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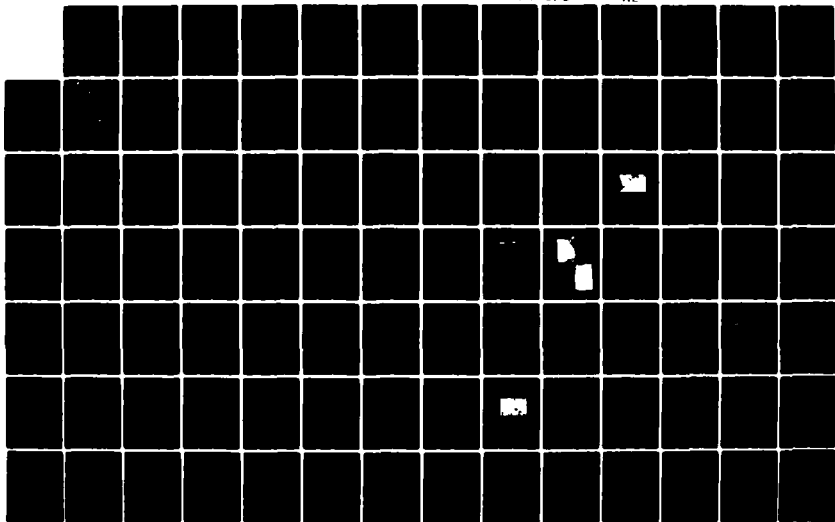
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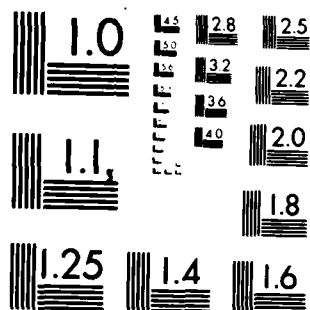
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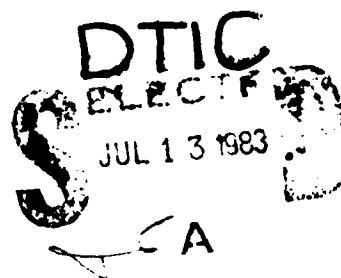
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TESTING NINE ARCHAEOLOGICAL SITES IN THE
DOWNSTREAM CORRIDOR, SAYLORVILLE LAKE,
IOWA: 1982

PROJECT: CAR-489

Prepared by

David W. Benn (Principal Investigator)
Research Archaeologist

and

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Research Archaeologist

Testing nine archaeological sites
for significance for the U.S. Army
Corps of Engineers, Rock Island
District, under terms of contract
number DACW25-82-C-0049

by the

Center for Archaeological Research
Dr. Burton L. Purrington, Director
Kerry C. McGrath, Associate Director
Southwest Missouri State University
Springfield, Missouri 65804

April, 1983

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CAR-489	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Testing nine achaeological sites in the downstream corridor, Saylorville Lake, Iowa: 1982		5. TYPE OF REPORT & PERIOD COVERED FINAL
7. AUTHOR(s) David W. Benn; Principal investigator Suzanne Harris		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Center for Archaeological Research; Dr. Burton L. Purrington, Director; Southwest Missouri State Univ. Springfield, MO 65804		8. CONTRACT OR GRANT NUMBER(s) DACW25-82-C-0049
11. CONTROLLING OFFICE NAME AND ADDRESS Corps of Engineers Rock Island District PD-E Clock Tower Building Rock Island, IL 61201		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) N/A		12. REPORT DATE April 1983
		13. NUMBER OF PAGES 153
		15. SECURITY CLASS. (of this report) Unclassified
16. DISTRIBUTION STATEMENT (of this Report) Main Report Unrestricted		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) N/A		
18. SUPPLEMENTARY NOTES Report available to public upon request at Rock Island District Corps of Engineers. Actual location of sites, however, will be undisclosed.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Geomorphology Des Moines River Archaeology Holocene Oneota		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The purpose of this investigation was to determine the research potential and eligibility for the nomination of nine sites; in the downstream cor- ridor at Saylorville Lake. The epistemology of archaeological study in fluvial sediments is also scrutinized. The nine sites are endangered by the construction of a bicycle path, road construction and erosion of a river bank. Five sites were determined too small and partially of wholly destroyed and did not meet NRHP criteria for nomination. Three sites met the criteria for NRHP eligibility although one needs further invest-		

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TESTING NINE ARCHAEOLOGICAL SITES IN THE
DOWNSTREAM CORRIDOR, SAYLORVILLE LAKE,
IOWA: 1982

PROJECT: CAR-489

ABSTRACT

Testing of nine archaeological sites (Phase II) in the Downstream Corridor, Saylorville Lake, Iowa, is reported for the U.S. Army Corps of Engineers, Rock Island District under terms of contract number DACW25-82-C-0049. The purpose of this investigation is to determine the research potential and eligibility for nomination of nine sites to the National Register of Historic Places. Epistemologies of archaeological study in fluvial sediments are also scrutinized. The nine sites are endangered by proposed construction of a bicycle path (13PK409, 13PK413), by road construction impacts (13PK410), and by erosion of the river bank (13PK405, 13PK407, 13PK411, 13PK414, 13PK415, 13PK424). All of the sites, except 13PK414, were tested by hand excavating 1-meter test units. Site 13PK414 was investigated with a 50-meter backhoe trench. A consulting geomorphologist/pedologist assisted in the interpretation of stratigraphy and soils. As a result of the investigations, sites 13PK405, 13PK409, 13PK411, 13PK415, and 13PK424 were determined to be small, partially or wholly destroyed, and do not meet the criteria for nomination to the NRHP (36 CFR 800). Site 13PK414 contains insufficient evidence to justify immediate eligibility to the Register, but in case of future impacts the right-of-way should be tested for significant cultural deposits. Sites 13PK407, 13PK410, and 13PK413 meet the criteria for eligibility to the NRHP. It is recommended that 13PK410 and 13PK413 be preserved in place, except for minor construction on 13PK413. Site 13PK407, an Oneota occupation, is recommended either for bank protection or for immediate salvage excavation. The latter mitigation is preferred as more cost effective. Holocene landscape evolution models for the Corridor, developed in 1981, are confirmed by the 1982 testing. It is concluded from the testing that traditional archaeological testing methods and concepts of site identification and management are wholly inadequate in the context of fluvial landscapes. Moreover, study of fluvial history should be the primary focus of research designs of floodplain surveys and test excavations.

CENTER FOR ARCHAEOLOGICAL RESEARCH
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TESTING NINE ARCHAEOLOGICAL SITES IN THE
DOWNSTREAM CORRIDOR, SAYLORVILLE LAKE,
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I

INTRODUCTION

The purpose of this report is to present the findings of test excavations (Phase II) on nine archaeological sites in the Downstream Corridor, Saylorville Lake, central Iowa (Figure 1). This work was accomplished under terms of contract number DACW25-82-C-0049, an agreement between the U.S. Army Corps of Engineers, Rock Island District and the Center for Archaeological Research, Southwest Missouri State University. The principal investigator for the project was David W. Benn, who directed the fieldwork and coauthored this report. E. Arthur Bettis of the Iowa Geological Survey was the consulting geomorphologist, and Suzanne Harris (Center for Archaeological Research) assisted with the fieldwork, authored the methodology section of the report, and identified the botanical remains. Holmes Semken (Department of Geology, University of Iowa) assisted Benn with identifications of some faunal remains.

Site testing was accomplished in three sessions during 1982. In late May and June the majority of site testing and evaluation was undertaken. By mid-June peak river flows and incessant rain caused temporary postponement of some testing and backhoeing. Completion dates for the contract were amended to allow for delays owing to wet conditions. The crew returned to the project area during the first week of August to complete site testing after river levels had been reduced to a low flow. Benn returned to the project again in late October to undertake the backhoeing investigation on 13PK414 and to finish the assessments of 13PK409 and 13PK411.

The objective of the project was the testing of nine archaeological sites in the Downstream Corridor to determine if the sites contained information of research interest. Sites found to contain information for research objectives meet the criteria for eligibility to the National Register of Historic Places (36 CFR 800). This action is in accordance with the National Historic Preservation Act of 1966 (PL 89-655), the National Environmental Policy Act of 1969 (PL 91-190), Protection and Enhancement of the Cultural Environment (EO 11593), and the Archaeological and Historical Preservation Act of 1974 (PL 93-291). The nine sites were recommended for testing (see Benn and Bettis 1981) because of three impacts. Sites 13PK409 and 13PK413 will be affected by construction of a proposed bicycle path; the former site will be mostly disturbed by the path, and the latter site will be crossed by the path at its southwest corner. Site 13PK410 was partially destroyed by bridge construction in 1981, and Phase II assessment is

undertaken "after the fact." Six remaining sites (13PK405, 13PK407, 13PK411, 13PK414, 13PK415, 13PK424) are being eroded by the Des Moines River when its flow is held at bank-full for long periods of time.

The specifications and goals of the Downstream site testing are detailed in Appendices I and II of this report. Essentially, the scope of work called for testing the nine sites to determine:

- the horizontal and vertical extent of each site
- the number of cultural components in each site
- the stratigraphic and geomorphic context of each component
- cultural affiliation and activity sets of each site
- relationships between the site, environment, and surrounding resources
- the current status and degree of disturbances for each site
- the relationships of the sites to the 11 research questions for the project (see Appendix II, Chapters III and V)

Also implicit in these investigations was the testing of landscape models and archaeological epistemology (see Chapter III) developed during the 1981 Downstream survey project (ibid.).

This report of investigations has five parts following the introduction (Chapter I). In Chapter II the project area is described. This chapter includes a brief discussion of the area's prehistory and previous archaeological investigations in and near the project area. Also, a Holocene landscape evolution model is described for the Des Moines River valley in the vicinity of the Downstream Corridor. This model is the framework for conducting the fieldwork and for archaeological interpretation of the data from site testing. Chapter III describes the research objectives of the testing project, the epistemological assumptions that are the basis for our approach to the testing, and the field and laboratory methodology. All of the data and findings from the 1982 site testing are described in Chapter IV. Here, we also present interpretations about cultural affiliation, function, geomorphic context, and disturbances for each site. Recommendations for the management of each site are incorporated in Chapter IV, as well. Chapter V, Interpretations, is a discussion of the project findings relating to the Holocene landscape evolution model and the 11 research questions. The project recommendations are summarized in Chapter VI. In this last chapter we also evaluate some concepts relating to the relevance of managing finite sites that are found in alluvial contexts and to the relevance of utilizing some traditional archaeological methods in alluvial landscapes. The sixth chapter closes with three recommendations for future research in the central Des Moines River valley.

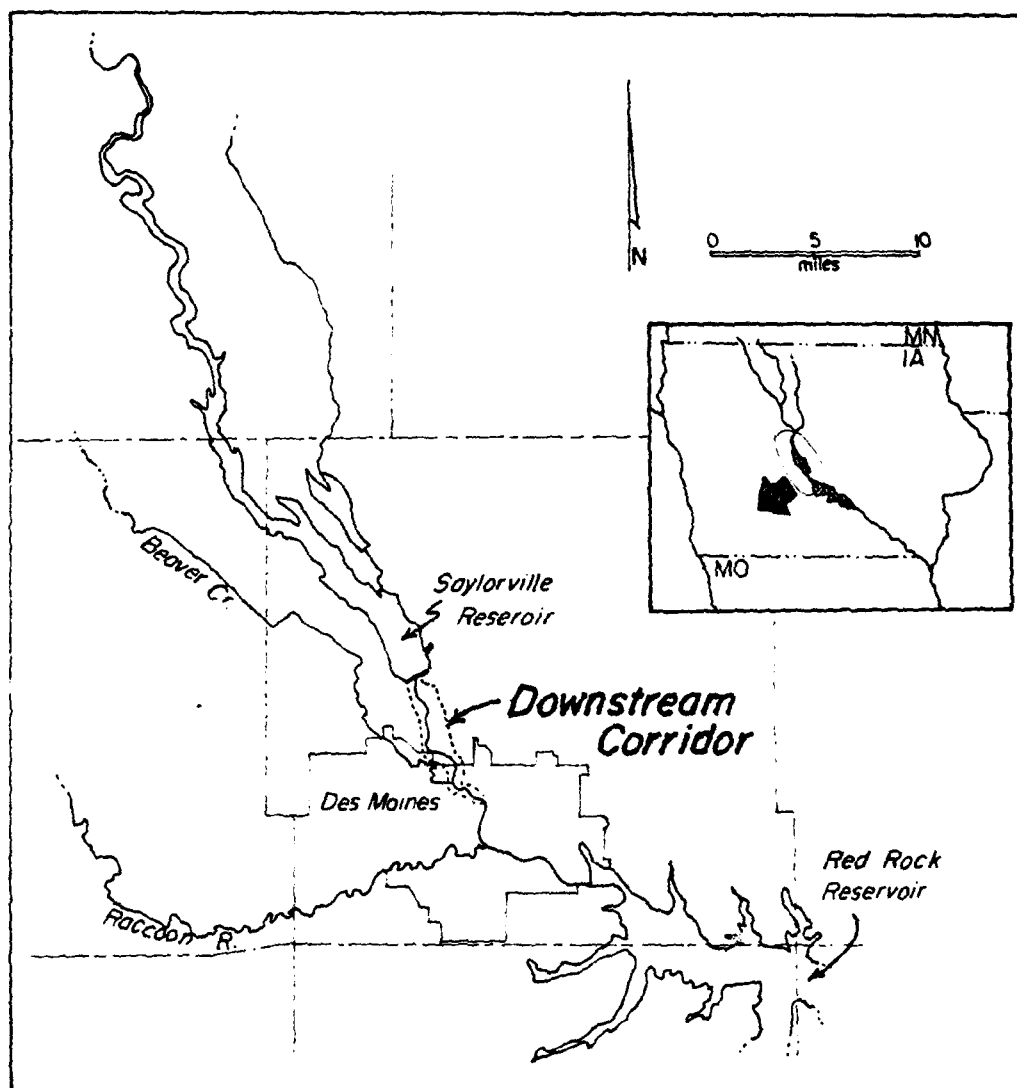
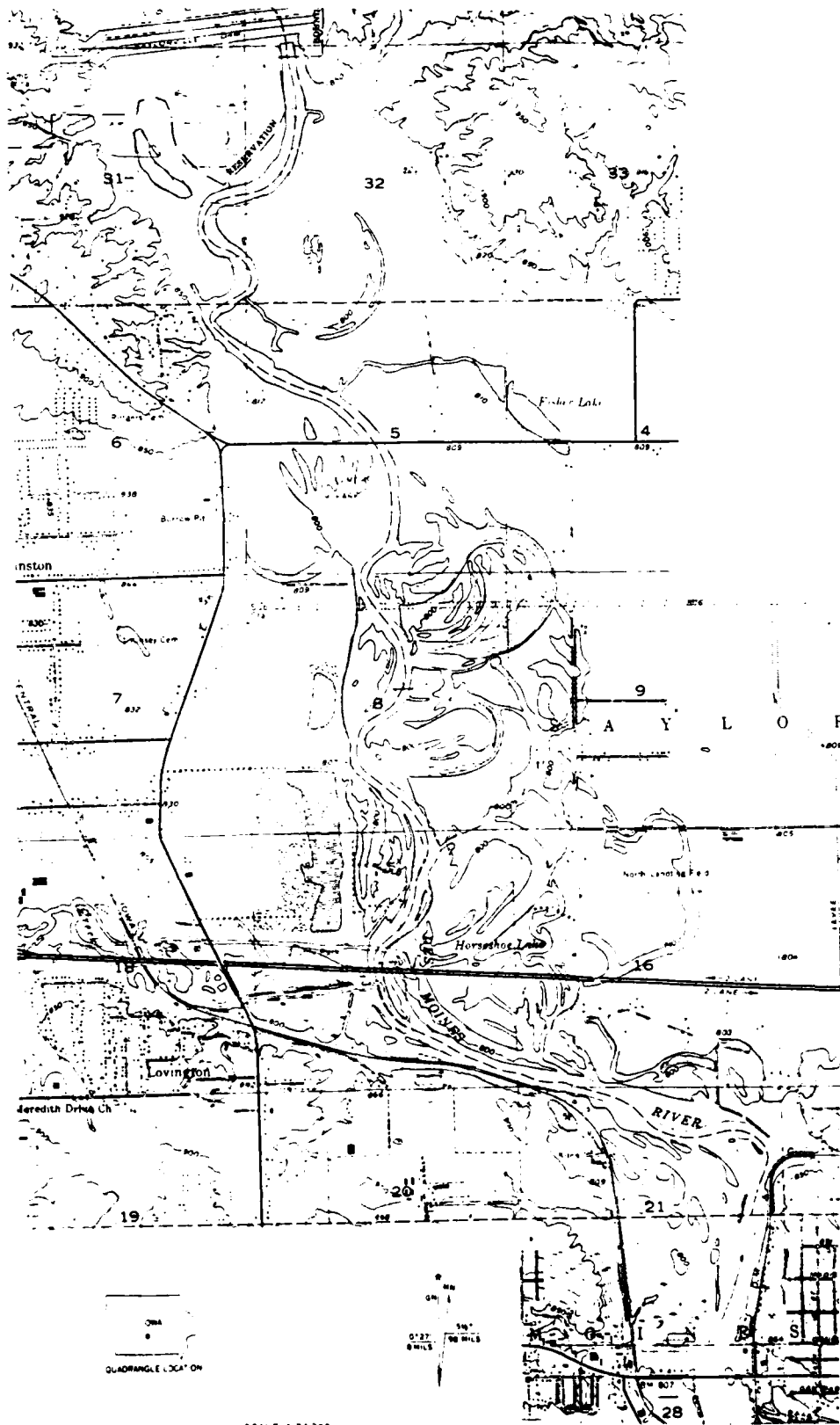
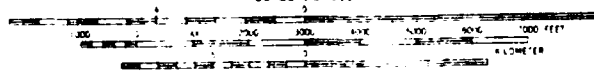


Figure 1. The Downstream Corridor project area:

Iowa and the Des Moines vicinity (above) and detail of USGS 7.5' Des Moines NW quadrangle (facing page).



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PROJECT AREA

The Downstream Corridor consists of approximately 1,500 acres (600 ha) of Des Moines River floodplain between the Saylorville Dam and the Sixth Avenue bridge in the City of Des Moines (Figure 2). Geomorphic survey of the Downstream Corridor revealed that approximately 586 acres (234.4 ha) of land were formed during prehistoric periods. Cropland covers about 382 acres (153 ha) of the prehistoric land, and the other 204 acres (81.6 ha) are covered by vegetation. A total of 914 acres (365.6 ha) of land was formed historically or protohistorically (i.e. after A.D. 1500), and nearly all of this area is covered by forest or weeds. As much as 25 percent of the recently formed landscape is made-land.

