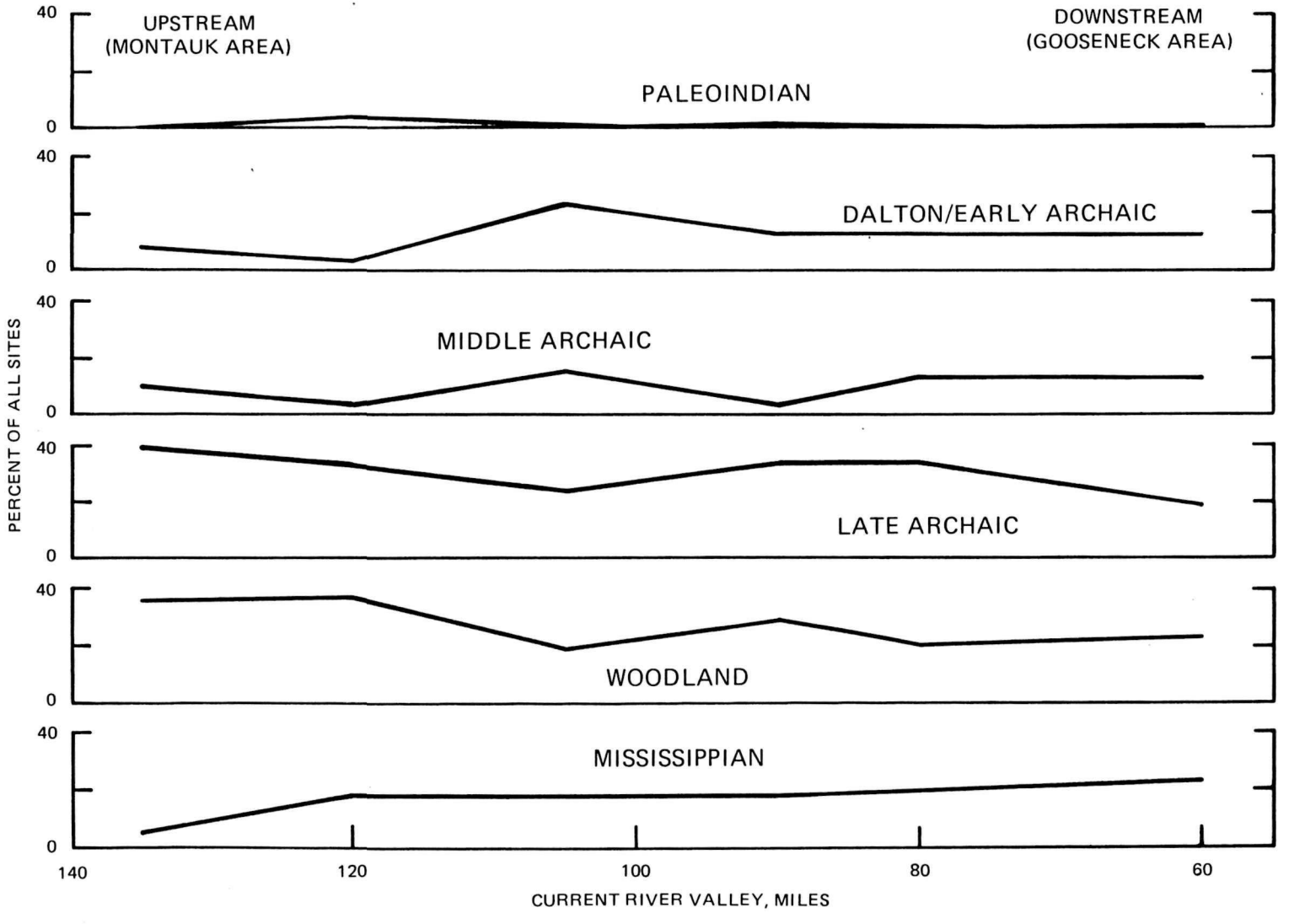


Figure 4-26. Site/landform associations in the ONSR area as a function of cultural period.

Figure 4-27. Downvalley trends in site occurrence along the Current River according to cultural period.



little habitation. In fact, this period marked the least use of the uplands throughout all of prehistoric times. Since the Middle Archaic coincides with the Mid Holocene period of increased aridity (variously referreded to as the Altithermal, Hypsithermal, and the Atlantic periods), in which there was eastward expansion of prairie grassland conditions into the Midwest, the perceived trend could mean deterioration of living conditions in the uplands. As shown in Figure 4-13, the early part of the Mid Holocene was also a time of inferred low rainfall intensity and high channel stability. It is possible that these conditions resulted in reduced flooding frequency of the T_3 terrace. Thus, the pattern observed during the Middle Archaic may represent a combination of decreased habitability of the uplands and increased habitability of the low terrace working together to affect a shift in habitation preference.

It is also interesting to observe that while the T_3 terrace was favored during all periods, the time of absolute greatest habitation was during the Mississippian period. This trend is possibly attributable to the need during this period for relatively large tracts of flat ground for villages and/or land for horticulture/agriculture.

Figure 4-27 illustrates trends in site frequency along the Current River as a function of cultural period. Only the trends observed with regard to the Late Archaic and Mississippian periods appear to be regionally persistent. Late Archaic sites decrease in frequency in a downstream direction in comparison to those of other periods while Mississippian sites increase in frequency. Neither of the trends appears to be related to landform distribution. The Mississippian period trend, possibly related inversely to the Woodland period trend,

may only be an artifact of cultural period definition. The Late Archaic trend may be real, but is unexplainable and probably reverses with increased distance south of the ONSR area.

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SUMMARY

James E. Price

Archaeological and paleoenvironmental investigations from 1981-1986 by the Southwest Missouri State University Center for Archaeological Research generated data on both the prehistoric and historic cultural resources as well as past natural environments in the area now encompassed by Ozark National Scenic Riverways. This report and the preceding 4 reports submitted to the National Park Service, Midwest Archeological Center, have presented the most significant data generated by the research. In addition to these reports a mass of documentation has been delivered to the Park Service in the form of fieldnotes, maps, photographs, slides, and site forms resulting from the 5 years of research. All artifacts and ecofacts with accompanying documentation resulting from the research have also been delivered and are curated and archived at the National Park Service, Midwest Archeological Center in Lincoln, Nebraska.

The research project has generated a significant data base on the culture history of both the prehistoric and historic past as well as natural environments prior to and during the millenia of human experience in the southeastern Missouri Ozarks.

Archaeological research consisted of pedestrian survey of thousands of acres of rugged Ozark landscape to locate, document, and inventory the large variety of archaeological resources within the bounds of Ozark National Scenic Riverways. Extensive research was conducted in historical archival resources throughout the state to prepare an historical background for historical archaeological research within ONSR. Test excavations were conducted on numerous prehistoric

and historic sites. Over 10,000 artifacts in private collections were examined and photographed for the preparation of an unparalleled photo catalog of prehistoric archaeological specimens from the study area.

The measure of scientific inquiry is the amount of new knowledge it generates. In light of this, the research project has been most successful in that it has yielded significant new data for an area that was previously essentially unstudied. The project has met its intended objectives by first producing a data base for the informed management of the finite archaeological resource base of Ozark National Scenic Riverways. These data can be employed by Park Service planners for the protection and enhancement of prehistoric and historic resources under their charge. Secondly, the project has added significantly to the discipline of scholarly archaeological research by making new discoveries and presenting them to the profession.

In this scientific inquiry more new questions have arisen than have been answered. Data generated by the project have added new dimensions to our knowledge of the past which point toward exciting investigative avenues for future research.