A Brief Description of the History and Environment of the Downstream Corridor

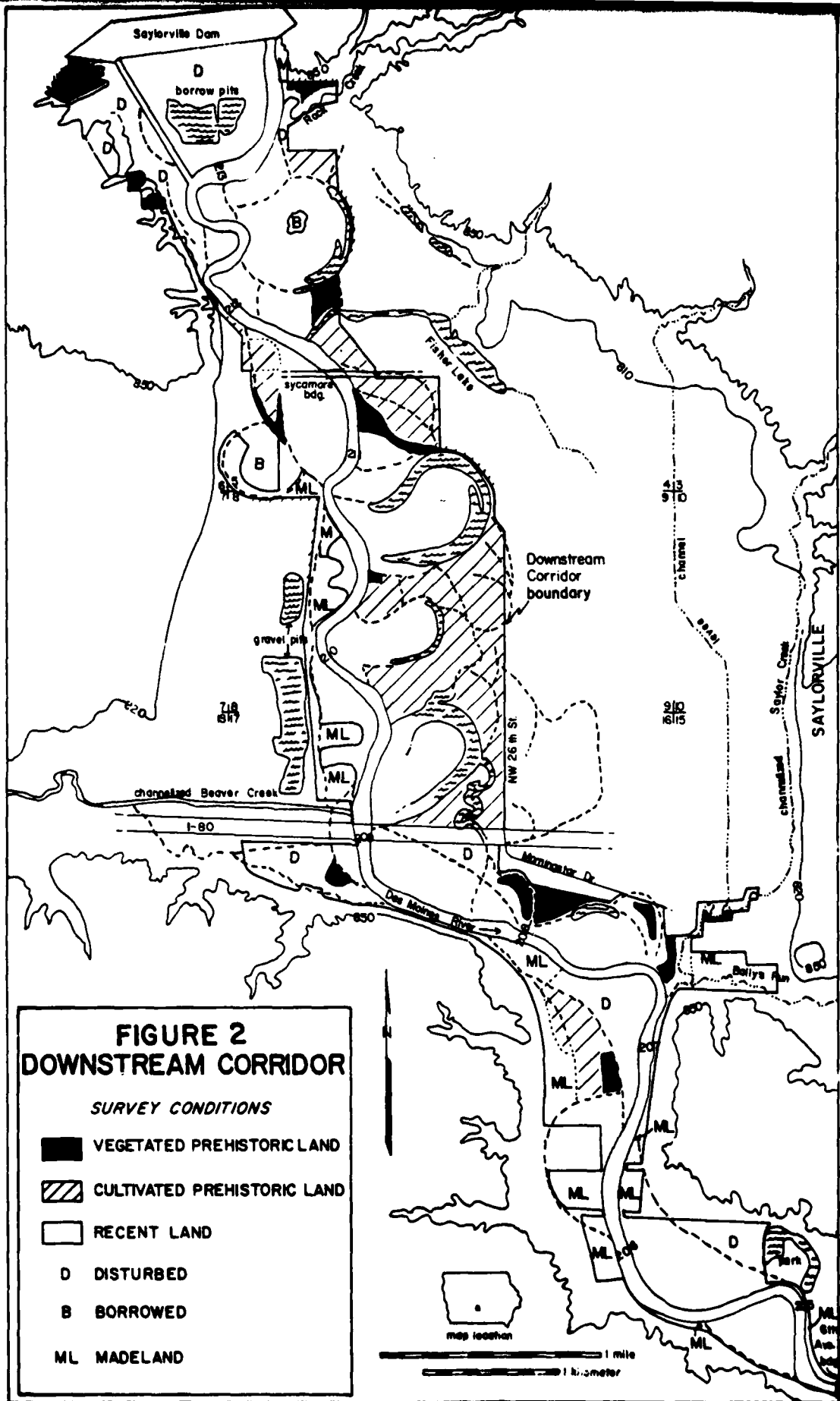
This rapid review of the prehistoric and historic events in the Des Moines valley is intended to provide the reader with the broadest possible perspective. All of the prehistoric information follows after a summary published by Gradwohl (1974).

Late Paleo-Indian and Early Archaic culture periods are represented by surface finds of unfluted lanceolate projectile points and medium-sized points with ground bases. Typologically these point styles are similar to those recovered from the Cherokee Sewer site in western Iowa (Anderson and Semken, eds. 1980) and from the Logan Creek complex in the eastern Plains (e.g. Agogino and Frankforter 1960). The writers have seen "eared" lanceolate points (i.e. similar to Clovis but unfluted) and Browns Valley points that have been recovered from Prairie Lake sites on the central Des Moines Lobe. It is entirely possible that more material of early Paleo-Indian will be found in north-central Iowa when more comprehensive surveys are done.

Materials of Middle Archaic age are not securely identified from the central Des Moines valley; indeed, remains of this age are rare over much of the Prairie Peninsula and Plains. Sites of this age have been located in alluvium (e.g. Schmits 1978), and we know from the geomorphic model that such sites could have been preserved in the Downstream Corridor.

Recently (Timberlake 1981) evidence of Late Archaic cultures has begun to appear in the central Des Moines valley. At 13PK149 radiocarbon assays on two of the lowest horizons were approximately 1100 B.C. and 670 B.C., and the latter horizon yielded large and medium-sized projectile points with stems or shallow side notches. Late Archaic sites appear to be fairly common in the Des Moines valley and seem to represent seasonal camps of small bands subsisting on large game (deer, elk, bison), small mammals, and aquatic animals.

The crews of Iowa State University (Gradwohl 1974; Timberlake 1981) have found many sites of the Woodland culture periods (Early?, Middle,

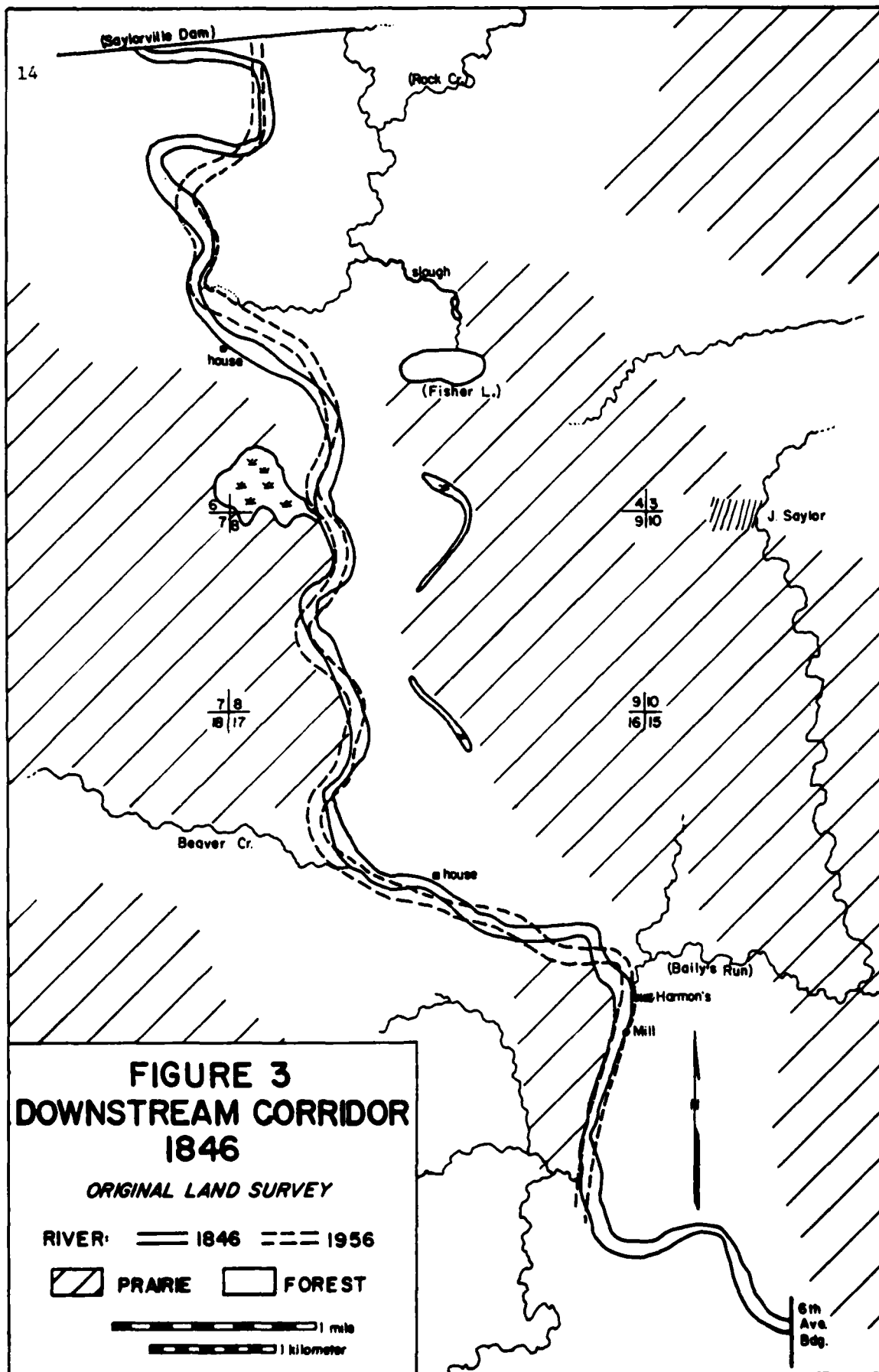


Late). There are large village and mound sites, such as the one at the Boone Mound (13BN29), small camp and mound sites, and many small material scatters that lack diagnostic materials but must be of Woodland age (by their geomorphic position). Almost all of the ISU sites are on high terraces or the bluffs, but a few have been located in the floodplain. According to the ceramic sequence, Middle Woodland remains are well represented by pottery decorations having many affinities with Illinois Havana (Griffin 1952). There is a Late Woodland manifestation as well, which is a complex of single cord decorated ceramics known as Saylor ware (Osborn, Gradwohl, and Thies 1978). It is dated to A.D. 800-1000.

The late prehistoric period includes a substantial record of Oneota (Moingona phase) and Great Oasis occupations. In general, Oneota is found south of the City of Des Moines and Great Oasis to the north of that city (Gradwohl 1974). Both cultural manifestations are evidenced by large camp and village sites with abundant midden deposits, trash-filled pits, structures, and evidence for maize complex (corn, beans, squash) horticulture and bison hunting. Radiocarbon dates for Great Oasis seem to fall after A.D. 950, while Oneota may be as late as A.D. 1200.

Just prior to the historic period, Chiwere Siouan-speaking Ioway are thought to have utilized the Des Moines valley as well as other portions of Iowa for hunting (Mott 1938). The Algonquian-speaking Sauk and Fox (Mesquakie) began to take over parts of eastern Iowa during the eighteenth century (Mott 1938; Gradwohl 1974). The Ioway ceded all lands in the state in 1830, and an 1842 treaty with the Sauk-Fox gave the Indians all lands west of the "red rocks" (near Red Rock) for three years, at which time they were to depart Iowa (Union Historical Company 1880). The Sauk-Fox camped and traded at Fort Des Moines after its establishment in 1843 and were removed to Kansas in 1845. In 1845, John Saylor established the first homestead at the location of the present town of Saylorville east of the Downstream Corridor. His settling was premature, for the Indian treaty was still in effect, and the county had not yet been surveyed. In 1846 the first land survey was conducted in Polk County (Secretary of the State of Iowa 1847; Porter 1898), and the area was opened for settlement in 1848. By 1847 there were already established homesteads and at least one mill within the Downstream Corridor (Secretary of the State of Iowa 1847). The late nineteenth century atlases (Andreas 1875; Huebinger 1904) show that the High terrace on the eastern side of the Des Moines valley (east of the Downstream Corridor) had been drained by channelizing streams (Saylor Creek), completely diverting Rock Creek west to the river, and modifying Fisher Lake (Figure 3). The settlement of Saylorville had grown immensely, and farmsteads were interspersed throughout the valley above the level of the lower terraces (i.e. on the High Terrace, Figure 4).

The vegetation patterns (Figure 3) described during the first land survey (Secretary of the State of Iowa 1847) are not unlike the present ones, except for the spread of agriculture. Dense forest covered the lowest terraces, meander scars, and floodplain within oxbow scars. Trees such as cottonwood, maple, willow, elm, ash, sugartree, hawthorn, and hickory were common in the floodplain. On higher terraces and the valley



sideslopes one would have found a forest of oaks, hickory, linden, ironwood, ash, coffeenut, black walnut, and sugartree. Most of the broad, flat terraces, especially the High terrace, were covered by meadows or prairie and intermittent oak savannahs or thickets. The rich forest and prairie habitats of central Iowa also supported an array of mammals, birds, and fish which aboriginals and early settlers depended on. Bison and prairie chicken of the prairies and white-tailed deer, turkey grouse, raccoons, and passenger pigeons of the forests provided staple food supplies (at least until some--bison, passenger pigeon, grouse--were extirpated during the early historic period). Along the river's edge animals like the beaver, otter, muskrat, turtles, and water birds were extremely common. Fish, including suckers and catfish, and freshwater mussels were easily obtained in large numbers from the river and its backwaters.

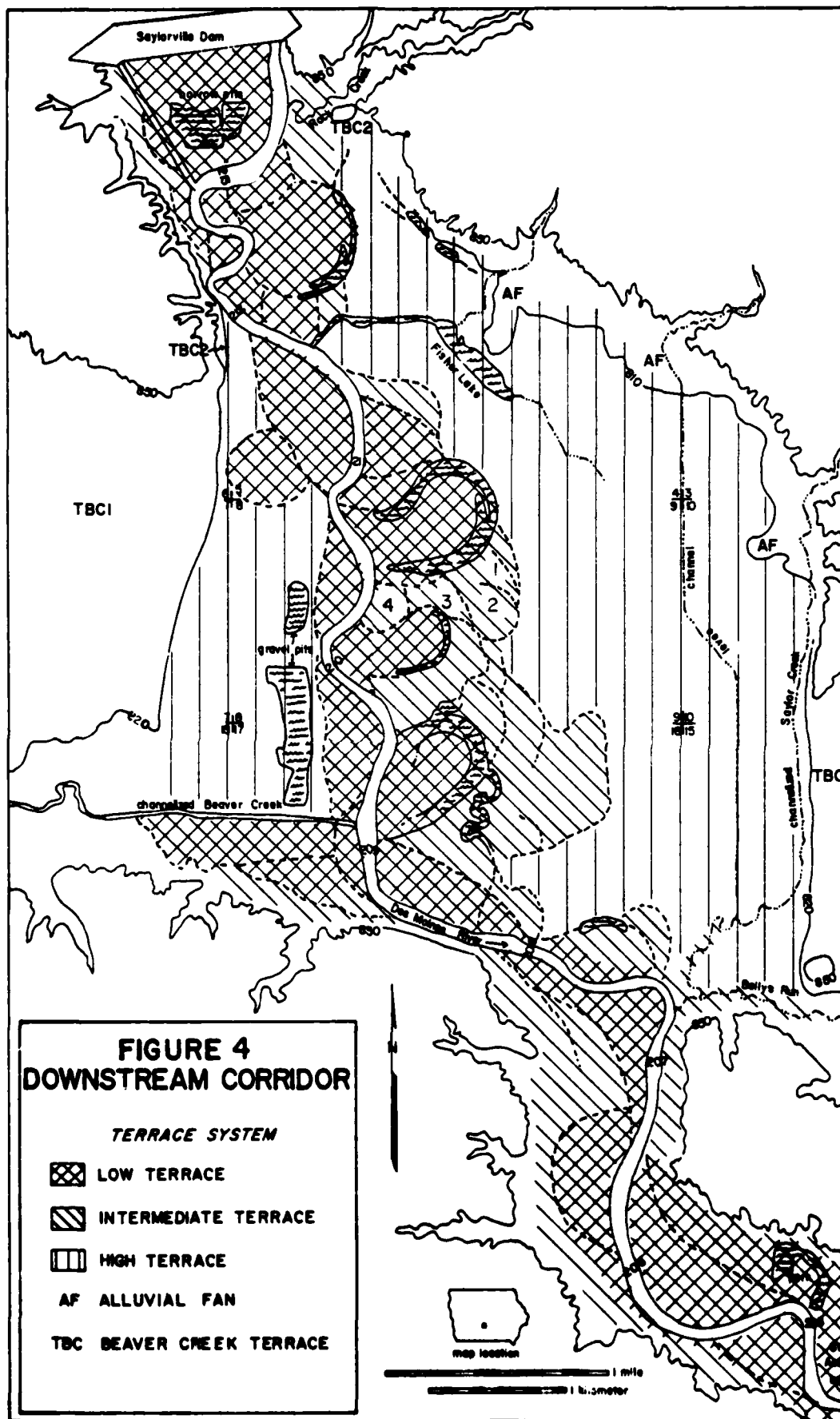
Previous Investigations

Nearly all of the archaeological investigations pertinent to this report have been conducted outside and mostly north of the Downstream Corridor, i.e. in the Saylorville Reservoir. The first Saylorville survey was conducted in 1962 (Ashworth and McKusick 1964), and the Smithsonian Institution River Basin Survey did some work in 1966 (Brown 1966). Since then personnel of Iowa State University in cooperation with the National Park Service and the Corps of Engineers have been conducting surveys, testing, and site salvage in and around the reservoir (e.g. Gradwohl and Osborn 1973; Gradwohl 1974; Osborn, Gradwohl, and Thies 1978; Timberlake 1981; Osborn and Gradwohl 1981). Almost all of this work has concentrated on sites outside of the present meander belt, although intensive testing at 13PK149 (Osborn and Gradwohl 1981:99) did involve some geomorphic analysis of the depositional stratigraphy. No systematic study of the post-Pleistocene landforms in Saylorville Reservoir has been undertaken in conjunction with previous archaeological investigations.

There have been two archaeological investigations in the Downstream Corridor. A survey conducted in 1975 during a period of high water located one site, 13PK204, on a T11-2 terrace (Weichman, Osborn, and Mills 1975). This site could not be relocated in 1981, when an intensive archaeological and geomorphological survey of the Corridor was conducted by Benn and Bettis (1981). The 1981 survey focused on locating sites in their geomorphic contexts for the purpose of reconstructing the late Pleistocene and Holocene depositional history of the Des Moines valley.

Review of Downstream Corridor Geomorphic Contexts

The project area (Figure 4) encompasses the lands held by the U.S. Army Corps of Engineers downstream from Saylorville Dam to the Sixth Avenue bridge in Des Moines, Iowa. This area includes a 9-mile reach of the Des Moines River and valley floor lying below elevations of 820 feet above mean sea level (asl) at the north end and approximately 798 feet asl at the south (downstream) end of the area. Three major tributaries enter the Des Moines River within this reach. Rock Creek enters from the east on the north end of the project area, Beaver Creek enters from the west in



approximately the center of the area, and the combined Saylor and Baily's creeks enter from the east about 1.5 river miles below Beaver Creek.

There are really two valley configurations within the reach of the Downstream Corridor. At the north end where the Saylorville Dam is constructed and in the south one-third of the project area the valley is approximately three-quarters of a mile (1.25 km) wide. Here, the river has meandered enough recently to leave only a few remnants of prehistoric terraces. The central one-half of the project area is about 2.5 miles (4.2 km) across. This considerable valley width is not a Holocene feature, rather it is the outwash valley of the Late Pleistocene "Beaver Creek" which flowed transversely across the present-day valley. This fortunate concurrence of events provides an unusually wide valley where several Holocene terraces are preserved for study.

Archaeological survey and some drilling in the project area resulted in the discovery of 27 archaeological sites and 12 historic structures. Sites ranged in size from large scatters of prehistoric debris or historic trash to isolated finds of fire-cracked rocks, flakes, or cultural features. No incidence of human evidence was overlooked, because the on-going processes of alluviation have left little human debris on the ground surface. In fact, the 27 archaeological sites represent only a very small sample of all of the sites present on the valley floor. Most are buried in voluminous terraces and are virtually invisible to any sort of intensive survey or subsurface probing.

Late Pleistocene Sediments:

The downstream end of the project area at the Sixth Avenue bridge is approximately 1 mile north of the terminus of the Des Moines lobe, the last Wisconsin drift sheet to cover north-central Iowa (Ruhe 1969). Much of the Des Moines valley was cut prior to the last glaciation and was partially exhumed following retreat of Des Moines lobe ice from the area. The valley is cut into Pennsylvanian bedrock (Lemish and Palmquist 1980) consisting primarily of shale, coal, sandstone, and limestone. As the Des Moines lobe ice retreated between 14,000 and 13,000 years ago, large volumes of meltwater were carried down Beaver Creek valley across the central portion of the project area and through a now abandoned channel east of Highland Park and Capitol Hill in Des Moines (Figure 5). Finer fractions of the outwash--silts and clays--were washed downstream while sand and gravel accumulated on the late glacial valley floor. Coarse outwash continued to accumulate until the valley floor reached about an 830-foot elevation, i.e. the level of sag in the now-abandoned Beaver Creek glacial valley. Meltwater eventually topped the divide, and the present-day Des Moines valley was cut west of the former valley, spilling water into the Raccoon River valley to the south.

Downcutting of the Des Moines River through the gorge left the former valley floor as a terrace, Beaver Creek 1 (TBC1), above the new valley floor. The Beaver Creek 1 outwash channel is bisected by the Des Moines River valley today. A portion of it (Figure 4) lies west of the present

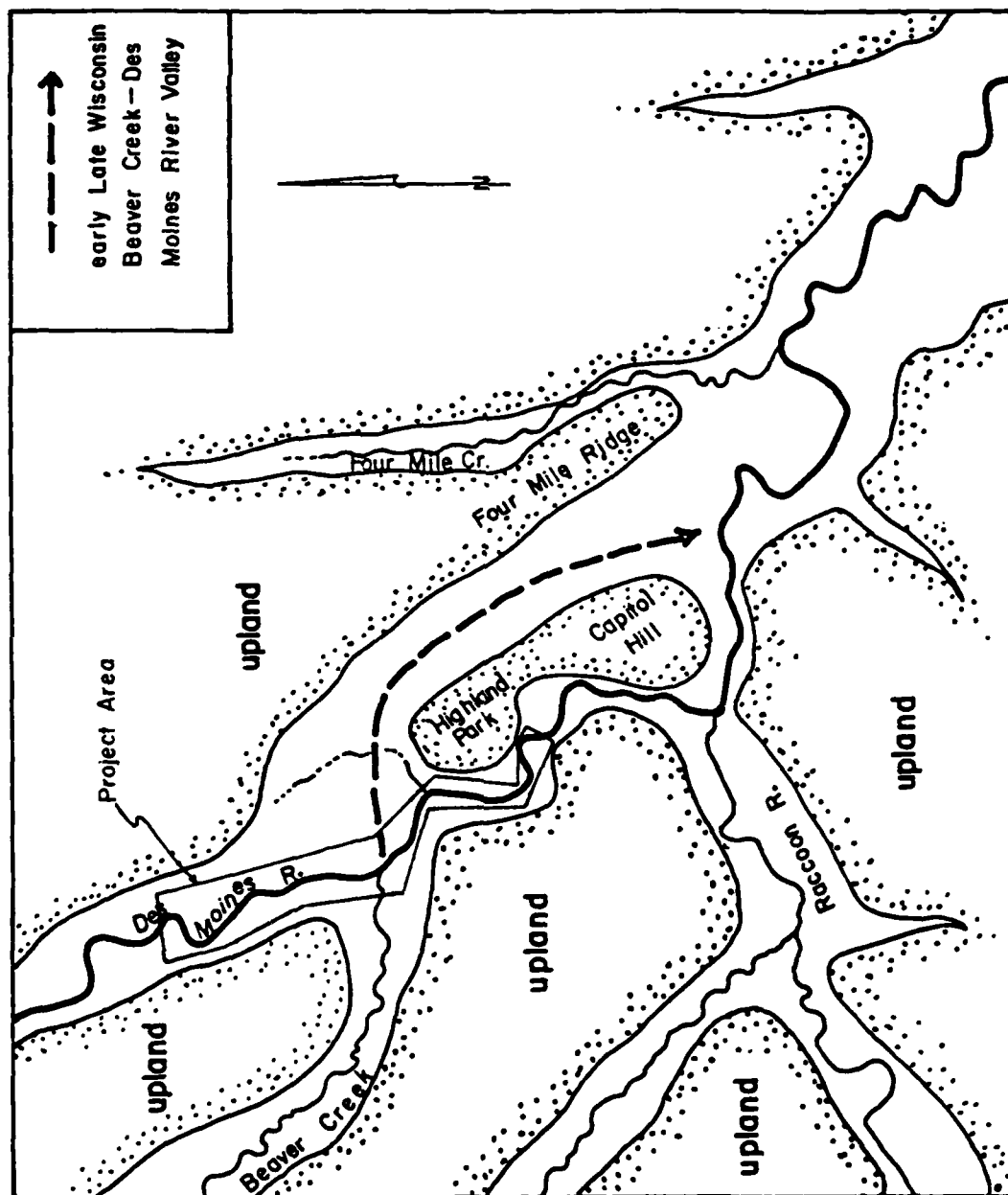


Figure 5. Schematic of physiographic features and Late Pleistocene drainage in the vicinity of Des Moines, Iowa (after Lees 1914).

valley, the 820-foot terrace contour on which the town of Johnston is built, while the remainder is east of the present valley between Capitol Hill and Four Mile Ridge. Both of these areas are underlain by up to 15 meters of sand and gravel deposited during the earliest stages of Des Moines Lobe ice retreat from central Iowa.

As the river began to adjust to its new course through the gorge alluviation occurred upstream of the gorge. By this time Des Moines Lobe ice had retreated to a position well north of the project area, possibly the ice front position represented by the Algona Moraine north of Fort Dodge, Iowa (Ruhe 1969). Since the ice front was farther from this section of the valley than it had been during construction of the Beaver Creek 1 terrace, the outwash deposited was finer textured, consisting primarily of silts and sands. This floodplain continued to aggrade until it reached an elevation of approximately 820 feet. Sometime after reaching this elevation, the river began to downcut again, leaving this latest Pleistocene floodplain as a terrace, herein referred to as Beaver Creek 2 (TBC2). Small remnants of the TBC2 terrace are present today along the western valley wall south of the Saylorville Dam. An exposure cut into the post-Beaver Creek 1 outwash floodplain is present on the right bank of the Des Moines River, a locality known locally as Rockaway Park. Here 7 meters of stratified silt, sand, and gravel overlie Pennsylvanian bedrock. A log collected from a sand lens 76 centimeters above the bedrock yielded a C-14 date of 12,160 $\pm$ 80 B.P. (10,210 B.C. Beta-2632; Table 1). This date agrees well with other dates from outwash associated with the Algona Moraine (see Kemmis, Hallberg, and Luttenegger 1981:Table 1).

At the close of the Wisconsinan about 10,500 years ago the valley floor was occupied by a downcutting, meandering river which flowed in a narrow meander belt along the eastern valley wall. The bulk of the valley floor was covered by the Beaver Creek 2 outwash terrace, which stood 3 to 4 meters above the early Holocene meander belt. The TBC1-2 surfaces were available for occupation by Paleo-Indians and Early Archaic peoples, and the remains of Early Man would have been incorporated in these terraces as they accumulated. Most of the TBC2 terrace and parts of TBC1 were destroyed by lateral migration of the Des Moines River after ca. 8,500 B.P. Obviously, many early sites were destroyed as well. Survey information from the valley north of the Saylorville Dam (in Gradwohl and Osborn 1973, 1974) indicates that lanceolate projectile points of Early Archaic and late Paleo-Indian ages are found only on outwash terraces comparable to the TBC1-2 terrace complex. Later sites also are present on the surfaces of outwash terraces.

The High Terrace and Alluvial Fans:

During the Holocene the Des Moines River has not had the competence to erode the Wisconsinan sands and gravels to any great extent and, therefore, has relied on meandering and lateral migration of the channel and meander belt to adjust its gradient. A relatively small amount of net degradation has occurred since the mid-Holocene, resulting in the

Table 1

Radiocarbon Dates
Downstream Corridor 1981-82

<u>Lab</u>	<u>Context</u>	<u>Uncorrected Date</u>		<u>Corrected Date*</u>	<u>Comments</u>
Beta-2632	TBC2 terrace	12,160 $\pm$ 80 B.P.	10,210 B.C.	-	uncarbonized conifer logs in silts and gravel (outwash) ca. 4 m below surface
Beta-2634	TH terrace 13PK414	5,190 $\pm$ 100 B.P.**	3,240 B.C.	4040 B.C.	scattered wood charcoal in B horizon ca. 1.6 m below surface
Beta-2633	TI4 terrace 13PK407	1,130 $\pm$ 80 B.P.	A.D. 820	A.D. 840	wood charcoal lens ca. 1 m below plowzone (Woodland component?)
Beta-5231	TI4 terrace 13PK407 T.U.1e	700 $\pm$ 140 B.P.**	A.D. 1250	A.D. 1240	unidentifiable wood charcoal, fea. 3, 100 cm below surface in lower Ab horizon (Oneota sherd associated)
Beta-4925	TI4 terrace 13PK407 T.U. 9	235 $\pm$ 95 B.P.	A.D. 1715	-	elm carbon (<i>Ulmus</i> sp.) associated with Oneota vessel, 54-57 cm
Beta-5230	TI terrace 13PK405 T.U. 4	210 $\pm$ 50 B.P.	A.D. 1740	-	carbonized elm log in Ab horizon, 50-53 cm
Beta-4734	TL terrace 13PK424-s	420 $\pm$ 50 B.P.	A.D. 1530	A.D. 1495	elm charcoal lens in Ab horizon ca. 140 cm below surface

* after Damon et al. 1974

** large statistical errors result from very small carbon samples

topographic separation of the two lowest terrace levels from the highest level. Three major Holocene valley surfaces, designated High (TH), Intermediate (TI), and Low (TL) terraces, were identified in the project area (Figure 4). These surfaces were distinguished on the basis of elevation, morphology, and soil profile development (Scully and Arnold 1979, 1981). All of these surfaces have evolved during the last 10,500 years, the Holocene period, and are underlain by thick sands and gravels deposited during the Late Wisconsinan.

During the Early and Middle Holocene the meander belt continued to migrate across the valley floor, destroying the Beaver Creek 2 terrace in the process. A substantial portion of the High terrace could have been formed over most of the valley floor. By ca. 5,000 B.P. the river had formed a meander belt against the west valley wall, where its westward migration was halted by coarse deposits making up the Beaver Creek 1 terrace and by bedrock along the valley margin. By the end of the High terrace formation sequence the river had settled into a mid-valley meander belt and abandoned a backswamp formation along the east side of the valley. These poorly drained deposits on the east side of the valley have been drained by a levee channel, channelizing Saylor Creek, draining and modifying Fisher Lake, and diverting Rock Creek away from its southward drainage and into the present river channel (all occurred during the nineteenth and twentieth centuries).

The High terrace occupies the bulk of the valley floor between river miles 208 and 213, but is not present below mile 207. This terrace is present on both sides of the Des Moines river. Its average elevation is about 1 to 1.5 meters higher than the Intermediate terrace level. One natural exposure of High Terrace sediments is present in the project area along the left (eastern) bank of the Des Moines River just upstream from the Sycamore Bridge. Here, about 3 meters of silt loam overbank sediments bury sands and fine gravels. A thick Mollisol developed in the upper part of these deposits. A buried soil surface containing burn features (13PK414) is evident between 160 and 170 centimeters below the present land surface in the lower portion of the vertical accretion (overbank) deposits along this exposure. Charcoal associated with this buried surface yielded a C-14 date of 5,190±100 B.P.: 3,240* B.C. (Beta-2634; Table 1).

Theoretically, cultural materials from the Early and Middle Archaic periods might be buried anywhere in the sediments of the TH terrace system. Sites of this type were found in the project area (13PK414, -419), although no diagnostic materials were recovered. Late Archaic and Woodland sites would be expected to appear higher in the TH sediments, for instance near the A-B soil horizon interface (13PK402, -403) or nearer the surface of the A horizon (13PK400, -401, -412, -413, -415, -416, -421). Indeed, 13PK413 and 13PK415 in the A horizon of the TH terrace did yield Woodland ceramics. Because the TH terrace in the east side of the valley was more poorly

*not corrected

drained than the center of the valley, we would anticipate that Late Archaic and Woodland sites would not be found in this area. Rather, if the poorly drained area was a swamp attracting waterfowl and aquatic life, then late Holocene sites would be situated on the fans and in the center of the valley to take advantage of the proximity of such resources. Presumably some Archaic sites (e.g. 13PK414) on the western edge of the TH terrace have been destroyed by subsequent river migration and TI terrace building. Presently, an analogous historic settlement pattern can be seen in the Des Moines valley; i.e. the village of Saylorville is situated on the eastern bluffs and fans, there are numerous farmsteads along NW 26th Street (the eastern Downstream Corridor boundary) on the western TH terrace, and the intervening TH terrace has been drained and cultivated.

Alluvial fans are present at the mouths of small tributaries along the eastern valley wall (Figure 4). Construction of State Highway 405 trenched portions of several of these fans and showed that they bury and partially merge with the High terrace. No datable material was found associated with these fans (very little time was allowed for their examination), but an alluvial fan in a tributary to the Skunk River about 25 kilometers northeast of the project area contains artifacts dating from the early to mid-Holocene (Abbott and Bettis 1975). Investigations conducted by Hoyer (1980) and others in western Iowa have demonstrated that alluvial fan development began about 8,500 years ago and terminated about 2,500 years ago (Bettis and Thompson 1981). These lines of evidence suggest that alluvial fan development was roughly contemporaneous in western and central Iowa starting in the early Holocene and ending during the late-middle Holocene (Bettis 1980). Since the fans east of the project area merge with as well as bury the High terrace sediments, the High terrace and fans must be roughly equivalent in age. A C-14 date of $5,190 \pm 100$ B.P.:3240 B.C. (Beta-2634) from charcoal in High terrace overbank deposits supports this interpretation.

If alluvial fans actually date to the age just referenced, then buried surfaces within the fans will have cultural remains of late Paleo-Indian to Middle Archaic age (see Anderson and Semken, eds. 1980). Late Archaic, Woodland, and later cultural remains will be found nearer the surfaces of fans, as is the case at the Koster site in Illinois (cf. Butzer 1977).

Tributary Stream Terraces:

In the 500 meters of the course of Rock Creek above its Des Moines River confluence there are at least two terraces above the floodplain. On the north side of Rock Creek the lower terrace has an elevation of 812 feet, the elevation of a TI terrace nearby, and the higher terrace has an elevation of 817 feet, nearly the same as a nearby TH terrace. The higher terrace also has a small alluvial fan encroaching on it. An Archaic age artifact was found on the surface of the higher terrace at this location, and materials believed to be of Woodland age are deposited in the A-B soil horizon interface (13PK410). Despite the absence of hard

evidence, it is conceivable that the two Rock Creek terraces correspond to the TI and TH river terraces. The well-drained alluvial terraces and much higher outwash terraces at the mouths of small tributary streams like Rock Creek offered comfortable, well protected habitation sites for prehistoric peoples.

Intermediate Terraces:

During the early Late Holocene (ca. 4,000 B.P.) the Des Moines River began a minor downcutting episode and developed a new meander belt about 1 to 1.5 meters below the level of the early Holocene floodplain (the current High terrace). The eastern margin of this new floodplain was in the position indicated by the eastern border of the Intermediate terrace today. Four distinct levels labeled I-4 through I-1 in order of increasing age (Figure 4) are present in this portion of the Intermediate terrace. On comparable landscape positions (point bars, for example) a soil development sequence is present. Entisols and Inceptisols are associated with I-4 and I-3 and Mollisols with levels I-2 and I-1. The soils on I-2 and I-1 are similar to those on the High terrace but have discontinuous cutans in their B horizons rather than the almost-continuous to continuous cutans found in the B horizons on the High terrace. Depth to carbonates on levels I-1 through I-3 is similar to that on the High terrace but is more variable as indicated by a larger standard deviation. Level I-4 has carbonates at much shallower depths than the rest of the TI terraces (3-1).

The Intermediate terrace was developing between approximately 4,000 and 1,000 years ago. The older limiting date is extrapolated from the High terrace date and the younger date is from charcoal collected from 13PK407 100 to 105 centimeters below the present surface (1,130 $\pm$ 80 B.P.: A.D. 820) (Beta-2633, Table 1) just above the contact between vertical and lateral accretion deposits (Leopold, Wolman and Miller 1964) on level I-4. Additional support for the conclusion that the Intermediate terrace was developing this late is the presence of a buried Oneota site (13PK407) probably dating between A.D. 1000 and 1,200 (950 to 750 B.P.) (Gradwohl 1974). Levels I-3 and I-4 are still accreting. Several exposures and soil cores show .3 to 1 meter of sandy loam sediments with little or no soil development burying a soil developed on the prehistoric I-3 or I-4 surface. This is the situation at 13PK407, where an historic Oneota component dating 235 $\pm$ 95 B.P.: A.D. 1715 (Beta-4925) overlies the Oneota component just described. A similar situation is present at 13PK405, a Woodland site, where terrace overburden contains twentieth century artifacts. We believe that the TI1 and TH terrace systems are processually related and that there is no large time gap between them. Thus, we propose that approximately 4,000 B.P. was the end of TH terrace formation and the beginning of TI terrace formation. This hypothesis might be confirmed by excavations at 13PK149, a multicomponent site north of the Saylorville Dam (Timberlake 1981). Here, a surficial Late Woodland component was radiocarbon dated at 840 $\pm$ 50 B.P.: A.D. 1110 (Wis-879), and components buried in the lower, sandier deposits were assayed at 3045 $\pm$ 65 B.P.: 1095 B.C. (Wis-880) and 3095 $\pm$ 65 B.P.: 1145 B.C. (Wis-901) (Timberlake 1981). It is likely that 13PK149 was on a TI terrace.

Prehistoric cultural components are distributed throughout the TI terrace system. A total of 14 sites was discovered on 490 acres in the Downstream Corridor. Considering the great extent of buried soils and the high frequency of recent overlapping deposits on TI terraces, we are certain that 14 sites is a very small sample of all the sites that must exist. Sites are distributed in and on the TI terraces in patterns similar to those of the TH terrace. For instance, of the 14 sites 11 are situated on the surface of the terrace, and 5 sites are buried in the terrace (not inclusive of sites buried by recent overlapping deposits). In general, we conclude that sites on the younger TI terraces are not more easily located than sites on the older TH terrace. From the evidence of sites that are currently eroding (e.g. 13PK405, 13PK407) it is also clear that many late prehistoric sites on TI terraces have been destroyed by river migration.

Low Terraces:

Sometime after 1,000 years ago the Des Moines River occupied several large meanders which were abandoned by A.D. 1846. These became the new floodplain, or Low terrace, which was covered with floodplain forest and flooded on a regular basis. At river mile 210.5 the TL elevations vary between 795 to 799 feet. The 4-foot discrepancy is accounted by the way in which the river is building the terrace: i.e. the 795-foot elevation represents the surface of the point bar after the meander was abandoned, and elevations up to 799 feet are overbank sediments and natural levees left by floods. These attributes of the TL terrace are analogous to attributes comprising the TI terrace system, thus showing parallelism in processes of terrace formation during the Holocene. Soils on the Low terrace are Entisols with some organic accumulation, weak structural development, and no B horizon development.

Low terrace surfaces are very late prehistoric to recent in age. As mentioned previously, deposits equivalent in age to the Low terrace frequently bury Intermediate terrace levels 3 and 4. The abandoned channel associated with the Low terrace on the south end of 13PK407 truncates the soil surface containing the Christenson Oneota Site (13PK407) and, therefore, must be younger than the site, ca. A.D. 1715 (Beta-4925). A single radiocarbon date of 420 $\pm$ 50 B.P.: A.D. 1530 (Beta 4734) from the soil buried beneath 1 meter of sand at 13PK424 seems to mark the beginning of TL formation.

Late prehistoric and protohistoric cultural remains are very rare in Low terrace sediments in the Downstream Corridor. An Oneota site (13PK407) is the only protohistoric site we found, and this site is in the late deposits of a TI4 terrace. We do not know if the paucity of late sites is reflective of a true settlement pattern, or whether enormous volumes of overbank sediments mask earlier surfaces on TL terraces. We believe that many late prehistoric sites will remain invisible to most archaeological survey techniques, short of extensive machine trenching of floodplains. Additionally, in meandering river systems many later sites will have been destroyed by erosion.

Historic cultural remains in the Downstream Corridor do not have the same distributional patterns as prehistoric remains. Five concentrations of historic trash were found on the surfaces of most prehistoric terraces, TI4-1 and TH, and the writers noted modern trash piles accumulating on many scarps throughout the project area. However, evidence of house structures from historic records and existing foundations demonstrates that higher elevations were usually selected for buildings; for instance, two or three houses on TL terraces were placed on made-land, and seven other houses are on TH or TII terraces. Historic properties on high elevations have not been subjected to burial by river alluvium.

III

RESEARCH OBJECTIVES AND METHODOLOGY

Objectives

The overall concern of this project is to assess the significance of a selected group of 9 archaeological sites that are being impacted by various destructive forces (see Appendices I and II). In terms of "pure" research this group of sites is not the best selection for answering the most pressing problems about prehistoric human occupation in the central Des Moines River valley. Groups of sites chosen because of the exigencies of the contracting procedure and available funds rarely are the most fulfilling research subjects. The opportunities for finding scientific value in the sample of 9 sites are expanded by having an established epistemological procedure for the investigations. That procedure, initiated with the 1981 survey of the Downstream Corridor (Benn and Bettis 1981:1), assumes that alluvial sediments are a dynamic environment for archaeological deposits. The fluvial processes that are changing the present-day floodplain (e.g. bank erosion, point bar deposition, channel meandering, aggradation) have always been at work. Locating and assessing cultural resources in this context is determined by the ability to analyze and understand the systematic evidence of past fluvial activities. Geomorphic models of past fluvial activities, like the model presented in the previous chapter, are essential elements of epistemology. Two assumptions also are essential to this approach.

We assume that an alluvial landscape has three dimensions and that this volume must be analyzed as the context for cultural remains at the time of the archaeological investigation, not as an afterthought (see Bettis and Thompson 1981). Looking at the alluvial surface will provide data representative of only the most recent depositional event(s), cultural and sedimentological. Alluvial volumes must be visualized as structural strata that are superimposed in logical patterns. Once the overall alluvial sequence is known, individual strata can be penetrated by drilling and by hand excavation to investigate their internal structure, developmental history and distribution.

A second assumption concerns a theoretical perception of the fluvial system. It is the view that climate, hydrology, and vegetation to produce threshold changes in episodic fashion (Schumm 1973, 1976; Knox 1976). Put another way, "complex response" refers to occurrences of deposition and erosion which are related throughout a watershed as a result of the delayed transmission of information (Schumm 1976:76). A geomorphic "threshold" is a sudden adjustment in the system resulting from change in some part of the system.

Within a complex natural fluvial system, one event can trigger a complex reaction (morphologic and/or stratigraphic) as the components of the system respond progressively to change. This principle provides an explanation of the complexities of the alluvial chronologies, and it suggests that an infrequent event, although performing little of the total work within a drainage system, may, in fact, be the catalyst that causes the crossing of a geomorphic threshold and the triggering of a complex sequence of events that will produce significant landscape modification (Schumm 1973:307).

The concept of complex response, as described by Schumm, has profound applications for interpretation of the archaeological record. First, systemic changes triggering fluvial adjustments also affect local or regional conditions of environments exploited by humans; the fluvial adjustments or the cultural responses may have been minor or of more profound nature than are illustrated in the stratigraphic record of fluvial sediments and cultural deposits. Secondly, the order and magnitude of fluvial responses would have rendered more or less land fit for human use over longer or shorter periods of time and would have similarly determined the extent of the preservation of human remains.

Because the same archaeologist and geomorphologist (i.e. Benn and Bettis) did the initial survey of the Downstream Corridor, the testing herein described is viewed as a continuation of the long-term process of studying the cultural resources and geomorphic history of the central Des Moines River valley. The survey (Phase I) resulted in the formulation of a preliminary Holocene landscape model and predictions about where cultural deposits were preserved in that landscape (Chapter II). The Phase II testing program is directed toward determining how a non-random sample of sites came to be preserved in the alluvial landscape. In particular, we are concerned with testing the propositions: a) Are the survey predictions concerning landscape positioning and stratification of sites correct? b) Are site positioning and preservation systematic and therefore predictable? c) Can the Downstream Corridor findings be applied to other (already) excavated sites in the vicinity (cf. Osborn and Gradwohl 1981), i.e. reinterpret other sites according to the new model of landscape evolution? A related research problem that we propose to address through site testing is the evaluation of methods for testing sites in alluvial landscapes. Specifically, we are interested in what methods of testing (e.g. hand excavation, machine excavation, bank profiling, size and depth of test units) are advantageous for determining the physical parameters sites.

The "project proposal" (Appendix II) included eight other research problems that are intended for scrutiny in the Downstream testing project. These problems depart from the epistemology just discussed, primarily because they are ostensibly cultural questions (Appendix II):

- (4) What is the nature of 14PK414, a Middle Archaic site, and can we expect it to be typical of buried sites in the Des Moines valley?

- (5) How were prehistoric sites located along the Des Moines River (i.e. on banks, terraces, point bars), and how often (seasonally) were they occupied?
- (6) What was the nature of Oneota occupation north of Des Moines, and how did Oneota peoples interact with Great Oasis, if at all?
- (7) Does the Downstream Corridor contain "aceramic" Woodland sites; if so, what part of the settlement pattern do they represent?
- (8) Is there evidence of a relationship between Woodland ceramic wares and Great Oasis?
- (9) Is there significant negative evidence for Middle Woodland period occupations in the Downstream Corridor floodplain?
- (10) Is there evidence (e.g. settlements, artifact assemblages) for a significant economic change between A.D. 400-800, the period when horticulture changed economies?
- (11) What natural and cultural factors might influence the composition of macro- and micro-remains recovered by fine-screening and flotation techniques?

Methodology

A flexible fieldwork strategy was necessitated by rain and concomitant high water conditions encountered during the field season, particularly at 13PK405. The initial step involved confirmation of a site's existence by reconnoitering the vicinity and noting how much of the site remained or had been eroded away since the 1981 survey. Decisions concerning excavation procedures, given the water levels and amount of time to expend on each site, were made after this reconnaissance.

The river banks at the sites recorded during the 1981 survey were examined by the principal investigator and later by the geomorphologist to confirm the presence of a site. Again, high water delayed bank examination at some sites.

A surface collection of historic and possible prehistoric cultural material was made at 13PK409 to indicate the site's nature and approximate horizontal extent. All surface cultural material was collected at 13PK407 and 13PK410. Otherwise, dense vegetation prohibited surface collection on most sites.

In keeping with the purpose of the testing program, test units at each site were oriented to indicate potential site limits by determining the limits of the terrace structure. The units were spaced so as to provide information on site context, including cultural material, depth, associations, plus the state of preservation of cultural and biotic remains. The usual procedure was to place a line of 1-meter² test units across the site area at 20-meter intervals (except where prevented by surficial impediments: trees, low spots, etc.) and to place additional

units as necessary to elucidate the site's cultural and geomorphic context. The 1-meter² units were expanded to follow features and blocks of 3-6 units and were excavated in areas of feature concentrations at 13PK407 and 13PK413. A few units were also placed to excavate features observed in the river bank (13PK405, 13PK407).

In the procedure of excavating, a 1-meter² profile/control unit was excavated first; it provided stratigraphic information which was used in planning excavation of the other units. This profile unit was dug to 1 meter or more below the ground surface, and usually reached the lower B soil horizon and the sandy deposits near the base of the terrace. Units at 13PK407 could be excavated only to about 1-meter deep before water from saturated sediments ran into the units.

The excavation procedure concentrated on careful removal of the potential cultural bearing strata, the A and upper B soil horizons. These strata were removed either by shovel-skimming, which facilitates locating features by making clear horizontal cuts, or by troweling, which breaks up the soil and facilitates screening. Where possible the sites were excavated in reference to genetic soil horizons. Arbitrary 10-centimeter levels were used within the natural levels (except the plowzone, where present). Soil was screened through $\frac{1}{2}$ -inch mesh at 13PK405 and 13PK413. Elsewhere, attempts were made to screen the sediments, but the soil proved too wet to pass through the mesh. A more rapid excavation technique, vertical shovel skimming, was utilized in the lower B horizon of the profile units. In some units at 13PK407 and 13PK424 this technique also was used to remove historic period overburden.

Cultural features were troweled and cross-sectioned. (Cross-sectioning revealed some features to be natural.) Part or all fill from the well-defined features was retained for possible flotation or water screening. Plan views and cross sections of features were drawn.

Site maps were drawn using a transit and 30-meter tape. A permanent wooden datum stake was set in an undisturbed part of the site for future reference. Test units were plotted on Downstream Corridor project contour maps (2 ft contours) provided by the U.S. Army Corps of Engineers. Field notes were kept for the project and for each test unit. A photographic record of sites and features was maintained.

The geomorphologist visited sites to observe the banks, analyze test unit profiles, and collect soil samples for future sediment analysis. He also confirmed and amplified the soil descriptions and interpretations of terrace structure formulated by the principal investigator. At some sites (13PK407, 13PK414) he explored evidence of the terrace structure in greater detail by utilizing a hand soil auger.

The cultural and biotic material recovered from sites was processed at the laboratory of the Center for Archaeological Research, Southwest Missouri State University, Springfield, Missouri. The cultural material was washed and numbered by Patsy D. Corbett and analyzed by Benn. The feature samples were deflocculated (using Calgon) and/or floated and rough sorted by Corbett and Dona Key. Animal bone was identified by Benn and by

Holmes Semken, Jr., Department of Geology, University of Iowa. The botanical material was identified by Harris and Benn. Four radiocarbon samples were processed by Beta Analytic, Inc., Coral Gables, Florida.

The material recovered is labeled, stored in standard cardboard boxes, and curated at Luther College Archaeological Research Center, Decorah, Iowa, where materials from the 1981 survey also are stored. Photographs, field notes, maps and other records are filed at the Center for Archaeological Research, Springfield, Missouri.

Deviations from the Proposed Methodology

A comparison of the field methods and the "project proposal" (Appendix II) shows that some modifications were necessary to accomplish the site testing in 1982. The two major changes were: not screening excavated backdirt on some sites, and not undertaking some deep trenching with machines. Both methods were limited by wet ground conditions. Screening did not always work because the silty loam alluvial sediments were too sticky, and some trenching was prevented by a high water table.

We feel that little information was lost by not screening some deposits. The alluvial deposits at most sites were almost stonefree and of very fine fraction. Thus, "introduced" materials were easy to distinguish, if not always by eye then by ear as the trowel or shovel struck the object. Also, at sites where deposits were screened, very few items were discovered in the screens. Most were discovered in place by troweling or shovel-skimming.

The limiting of trenching had two effects. At shallow sites, such as 13PK407, a greater number of test units replaced the need for trenching. At 13PK407 the lack of trenching actually saved the small cultural deposit from partial destruction by the machine. At a deeper site, 13PK424, the absence of trenching prevented our probing for cultural materials, although 13PK424 did not produce any human cultural evidence anyway.

In addition to modifications caused by wet grounds, there were deviations in the amounts of time estimated for investigation of each site (Appendix IV). These were anticipated in the project planning, since no one really knew what was beneath each site. However, the total time spent testing sites (588.5 man hours) proved to be very close to the proposed estimate (588 hours).

IV

ARCHAEOLOGICAL SITE INVESTIGATIONS

Archaeological investigations conducted on nine Downstream Corridor sites are described on the following pages. Also, materials and site contexts are interpreted, and recommendations for future management of the sites addressed. Site locations are shown in Figure 6*.

13PK405 (Figures 7, 8)

location: Cultural materials are in the A soil horizon buried approximately 30 centimeters in a T1 terrace, elevation 794 feet. The site is in a forest opening at the end of a gravel access road (open by permission of the COE). The site and terrace are on the left side of the Des Moines River on the cutbank (outside) of a turn in the river approximately 100 meters north of the mouth of Saylor Creek. Estimated site size is less than $\frac{1}{2}$ acre.

description: In 1981 animal bones and a projectile point tip (Woodland) were found eroding from a 40-meter section of the river cutbank. Cultural materials came from a buried A horizon; another chert flake reported from the surface in 1981 is not aboriginal (i.e. it is quarry gravel). The site is sod-covered with occasional trees and one major motorcycle path. A veneer of alluvial silt and sand overlies the buried soil, and the silts and sands in turn are overlain by a dense layer of gravel, cinders, and twentieth century domestic trash.

collection: Five of 8 test units yielded twentieth century trash, but only two test units (7, 8) produced prehistoric material. Test units and levels not listed produced no cultural material.

river bank surface

8 animal bone frags.

test unit 1

0-10 cm rusted metal frags.
clay pigeon frags.

test unit 2

0-10 cm window glass frags.
2 clear bottle glass sherds
brick and tile frags.

*appended to report

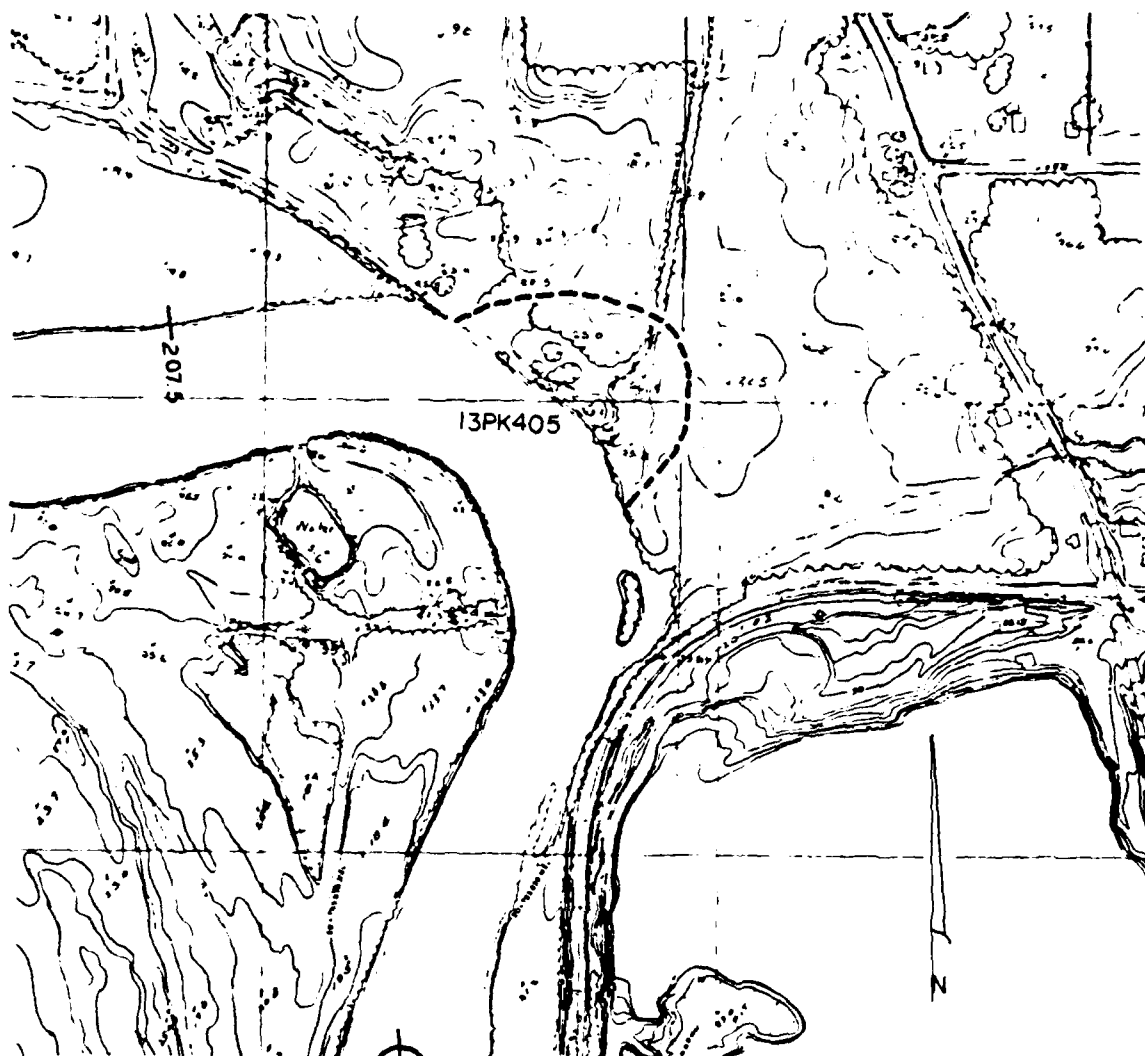
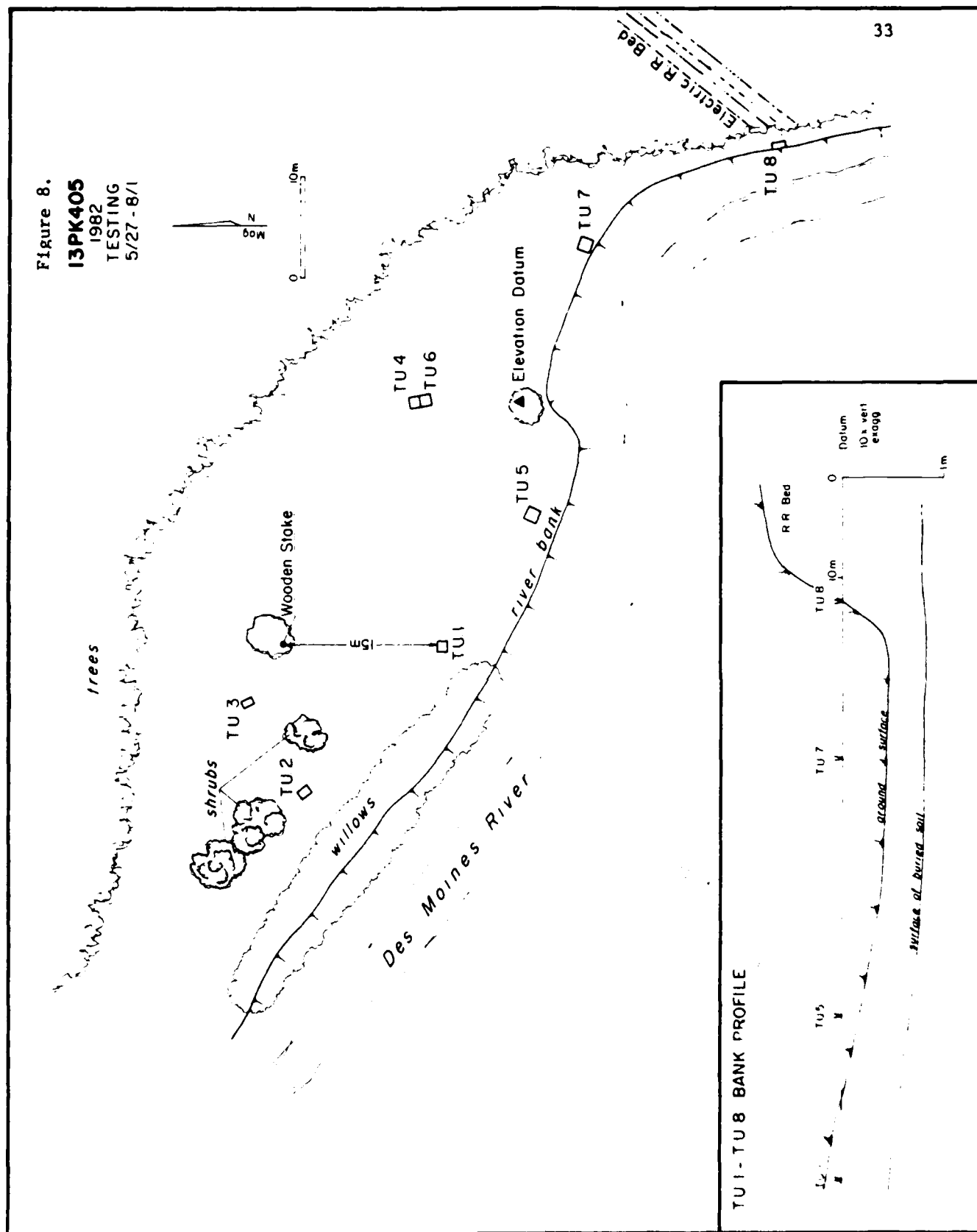


Figure 7. Site 13PK405 in the Downstream Corridor (contour 30'=800' asl; scale 1"-400').

Figure 8.
13PK405
 1982
 TESTING
 5/27-8/1



test unit 3

0-10 cm concrete frags.
 1 railroad spike
 clay pigeon frags.
 1 plastic frag.

test unit 4

0-10 cm rusted metal frags.
 bathroom fixture metal frag.
 1950s Hamm's beer can
 50-53 cm carbonized log (C14 date)

test unit 5

0-10 cm tile frag.
 2 nail frags.
 metal frags. (rusted)
 1 cup rim (late china)

test unit 7

0-10 cm soft drink bottle frags.
 40-50 cm 11 animal bone frags.
 50-60 cm 8 animal bone frags.
 1 prox. humerus frag. (deer)
 60-70 cm 1 animal bone frag.

test unit 8 (measurements from buried soil surface) .78 m below datum

10-20 cm 2 animal bone frags.
 20-30 cm 2 animal bone frags.
 30-40 cm 4 animal bone frags.

investigations: In late May, 5 1-meter test units were positioned in the center and in the 4 quadrants of the site (Figure 8). (Large patches of poison ivy restricted the positioning of test units.) Test units 2-5 were placed 15 to 23 meters from unit 1 at the center of the site. Excavations proceeded by shovel-skimming and hand sorting the damp soil. Historic layers down to the buried soil were excavated in natural levels; arbitrary 10-centimeter levels were employed to dig the buried soil. Test units 1-5 were backfilled at 50 to 60 centimeters when the river rose suddenly on May 27 (see Plate 1).

In early August the crew returned for three days and reopened test units 1, 3, and 5 to complete excavation. In addition, unit 6 was opened next to unit 4, and units 7 and 8 were excavated near the river bank where animal bones were discovered. Excavation was accomplished by shovel-skimming sterile layers and troweling and skimming cultural layers, with dirt from the buried soil horizon being screened through $\frac{1}{2}$ -inch mesh. Excavations were carried well into the sandy B horizon to the following depths: 90 cm in TU 1; 105 cm in TU 3; 83 cm in TU 5; 110 cm in TU 6; 90 cm in TU 7. Test unit 8 was positioned on the river bank so that only the buried soil horizon was excavated. The sandy overburden (i.e. the fill of the electric railroad bed) was removed from TU 8, and 10-centimeter levels 1-5 were excavated through the soil horizon by troweling and screening the dirt.

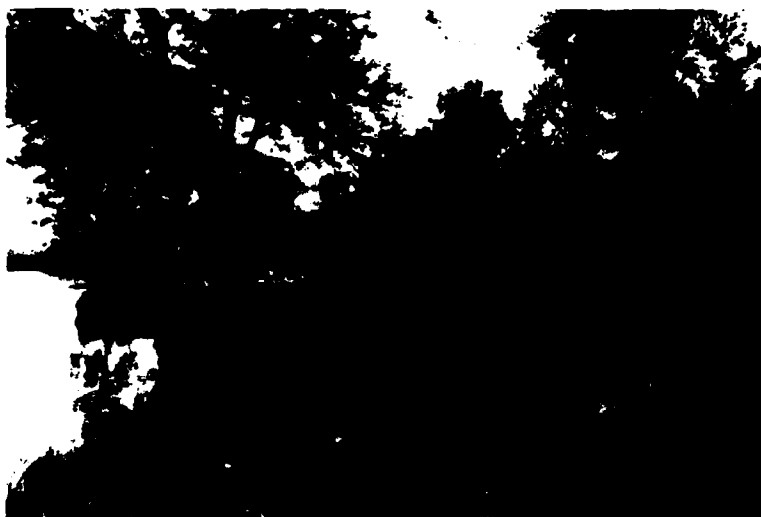


Plate 1. Site 13PK405 (view looking west) seen in late May as the Des Moines River was rising. Test units 1 and 5 are behind the large tree on the river bank.

One feature was located in TU 2. This was a 15-centimeter long, thin lens of burned earth and bits of charcoal situated at the top of the buried soil (ca. 35 cm below ground surface). No other cultural material was associated with this fired area.

A radiocarbon date of 210 ± 50 B.P.:A.D. 1740 (Beta-5230) was obtained from a carbonized elm (Ulmus cf. rubra) branch resting horizontally at 53 centimeters in TU 4. This depth is in the center of the buried soil and at the same level where animal bones were common in TU 7 and 8). Carbonized seeds from this layer (Table 2) are few in number and therefore not especially characteristic of any environment.

A vertical profile of the TI terrace at 13PK405 was described on the river bank at the location of TU 7. That description is essentially the same for profiles in all other test units.

13PK405 bank profile (TU #7)

landscape position: Intermediate terrace just upstream of junction of Saylor Creek with Des Moines River, floodplain.

parent material: alluvium

slope: 0-2%

vegetation: floodplain forest and sod

date described: 8/1/82

remarks: archaeological site 14PK405

depth (cm)	horizon	description
0-6	+	very dark grayish brown (10YR 3/2), loam, medium cloddy, friable, noneffervescent, abrupt smooth boundary, abundant roots, common fine to medium gravel, occasional metal and glass fragments
6-23	A ₁₁	very dark gray (10YR 3/1), loam, moderate fine columnar breaking to moderate fine angular blocky, friable, noneffervescent, clear smooth boundary, abundant roots
23-34	A ₁₂	very dark grayish brown (10YR 3/2), loam and occasional sand lenses, weak medium subangular blocky breaking to moderate fine subangular blocky, friable, noneffervescent, abrupt smooth boundary, common roots, common medium brown (10YR 4/3) mottles

depth (cm)	horizon	description
34-52	IIA _{1b}	very dark grayish brown to dark gray (10YR 3/2-4/1), loam, moderate fine subangular blocky, friable, noneffervescent, gradual smooth boundary, very few medium brown (7.5YR 4/4) concretions, common roots, common medium subhorizontal tubules
52-66	IIB _{1b}	very dark grayish brown (10YR 3/2), heavy loam, moderate fine angular blocky, friable, noneffervescent, gradual smooth boundary, very few thin discontinuous very dark gray (10YR 3/1) cutans
66-77	IIB _{2b}	very dark grayish brown (10YR 3/2), heavy loam, moderate fine angular blocky, friable, noneffervescent, clear smooth boundary, common thin almost continuous very dark gray to dark gray (10YR 3/1-4/1) cutans, common medium vertical tubules
77-91	IIB ₃	dark grayish brown (10YR 4/2) loam, weak medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common thin discontinuous very dark grayish brown (10YR 3/2) cutans, tubules as above
91-113	IIBC	brown (10YR 5/3), sandy loam, weak coarse subangular blocky, friable, noneffervescent, abrupt wavy boundary, common medium vertical pores with continuous very dark grayish brown (10YR 3/2) clay coatings
113-base of exposure (130)	IIIC	brown to pale brown (10YR 5/3-6/3), medium sand and fine gravel, single grain, loose, noneffervescent

interpretations: There are two cultural components at 13PK405. The surface component is a mid-twentieth century accumulation of domestic trash and the early twentieth century electric railroad bed. The domestic trash came from at least three houses that local informants say were once on the site. The railroad bed crosses the southeast corner of the site, where bed fill extends down to the top of the buried soil (about 35 cm). The second component consists of animal (deer) bone fragments and the tip of a small projectile point deposited in the buried A soil horizon. Although the evidence in the second component is sparse, it seems to have functioned as an aboriginal hunting station at the very least.

Evidence of the aboriginal component was found only along the river bank (near TU 5 in 1981; at TU 7, 8 in 1982) and not inland. A careful search of the bank in 1982 failed to locate evidence of charcoal and bone flecks anywhere except on the extreme southeast corner of the site (Figure 8). Therefore it seems that almost all of the site has eroded into the river. Our informants stated that erosion on the east end of the site has been very rapid in the

last decade, taking perhaps 50 to 75 meters of the terrace in their memories. This estimate of terrace erosion seems appropriate, judging by the truncated position of the electric railroad bed.

The buried soil containing the aboriginal component was once the surface of the terrace. Wood charcoal from this soil (TU 4; Table 1) was radiocarbon dated at A.D. 1740 $\pm$ 50; however the charcoal was not directly associated with aboriginal cultural debris. The date is believed to document the age when silty-loam deposits were slowly accumulating as the mollic epipedon developed on the terrace. By obtaining the elevation of this buried soil surface and the present ground surface (Figure 8), we can see that site 13PK405 is situated on the east side of the apex of the point bar underlying the terrace. Also, the present ground surface is seen to dip (east) more rapidly than the buried soil surface, perhaps because dirt was borrowed from the site surface to construct the railroad bed.

recommendations: Site 13PK405 has been disturbed by construction of a railroad bed and by three or more houses. Presently, it is utilized by picnickers, boaters, fishermen, and motorcyclists as a stop-over. Most of the site has eroded into the river, and one or two more seasons of bank erosion will completely destroy it. In the future a vehicular access is planned for the road ("flint access") leading to the site. In sum, recent impacts have rendered the aboriginal deposit virtually useless for research, because the remaining portion is too small to confidently predict what the site once contained and how large it was. The historic component(s) is mid- to late twentieth century and is not considered significant enough for future research. The site does not meet the criteria for eligibility to the National Register of Historic Places. No additional investigation is recommended, and no bank protection is necessary to preserve cultural deposits on 13PK405. It should be recognized, however, that the T1 terrace at this location has the potential for containing other buried prehistoric sites, which could be impacted by future construction.

13PK407, Christenson site (Figures 9, 10)

location: Cultural components are buried above and within a buried A soil horizon in a T14 terrace. This location is at the western side of cultivated fields, although the site is presently in weeds. The site is situated on the left bank of the Des Moines River on the outside turn of a meander. Cultural features and materials are eroding along approximately 150 meters of river cutbank, but the primary section of the site extends along approximately 60 meters of bank. Estimated site size is 1½ acres.

description: In 1981 sporadic cultural features and materials were observed along the river bank: hearths, carbon lenses, "empty" pits, occasional bones and pottery sherds, and possible structure floors. Shell-tempered Oneota ceramics were found in a cultural component within an A soil

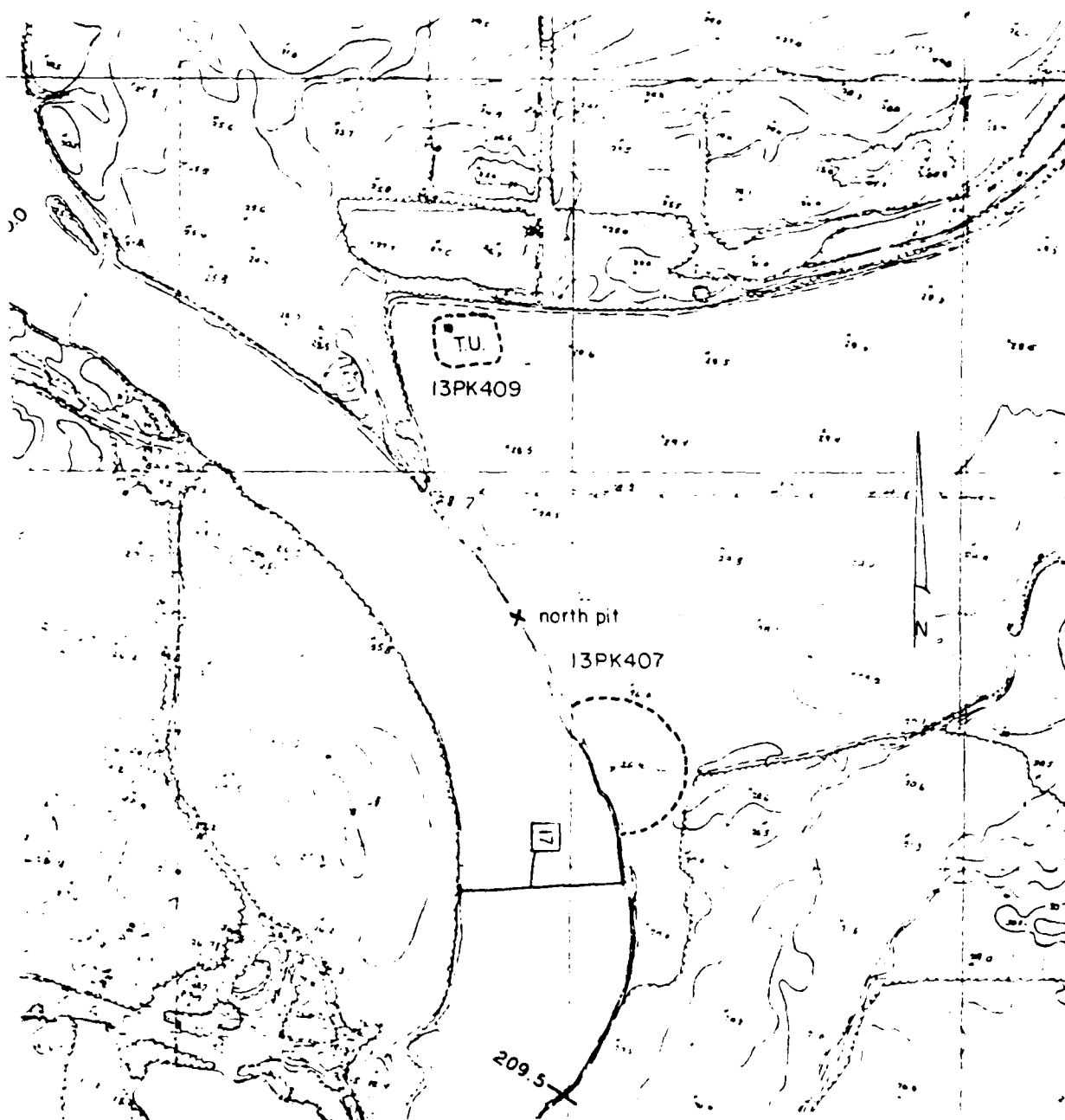


Figure 9. Sites in the Downstream Corridor (contour 30'=800' asl; scale 1"=400').

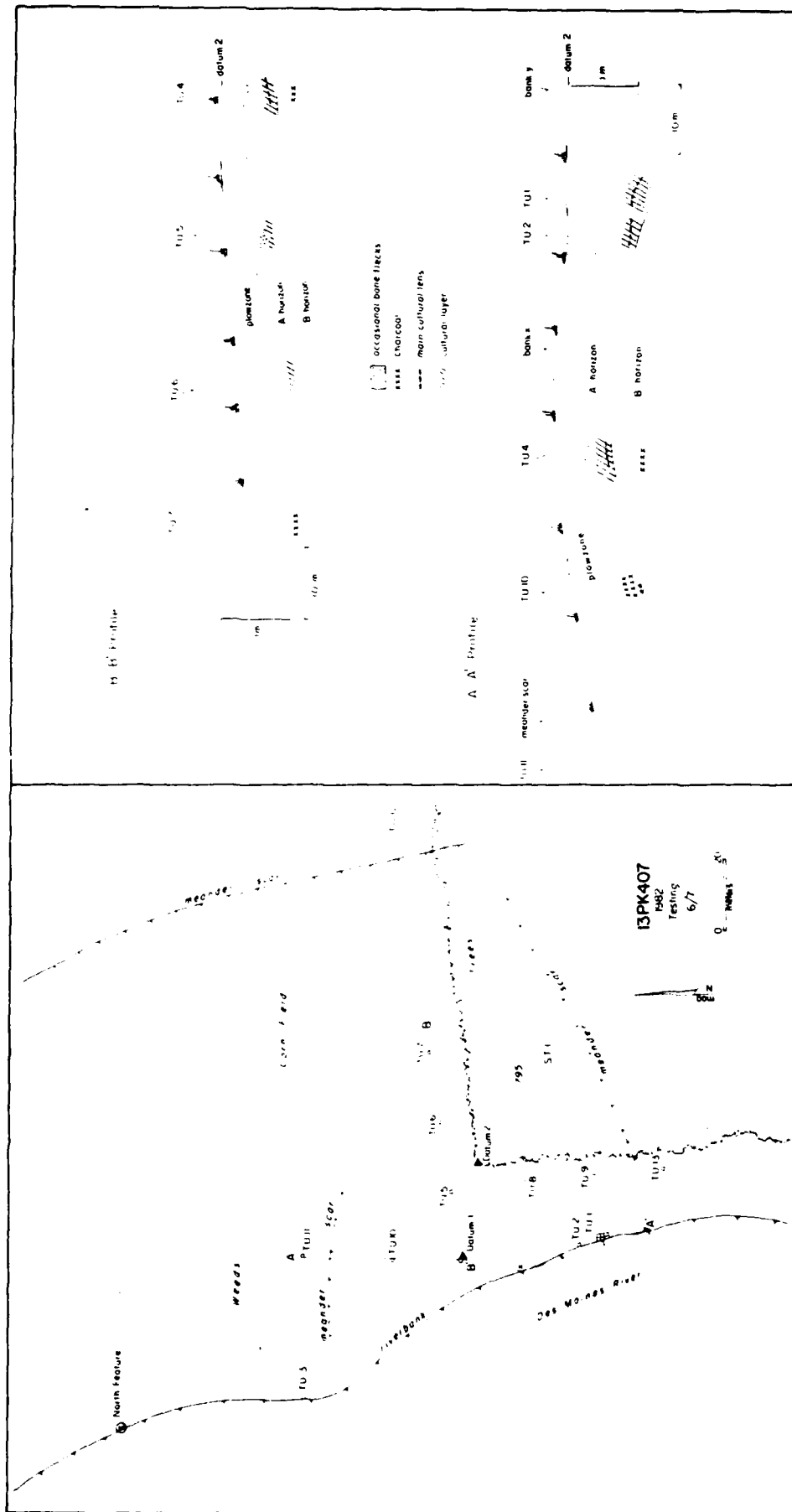


Figure 10.

horizon buried beneath 30-50 cm of alluvium and historic plowzone(s). Cultural features also were noted within the A horizon. At the south end of the site a lens of animal bones, fire-cracked cobbles, and charcoal was located approximately 130 centimeters beneath the ground surface (see Benn and Bettis 1981:21). A radiocarbon date from this charcoal lens is A.D. 820 $\pm$ 80 (see Table 1). The site location was characterized as a point bar with sediments (i.e. the buried soil) dipping to the north, south, and east (inland) from the center of the site on the river bank.

In 1982 our observations of the site were much the same, except that nearly all of the cultural evidence was found along 60 meters of river bank at the south end of the site. This portion of the site is subject to the most rapid bank erosion owing to the presence of an eddy in the river.

collection: Test units 1d, 7, 10, 11, 12, 13 and the shovel test hole did not yield cultural materials, although flecks of carbon were found in all units except 13.

river bank surface

- 1 Synaptomys cooperi rt. mandible (from pit feature at north end of site)
- 1 deer (O. virginianus) axis (from historic sediments at south end of site)

test unit 1a

- 90-100 cm 1 sandstone cobble frag.
- 1 river pebble
- 4 animal bone frags.

test unit 1b

- 50-60 cm 1 piece rusted wire
- 80-90 cm 1 animal bone frag.
- 1 prox. humerus (gray squirrel Scirpus carolinensis)
- 90-100 cm 2 animal bone frags.
- 100-110 cm 2 animal bone frags.
- 110-120 cm crumbling (fired) granite cobble

test unit 1c

- 30- 40 cm 1 rusted fence staple
- 1 rusted nail
- 40- 50 cm 1 rusted wire frag.
- 80- 90 cm 2 animal bone frags.
- 1 dist. frag. 1st or end phalange (deer, O. virginianus)
- 90-100 cm 1 lt. scapula frag, (deer)
- 1 (pelvis) frag.
- 1 cuboid (deer)
- 1 2nd phalange frag. (deer)

4 turtle shell frags. (carpace)
 frags. mussel shell
 9 burned bone frags.
 17 animal bone frags.
 1 exfoliated granite cobble

test unit 1e

100-110 cm 1 animal bone frag.
 100 cm C14 carbon from feature 3

test unit 1f

90-100 cm 9 animal bone frags.
 3 shell-tempered body sherds
 100-110 cm 1 shell-tempered body sherd

test unit 2

57- 60 cm charcoal and bone flecks
 90-100 cm 1 schist cobble
 15 animal bone frags.
 (1 burned)
 1 shell-tempered body sherd
 1 lt. calcaneum (immature deer)
 2 mussel shell valve frags.

test unit 3

53- 63 carbon flecks and soft bone frags.
 110-120 cm carbon and burned earth flecks

test unit 4

30- 40 cm 5 animal bone frags.
 40- 50 cm 2 animal bone frags.
 50- 60 cm 2 burned bone frags.
 1 fired clay lump
 60- 70 cm 5 burned bone frags.
 7 animal frags,
 70- 80 cm 5 burned bone frags.
 48 animal bone frags. (small)
 1 small mammal rib (raccoon?)
 1 lt. femur (raccoon P. lotor)
 1 rt. prox. femur (raccoon)
 2 unid. carpals
 1 raptor phalange frag. (burned)
 115-120 charcoal smear

test unit 5

0- 20 cm 1 clay pigeon frag.
 40- 50 cm 1 animal bone frag.
 50- 60 cm 1 animal bone frag.
 60- 70 cm 2 burned bone frags.
 1 animal bone frag.
 1 sesmoid (deer)
 1 prox. 2nd phalange
 (deer, burned)

test unit 6

60- 70 cm 1 burned bone frag.
 80- 90 cm 2 animal bone frags.

test unit 8

20- 30 cm 1 calcaneum frag.
 (wapiti C. canadensis)
 40- 50 cm 1 animal bone frag.

test unit 9

no provenience 1 animal bone frag.
 (50-70 cm) 1 shell-tempered body sherd
 30 cm charcoal concentration
 40-50 cm charcoal and burned earth flecks

50-60 cm (E $\frac{1}{2}$) 3 fired clay lumps

(NE $\frac{1}{4}$) Oneota vessel frag. (6 rim sherds, 32 shoulder
 and body sherds; Figure 11)
 2 burned bone frags.

(SE $\frac{1}{4}$) Oneota vessel frag. (17 body sherds)
 9 burned bone frags.
 3 animal bone frags.
 1 bone vertebra
 1 lt. scapula (deer)
 1 cracked limestone cobble
 1 exfoliated (heated) granite cobble

(NW $\frac{1}{4}$) 9 animal bone frags.
 1 rt. astragulus (deer)
 2 (box) turtle carpace frags.
 1 unid. bone
 1 gray banded oolithic chert flake frag.

(SW $\frac{1}{4}$) 5 animal bone frags.
 1 distal metatarsus (deer)
 1 lt. calcaneum frag. (deer)
 1 ramus frag. (wapiti)
 1 lt. scaphoid (deer)
 1 atlas (Canis sp.)
 1 axis (Canis sp.)
 (carbon 14 54-57 cm)

60-70 cm (SE $\frac{1}{4}$) 2 animal bone frags.
 1 1st or 2nd phalange frag.
 1 3rd phalange (wapiti Cervis canadensis)
 1 rt. astragulus (deer)
 1 rt. calcaneum (deer)

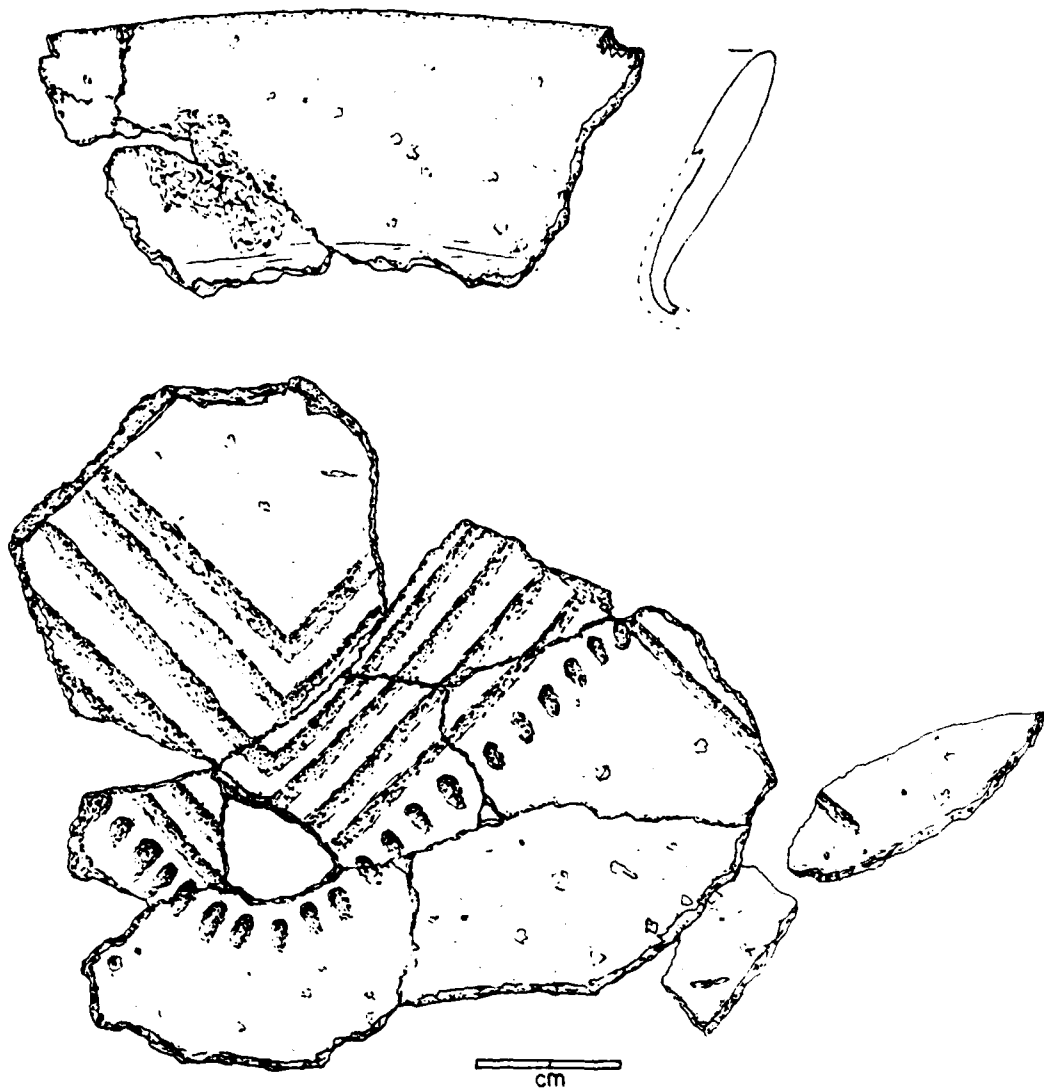


Figure 11. Oneota vessel from TU 9, 13PK407.

test unit 9 (continued)

60-70 cm (SW $\frac{1}{4}$) 5 animal bone frags.
1 siltstone cobble

(NE $\frac{1}{4}$) 1 cracked limestone cobble

test unit 10

70-90 cm charcoal and burned earth
flecks in N $\frac{1}{2}$ of unit

Investigations: Excavations were conducted during 5 days in late May and early June while the Des Moines River level was about 4 to 5 feet below the top of the terrace. The crew returned to 13PK407 in August to investigate the river bank and recheck test unit 1 profiles while the river level was 5 feet lower.

Site 13PK407 investigations consisted of opening 13 test units (no. 1a-f was 5.25 meters², nos. 2-13 were 1-meter squares), 1 shovel test unit, and a pit feature exposed on the river bank (Figure 10). Test unit 1(a-f) was placed on the river bank where a large charcoal feature (#1) was exposed. Test units 2 and 3 likewise were positioned along the bank where charcoal features were visible. A .25 m balk was left between the river and test units 1-3. Test units 4, 5, 6, and 7 were placed at 20-meter intervals in an east-west line across the site, thereby transecting the point bar deposit that 13PK407 is in. Two other lines of test units, including numbers 4, 5, 8, 9, 10, 11, and 13, were positioned in a similar manner to transect the site and its terrace deposits in the north-south attitude. Test unit 12 was placed on the next terrace east of the site to investigate that terrace's soil profile. The remaining procedure consisted of excavating a large (.7 m) shovel test hole (#1) in the southeast quadrant within the woods. All excavations were by shovel-skimming, except for troweling dense cultural deposits. The wet soil from test units was not screened. Test units were excavated to the following depths: TU 7a-e, 110 cm; TU 1f, 170 cm; TU 2, 120 cm; TU 3, 125 cm; TU 4, 137 cm; TU 5, 112 cm; TU 6, 90 cm; TU 7, 90 cm; TU 8, 120 cm; TU 9, 102 cm; TU 10, 100 cm; TU 11, 70 cm; TU 12, 50 cm; TU 13, 30 cm; shovel test 1, 70 cm.

Cultural features and concentrations of charcoal were found in 5 test units. In test unit 3 a 5-centimeter layer of charcoal pieces and burned flecks was found in the east one-half of the unit at 110 to 120 centimeters. There was no evidence to distinguish whether this was a cultural or natural feature. A similar absence of cultural evidence was encountered in 3 other carbon features in test units 4, 9, and 10. In test unit 4 a vaguely basin-shaped depression smeared with charcoal was found at 115 to 120 centimeters. This feature appeared to be a natural burn, perhaps a tree root. In test unit 9 a thin lens of charcoal and burned earth flecks was located in the southeast quadrant at 30-centimeter depth, apparently immediately below the plowzone. In test unit 10, charcoal flecks were present from the plowzone to a depth of 70 centimeters, and a moderately dense

concentration of charcoal and burned earth flecks was present in the north one-half of the unit from 70 to 90 centimeters. No cultural materials were in evidence. These four instances of charcoal features are noteworthy because no cultural evidence was found; however, charcoal and burned earth flecks were common in other test units at the levels that also yielded bones, pottery, and rocks.

The fifth test unit containing charcoal features was unit 1a-f. At a depth of 57 centimeters a large, basin-shaped deposit of carbonized elm (Ulmus sp.) branches were excavated (Figure 13; Plate 2). This feature, numbered 1 in the field, did not contain cultural material, but its configuration and contents are strong evidence for its being a man-made feature. Closeby at the same level was another very thin lens of charcoal, feature 2 (Figure 12). A piece of rusted wire was found on the edge of feature 2. Both features were superimposed by an historic plowzone at 30 to 55 centimeters buried beneath other plowzones. At the bottom of the earliest plowzones (Ap1) were sand skiffs (i.e. thin sand lenses) in the troughs of each plow furrow (Plate 3). Features 3 and 4 were located 85 to 100 centimeters below the surface near the bottom of a buried soil horizon. Feature 3 was a basin-shaped hearth much disturbed by rodent activities, while feature 4 was a lens of carbon overlying and to the south of the hearth (Figure 13). Animal bones, broken cobbles, shell-tempered pottery sherds and micro-flakes also were found within the same levels in the vicinity of the features.

Investigations at the Christenson site also involved inspecting the contents of a pit in the river bank at the north end of the site (Figures 10, 14). The pit, approximately 80 centimeters in diameter and 55 centimeters deep, extended below the buried A soil horizon that contains the components to the south. The river already had sectioned the pit, exposing dark, loamy soil filled with large gastropods, flecks of carbon and burned earth, and numerous small rodent and bird bones. The bones appeared to be the remains of a non-human creature's diet. A 10-centimeter deep excavation into this feature failed to disclose any other cultural material.

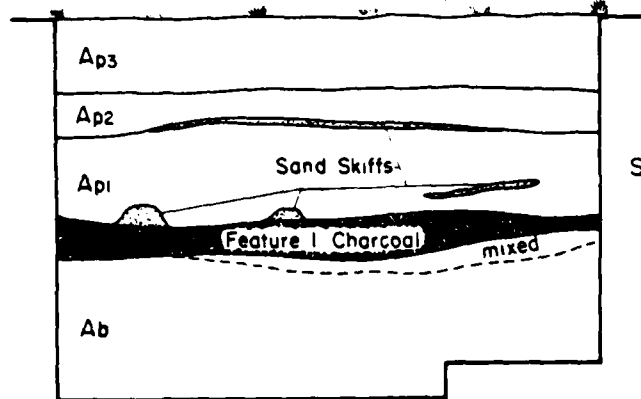
The 1982 investigations added two radiocarbon dates to the date obtained in 1981. In 1981, charcoal from a cultural lens "about one meter beneath the Oneota component" (Benn and Bettis 1981:10) gave a date of A.D. 820 $\pm$ 80 (uncorrected 1130 $\pm$ 80 B.P. (Beta-2633)). That "Oneota component" consisted of a hearth and other bone debris immediately beneath the modern plowzone. The lens, assayed at A.D. 820, occurred at a depth of approximately 130 centimeters below the ground surface in the B2 soil horizon and is assumed to have been a Woodland component. One of the dates obtained in 1982 is 700 $\pm$ 140 B.P.: A.D. 1250 (Beta 5231). This dates wood charcoal from feature 3, a hearth, in close association with shell-tempered body sherds at a depth of 100 to 110 centimeters at the bottom of the A soil horizon (Table 1). Although feature 3 was positioned about 10 meters farther south than the location of the Woodland lens at 130 centimeters (therefore, their relative depths below surface are not comparable because

E ————— W

Unit Ia

Unit Id

47

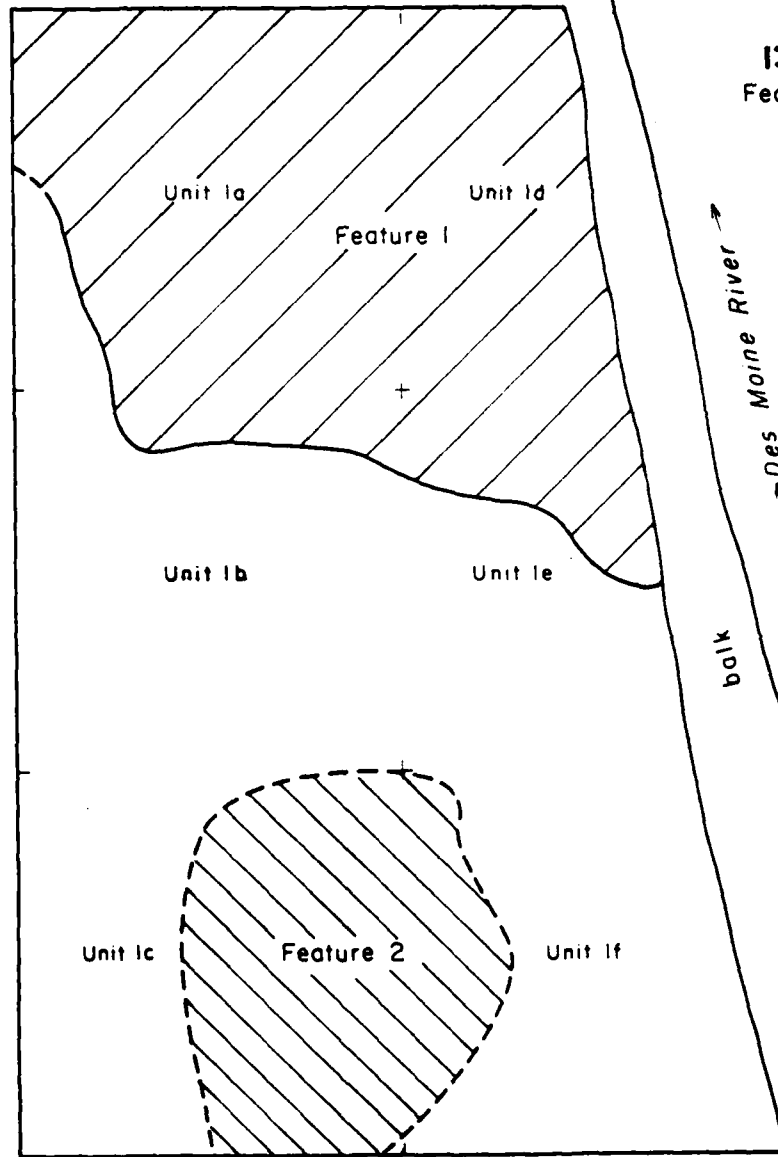


Test Unit I
South Vertical
Profile

Figure 12.

13PK407
Features 1 & 2

20 cm



Test Unit I
Horizontal Profile
57cm depth

N



Plate 2 (left). 13PK407.

The floor of test unit 1 (looking south) as Feature 1 was being cross-sectioned. A sand lens between plowzones is visible on the walls of the excavation.



Plate 3 (right). 13PK407.

The floor of test unit 1 showing sand skiffs at the bottom of plowzone 3 (depth about 45 cm).

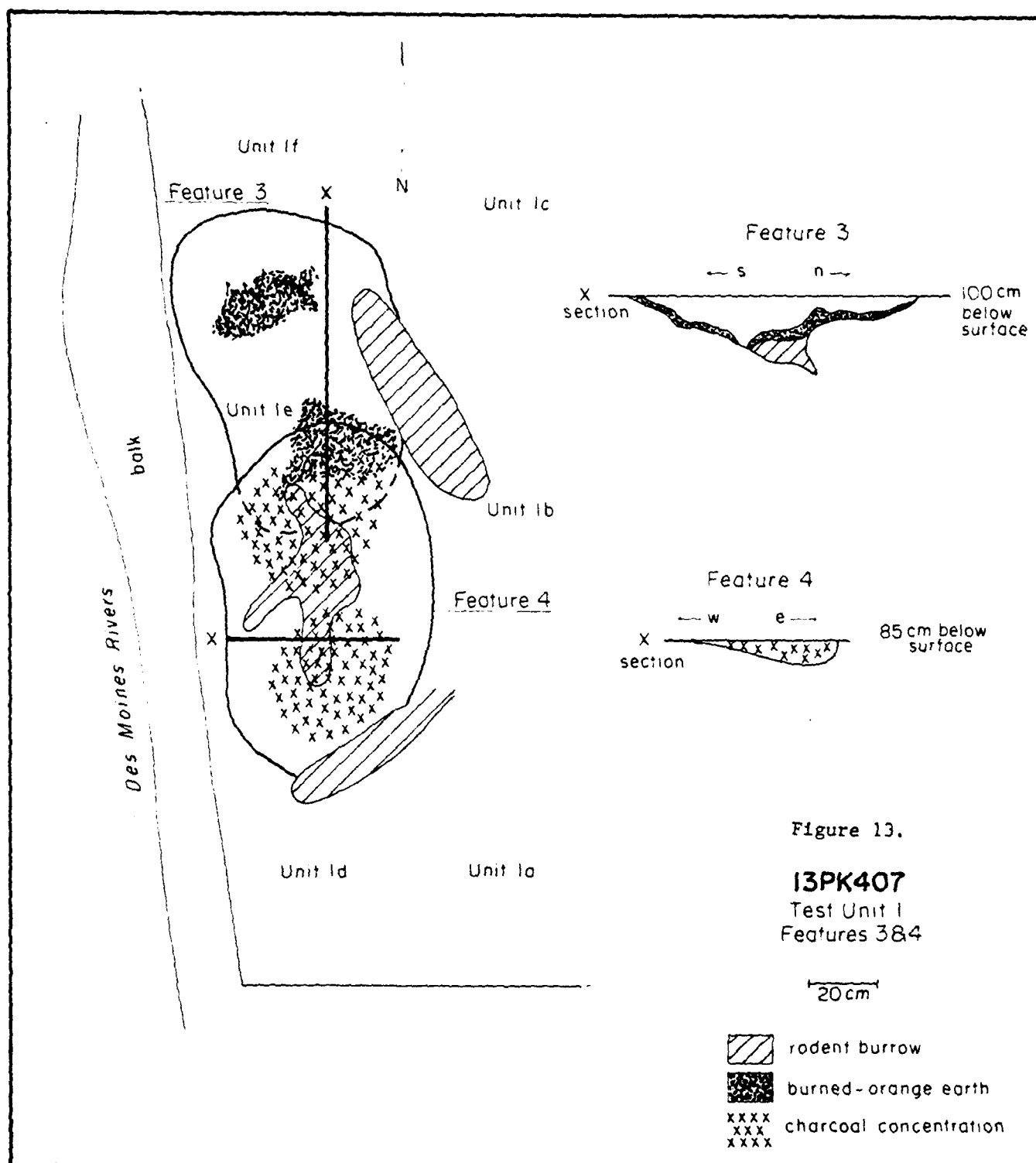


Figure 13.

13PK407
 Test Unit I
 Features 3&4

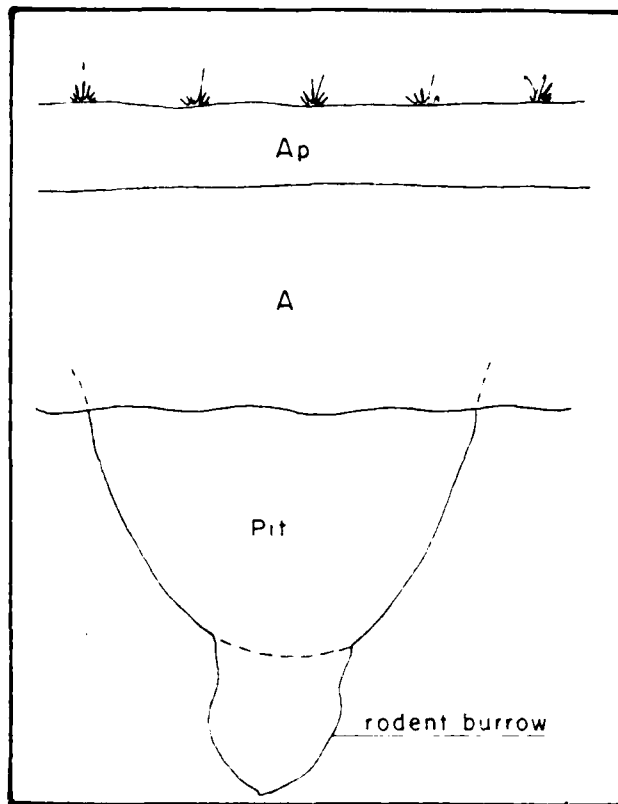


Figure 14.

13PK407 north

Pit in river bank


 20 cm

of the dip of the terrace), the positions of the Oneota and Woodland components in the soil horizons indicate that the radiocarbon dates confirm the stratigraphic context. The other date obtained in 1982 is 235±95 B.P.: A.D. 1715 (Beta-4925). This date is on elm charcoal associated with an Oneota vessel at 54 to 57 centimeters depth in test unit 9, where cultural remains were in situ in the A soil horizon immediately beneath the modern plowzone.

Soil profiles from 13PK407 vary according to their positioning on the terrace. The "bank profile" was described about 25 meters north of TU 2, approximately at the apex of the point bar where part of the A soil horizon was plowed away. The A soil horizon is more completely described in the TU 1 profile. The profile at TU 13 consisted of sand because the unit was excavated into channel fill.

13PK407 bank profile (similar profiles: TU 3, 4, 11)

landscape position: intermediate terrace point bar

parent material: alluvium

slope: 2-5%

vegetation: fallow field

date described: 4/21/81

remarks: profile described from a stream cut (left bank Des Moines River),
C-14 sample collected 100-105 cm, 1,130±80 B.P. (820 A.D.: Beta 2633).

depth (cm)	horizon	description
0- 20	Ap	very dark grayish brown (10YR 3/2), loam, cloddy, friable, noneffervescent, abrupt smooth boundary, few roots
20- 35	+	very dark grayish brown (10YR 3/2), silty clay loam, moderate medium angular blocky, friable, noneffervescent, abrupt wavy boundary, common roots
35- 47	A	very dark gray to very dark grayish brown (10YR 3/1-3/2), silt loam, moderate medium to fine granular, friable, noneffervescent, clear smooth boundary, common roots, common gastropod shells
47- 64	B1	very dark grayish brown (10YR 3/2), silt loam, moderate medium to fine subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, common gastropod shells
64-102	B21	dark grayish brown to brown (10YR 4/2-4/3), silty clay loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, few roots, common gastropod shells, occasional charcoal
102-127	B22	dark grayish brown to brown (10YR 4/2-4/3), silty clay loam, moderate medium to fine subangular blocky, friable, weak effervescence, gradual smooth boundary, common charcoal, this zone is a distinct buried land surface at other locations in this exposure
127-167	B3	brown (10YR 4/3), loam, weak medium to coarse subangular blocky, friable, moderate effervescence, clear smooth boundary
167-base	IIC	brown (10YR 4/3), medium sand, single grain, loose, moderate effervescence, sand and gravel at approx. 300 cm.

test unit 1a south wall (similar profiles: TU 2, 5, 7, 9)

depth (cm)	horizon	description
0- 20	Ap3	very dark grayish brown (10YR 3/2), silt loam,
20- 30	Ap2	massive, friable, noneffervescent, abrupt
30- 53	Ap1	boundaries with sand skiffs, common roots
53- 63	fea. 1	charcoal-filled basin
63- 84	A1b	very dark gray to very dark grayish brown (10YR 1-3/2), silt loam, moderate medium to fine granular, friable, noneffervescent, clear boundary, few roots
84-101	A3b	dark gray to dark grayish brown (10YR 4/1-4/2), silt loam, moderate medium subangular blocky, friable, noneffervescent, gradual boundary, common charcoal
101-131	Bb	dark grayish brown (10YR 4/2), silt loam, weak medium subangular blocky, friable, noneffer- vescent, gradual boundary, few fine brown mot- tles (7.5YR 4/4)
131-170 base of excavation	C	brown to yellowish brown (10YR 5/3-5/4), loamy sand, very weak medium subangular blocky to massive, friable, weak effervescence

test unit 13

0-14 cm, very dark grayish brown (10YR 3/3) loamy sand,
granular, friable, common roots
14-70 cm, yellowish brown (10YR 5/4), sand single grain,
loose, moderate effervescence

test units 6, 8, 10

horizons similar to test unit 1 but plowzone shallower
(30 cm) and B horizons sandier ("chutes" within
terrace)

test unit 12

22 cm plowzone over B horizon (A horizons plowed away)

interpretations: The Christens- site has at least 3 aboriginal components that can be identified from the stratigraphic and radiocarbon evidence. A lens of carbon and animal bones were observed in the B2b soil horizon along the river bank in 1981, and it was subsequently radiocarbon dated at A.D. 840*. No evidence of this component was found in the 1982

*corrected date

test units, although scattered patches of carbon were found in the B horizon in test units 3 and 4. The next higher component is an Oneota manifestation at the A/B horizon interface. This component, dated A.D. 1240*, is evidenced by deer bone fragments and a few pieces of raccoon, bird bone and mussel shell fragments. Broken and fired rocks also are present, which with the bones indicate domestic activities were pursued at the site. This Oneota component is evidenced in test units 1, 2, 4, 5, and 6. The uppermost component is isolated mainly in test unit 9 and also may be present in test units 4, 5, and 8. Domestic trash, including bones identified as wapiti and deer and large sections of an Oneota vessel, comprise most of the evidence for the upper component. This Oneota occupation was deposited in the middle and upper portions of the buried A soil horizon, dating A.D. 1715, and immediately beneath the modern plowzone(s). A piece of rusted wire was found near feature 2, probably was historic fencing material.

The information returned from floating and fine-screening soil samples shows that micro-remains are well preserved, and that these remains can contribute to archaeological interpretation of the Downstream sites. The results of floating features 1 and 3 at 13PK407 illustrate the conclusions (see Table 2). Feature 1 contained carbonized seeds of sorrel, polygonum, and grasses--plants typical of disturbed habitats. Also present was a wild or domestic oat seed (Avena cf. fatua or sativa), an introduced European plant that is associated with historic period cultivation. Feature 1, therefore, is interpreted as a field clearing feature of charred trees. Feature 3 in the Oneota component contained carbonized chenopods and pennyroyal (plants of disturbed habitats) as well as woodland plants, galium and black walnut. The walnut probably reflects aboriginal utilization of this food source, since this species is not a member of the mesic floodplain forest. The uncarbonized (recent) seeds introduced into the feature samples show little overlap with the carbonized taxa. For example, the most abundant uncarbonized seeds are purslane, waterhemp, carpetweed, chenopod, and grasses, all members of open, disturbed habitats typical of agricultural fields. Also present are sedges and rushes which are found along the river.

Components at the Christenson site can be understood only in the context of the terrace in which they are deposited. Before Native Americans visited the location, the terrace was forming as one or more sandy point bars inside a river meander. On top of the sand the river deposited silt and loam in the form of slack-water and overbank sedimentation, and occasionally floodwaters would cross the terrace forming sandy chutes on its surface. A human occupation, perhaps by Woodland peoples about A.D. 840,

*corrected date

Table 2

Botanical Remains Recovered During Testing

	13PK405				13PK407				
	TU 4	TU 1	TU 1	TU 1	TU 1	TU 10			
	50-53 cm	F 1	F 3	F 3	F 4	NE½			
			E½- Ash	W½		70-80			
Carbonized Seeds	1 gal	1 gal	1 gal	2 gal	1 gal	1 gal			
	LF HF	LF HF	LF HF	LF HF	LF HF	LF HF			
GRAMINEAE	-	-	14* 2	-	-	-	-	① uncarbonized	
<u>Avena sativa</u> (white oats)	-	-	1	-	-	-	-	② shaped like <u>Rubus</u> sp.	
<u>Celtis</u> sp. (hackberry)	-	-	-	-	①	-	-		
POLYGONACEAE	-	-	2	-	-	-	-	③ point opposite opening	
<u>Rumex</u> sp. (sheep sorrel)	-	-	1	-	-	-	-		
<u>Chenopodium</u> sp. (goosefoot)	-	-	-	-	1	-	-	* recent in same sample	
CRUCIFERAE (mustard)	-	1	-	-	-	(1)	-	TU = test unit	
LEGUMINOSAE (bean)	-	(2)	-	-	-	-	-	Fea = Feature	
<u>Hibiscus</u> sp. (hibiscus)	-	-	(1)	-	-	-	-	() = similar to	
<u>Oenothera</u> sp. (evening primrose)	-	-	-	-	(1)	-	-	LF = Light Fraction	
<u>Hedeoma</u> sp. (pennyroyal)	-	-	-	-	(2)	-	-	HF = Heavy Fraction	
<u>Veronica</u> sp. (speedwell)	-	-	-	-	-	(1)	-		
<u>Galium</u> sp. (bedstraw)	-	(9) ③	1	-	(1)	-	1	(4)(4) ③	
COMPOSITAE	-	-	-	-	-	1	-		
UNIDENTIFIED	-	2	1	-	-	-	1		
MINUTE UNIDENTIFIED	-	-	-	2	2	-	-		
UNIDENTIFIABLE	-	-	-	1	-	1	1		
TOTAL	0	14	21	5	5	3	2	1 7 0 4 4	

Table 2 (continued)

	13PK405		13PK407						
Recent Seeds	TU 4 50-53 cm		TU 1 F 1	TU 1 F 3 E $\frac{1}{2}$ - Ash	TU 1 F 3 W $\frac{1}{2}$	TU 1 F 4	TU 10 NE $\frac{1}{2}$ 70-80		
	1 gal LF HF	1 gal LF HF	1 gal LF HF	2 gal LF HF	1 gal LF HF	1 gal LF HF			
GRAMINEAE (grass)	-	-	2*	-	-	-	-	-	① 2 polygonum or sedge
<u>Paspalum</u> sp.	-	-	-	-	-	1	-	-	
CYPERACEAE (sedge)	6	-	-	-	1	-	-	-	② not identified due to lack of time
JUNCACEAE (rush)	-	-	-	-	(1)	-	-	-	
<u>Boehmeria</u> sp. (false nettle)	-	-	-	1	-	-	-	-	* carbonized in same sample
POLYGONACEAE (smartweed)	-	1	-	-	-	-	-	-	
<u>Chenopodium</u> sp. (goosefoot)	5	-	-	1	-	6	+	-	
<u>Acnidia altissima</u> (water hemp)	-	-	6	-	-	-	-	-	
<u>Mollugo verticillata</u> (carpet weed)	-	-	1	(1)	-	-	-	-	
<u>Portulaca</u> sp. (purslane)	2	-	37	1	1	-	+	-	
CRUCIFERAE (mustard)	-	-	1	1	-	1	-	-	
<u>Viola</u> sp. (violet)	-	-	-	-	-	-	(1)	-	
COMPOSITAE	-	-	-	-	-	2	-	-	
UNIDENT. SEEP COAT	-	-	1	-	2	-	-	-	
UNIDENT. MINUTE	-	-	-	-	1	-	-	-	
UNIDENTIFIED	-	-	3	3	-	1	-	+	
UNIDENTIFIABLE									
TOTAL	13	1	51	8	4	0	12	0	2+ 0 + 0

Table 2 (continued)

Flotation Samples General Categories	13PK405									
	TU 4		TU 1		TU 1		TU 1		TU 1	
	50-53		F 1		F 3		F 3		F 4	
					E _{1/2}		W _{1/2}			
					Ash					
	1 gal		1 gal		1 gal		2 gal		1 gal	
	LF HF		LF HF		LF HF		LF HF		LF HF	
Carbonized walnut shell (J. nigra)	-	-	-	-	-	+	-	+	-	-
Carbonized nutshell	-	-	-	-	-	-	-	-	-	-
Carbonized wood	+	+	+	-	+	+	+	+	+	+
Carbonized bark	+	-	+	-	-	+	+	+	-	-
Carbonized seeds	28	-	4	5	5	3	2	1	7	0
Carbonized bone	-	-	-	-	-	-	-	-	+	-
Carbonized hair	-	-	-	-	-	-	-	-	+	-
Bone	+	-	-	-	-	-	-	+	-	+
Rodent tooth	-	-	-	-	-	1	-	-	-	-
Snail shell	5	+	8	-	-	1	75	+	39	+
Shell	-	-	-	1	-	-	-	+	-	+
Insect	+	+	-	-	-	-	+	-	-	-
Recent seeds	13	1	51	8	4	1	12	-	+	-
Fungus fruiting bodies	+	-	+	-	+	-	+	-	+	-
Flakes	-	-	-	-	-	0	-	7	-	0
Burned clay	-	-	-	+	-	-	-	+	-	+

may have taken place as the terrace was accreting at elevation 796 feet asl (about 1.3 meters below present elevation of 800 feet). Terrace deposition slowed thereafter, and another occupation by Oneota peoples took place about A.D. 1240. A soil began forming on the surface of the slowly accreting terrace, and near the end of the process of soil formation another Oneota occupation took place about A.D. 1715. At this time the terrace had about 1 meter of relief, as is evidenced by the north-south profile of the buried soil in Figure 10 (profile A-A'), and there were topographic irregularities caused by chutes across the terrace surface. During the historic period the vegetation was cleared (fea. 1) and the terrace was plowed, eroding into the high points at the apex of the point bar. The lower sides and micro-relief of the point bar were filled by overbank sediments, transformed into plowzones (Figures 10, A-A', 12), so that the present-day terrace has approximately .5 meters of relief and little evidence of chutes. The present river channel is eroding the 13PK407 terrace on its west side, so that only the easternmost tip of the original point bar complex remains.

The difficulty of working on the Christenson site stems from its variations in micro-stratigraphy. The buried soil horizon is continuous, and it is easily recognized by conspicuous numbers of large gastropod shells (probably *Triodopsis multilineata* Say 1821) throughout its matrix. But the soil is formed in deposits of silt loam on some parts of the terrace and in sandy chutes on other parts. Apparently, some chutes were created after the soil formed, and the confusion between these pre-soil and post-soil structures is a constant problem for archaeological interpretation. Additionally, the buried soil is not level but dips north-south and east-west (Figure 10, A-A', B'B'). Tracing intermittent cultural components across dipping surfaces and varying sediments is a challenge that will require larger scale excavations than those conducted in the 1982 testing.

The kinds of evidence at 13PK407 make it a significant cultural resource. Most importantly the site contains stratified components with well-preserved features and materials with good contexts and associations. There are plenty of materials for obtaining absolute dates on each component. Components are not mixed, and materials have been affected only slightly by fluvial activities of the river. The kinds of components at the site, Woodland (?) and Oneota, are ones for which there is insufficient archaeological information. It is especially significant that the Christenson site is evidence for the aboriginal utilization of the floodplain, a part of the settlement pattern for which there is little or no information in the Midwest. Site deposits contain evidence (e.g. seeds, gastropods, charcoal, soils) for the natural environment and for human activities (e.g. domestic, hunting, processing) that were pursued here.

recommendations: The Christenson site presently is covered by weeds and forest and is not threatened by surface erosion. A cycle path along the river crosses the site but does not impact it. The primary cultural deposit in the site is being eroded by the Des Moines River. The site is situated on the outside of a turn in the river, and a large eddy has formed against the bank. This eddy is active enough to erode several feet of bank every year. The site is not being eroded at a steady rate, however. At low water (e.g. 1000-3000 cubic feet per second (cfs) outflow at the Saylorville Dam) the river laps against the bank slump well below the cultural deposit and does not erode it. In pre-Dam days the flooding Des Moines River probably flowed over the site, eroding it only for short periods as long as the water stayed up. Nowadays, the river flow may be maintained at or near bank-full (e.g. 9000-12,000 cfs) for days or weeks if the Saylorville Reservoir is too full. Any flow sustained within 1 to 4 feet of bank-full at the site (surface elevation 800 feet asl) erodes the cultural deposit.

In the preceding paragraphs we have explained why the Christenson site is a significant cultural resource. The site meets the criteria for eligibility to the National Register of Historic Places and would contribute information to the RPPP process in Iowa (Henning m.s.). Because bank erosion is sustained and excessive, measures should be taken to mitigate this impact. Two means of mitigation are suggested: 1) The river bank could be riprapped. This action would slow erosion but would not prevent eventual site destruction, for it is inevitable that the natural forces of the river will cause it to meander around the riprap and destroy the site. Thus, riprap would require future maintenance at escalating costs. 2) A one-time salvage by archaeological excavation probably would be cost-effective compared with preservation in place. Salvage excavation would entail explorations of the terrace structure by means of backhoe trenching coupled with block excavations by hand in cultural deposits at the south end of the site. Recommended strategies for salvage excavations are presented in Appendix VI of this report.

13PK409 (Figure 9)

location: Cultural materials are scattered on the ground surface around a slight rise in the northwest corner of a cultivated field. This location is on the west side of a T13 terrace approximately 100 meters east of the present river channel. The elevation at this location is 798 feet. The site covers approximately one acre.

description: In 1981 the site was located while a cultivated field was being surface collected. Chert flakes and a core similar to prehistoric materials were collected, and historic trash (rocks, concrete, ashes, occasional stoneware sherds) was noticed over a wide area in and around the chert scatter. In 1982 the site was in mature corn. Plowing had obliterated concentrations of historic trash turned up in the previous year. The purpose of investigations was to determine if significant cultural resources would be disturbed by construction of a proposed bicycle path across this location (Figure 21).

collection: Material recovered from the surface.

refined earthenware (whiteware)

- 1 hand painted band body sherd (saucer?)
- 2 undecorated body sherds

coarse earthenware (stoneware)

- 2 salt-glazed exterior, metallic brown interior, crockery rims
- 1 brown/brown body sherd
- 1 brown/tan glaze or slip body sherd

glass

- 1 clear rectangular frag.
- 1 aqua bottle base, mold blown, "F.A. 8"

metal

- 2 iron frags. (machinery parts?)

miscellaneous

- 1 brick frag. with slag veneer
- 1 animal bone frag.
- 1 small chert cobble with broken edge (ochre color)
- 1 broken red chert frag.

test unit 1; plowzone

- 5 siltstone rock frags.
- 1 mortar frag.
- 1 brick frag.
- 1 schist rock frag.
- 1 refined earthenware (white) rim frag.

investigations: Chert materials recovered in 1981 had some attributes of prehistoric artifacts, but they also resembled quarry gravels that were used historically to cover roads and mix concrete. The 1982 investigations began with an intensive surface collection to see if additional prehistoric remains could be found. This work consisted of surveying every other crop row on the site. The ground surface in the mature corn was 90 percent visible and weathered. In October a single 1-meter test unit was excavated in a concentration of surface trash in the northwest quadrant of the site. No historic debris was found below the plowzone (to depth of 75 cm).

The soil profile from test unit 1 shows a soil with relatively little structural or vertical development.

test unit 1 west profile

landscape position: intermediate terrace point bar

parent material: alluvium

slope: 0-2%

vegetation: cultivated

date described: 10/23/82

depth (cm)	horizon	description
0-28	Ap	very dark grayish brown (10YR 3/2), sandy silt loam, cloddy, friable, noneffervescent, abrupt smooth boundary
28-52	A2	dark brown (10YR 3/3), sandy silt loam, weak fine subangular blocky, friable noneffervescent, gradual smooth boundary, mottling to horizon below
52-70	A3	dark brown (10YR 3/3) with brown (10YR 4/3) mottling, sandy silt loam, fine moderate sub-angular blocky, friable, noneffervescent, abrupt smooth boundary
+70 base of excavation	C	brown (10YR 4/3), sandy loam, weak medium sub-angular blocky, friable, noneffervescent

interpretations: The 1982 surface and testing collections contain no prehistoric material. Two chert items are part of the other rock debris (i.e. limestone and siltstone cobbles, concrete, slag, granite, cobbles) introduced with the historic component, and chert recovered in 1981 probably has the same origin. In any case none of the 13PK409 chert items resemble other aboriginal chert materials in the Downstream Corridor. Diagnostic historic materials are sparse. The 1982 collection contains only three items (two crockery rims from the same vessel and an aqua bottle base) that date to the mid- to late nineteenth century. No other materials can be dated. In general, the paucity of domestic trash and frequency of rock debris indicates that 13PK409 is a trash deposit. According to the test unit results, material is strictly in the plowzone.

recommendations: The 1982 surface collection failed to yield significant amounts of historic domestic trash or prehistoric materials, and subsurface testing showed material to be relegated to the plowzone. The 13PK409 location is on the highest portion of its terrace, i.e. at the crest of the point bar where potential buried deposits and surfaces would be nearest the ground surface. There is little likelihood that there are intact cultural deposits beneath the plowzone. No additional investigation is recommended for 13PK409. The site does not meet the criteria for eligibility to the National Register.

13PK410 Schmidt site (Figures 15, 16)

location: Cultural materials are deposited in the A soil horizon on the (intermediate) terrace on the north bank of Rock Creek approximately 120 meters east of the former Des Moines River bed. The site elevation is 810 to 815 feet. This location is about one-quarter mile south of the Saylorville Dam on the left side of the Des Moines River valley. Portions of the site on COE property are sod-covered, while those privately owned portions (i.e. north of the boundary fence) are cultivated. In 1982 the site on private property was in alfalfa and unavailable for the survey. Estimated site size is four acres (five acres prior to bridge construction).

description: The site was discovered in 1981 by monitoring construction excavations around a newly constructed bridge over Rock Creek. Stone artifacts and broken cobble concentrations were noted in the adjacent cultivated field (not available for survey because of crops). Cultural materials found in bulldozer cuts on COE property appeared to be eroding from the A soil horizon. In 1982 the site on COE property was covered by a dense stand of sod and weeds which is protecting it from further erosion. A field road runs across the center of the site paralleling the fence in an east-west direction. In the course of bridge construction, Rock Creek was channelized by cutting it through the southeast quadrant of the site. Presently, the banks of the Rock Creek channel are riprapped and are not eroding 13PK410.

collection: All 3 test units and 6 of 7 shovel test units yielded cultural materials.

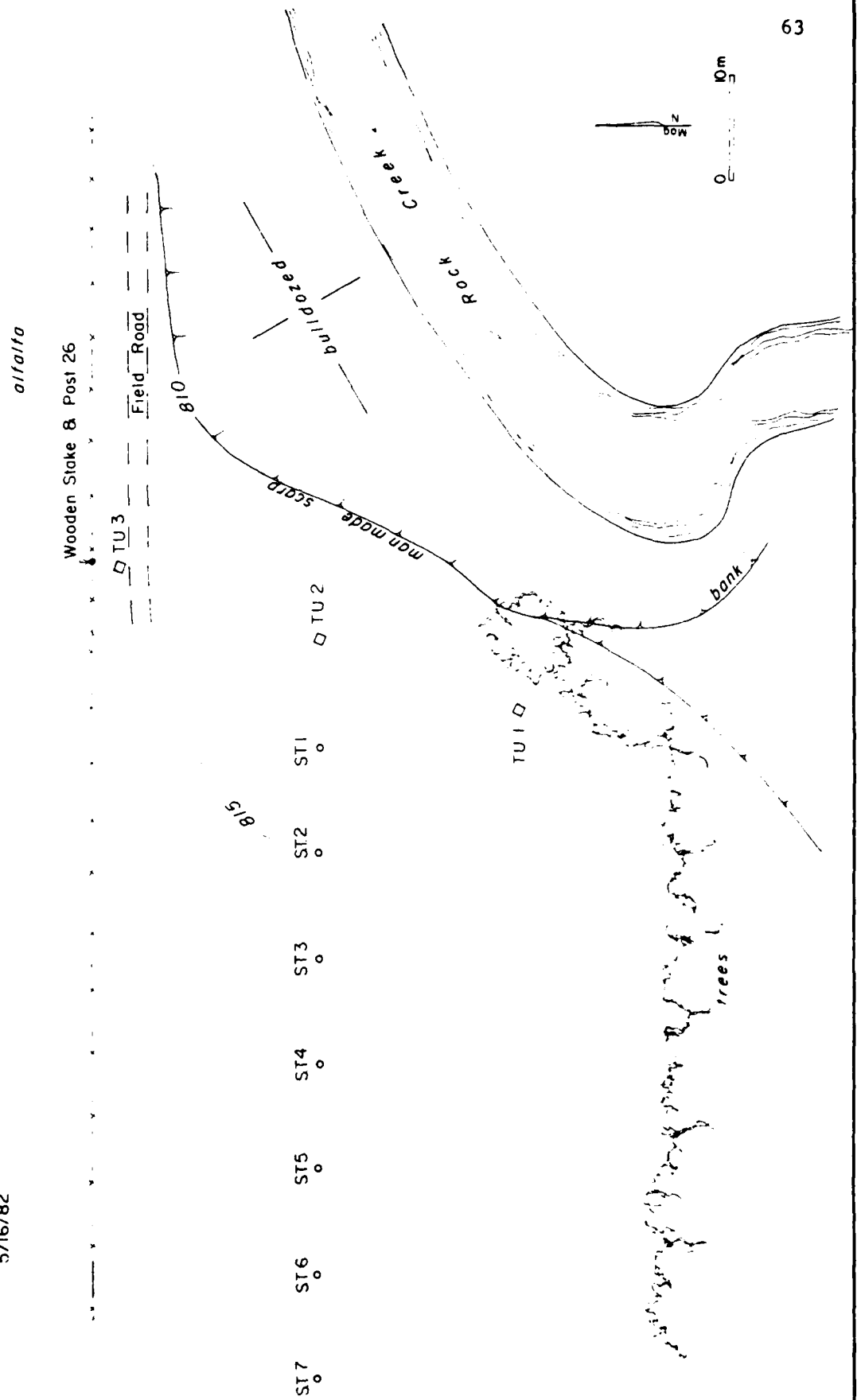
test unit 1

plowzone 1 rusted metal bar frag.
 1 fossiliferous chert flake frag.
 1 fire-cracked granite cobble
 30-40 cm 1 fire-cracked granite cobble
 1 fired clay lump
 40-50 cm 1 white-gray banded chert flake
 1 gray oolitic chert flake
 1 fired clay lump

test unit 2

plowzone 1 large caliber bullet (late military)
 1 piece rusted metal
 fire-cracked rock fragments
 1 orange chert flake frag.
 20-30 cm 3 fire-cracked rock frags.
 1 smooth pebble w/battered end
 30-40 cm bits of burned bone
 1 grit-tempered pottery frag.
 1 sandstone frag. w/abrader groove
 4 fire-cracked rock frags.

Figure 16.
13PK410
 Schmidt Site
 Testing
 5/16/82



test unit 3

plowzone 1 large caliber bullet (late military)

0-24 cm 4 fire-cracked rock frags.

1 battered cobble

30-40 cm 1 animal bone frag.

40-50 cm 1 fire-cracked rock frag.

50-60 cm 5 fire-cracked rock frags.

60-70 cm 2 fire-cracked rock frags.

70-80 cm 2 fire-cracked rock frags.

shovel test 1

plowzone 1 fire-cracked granite cobble

shovel test 2

below plowzone 1 gray chert waste flake

1 fire-cracked rock frag.

shovel test 3

plowzone 1 fire-cracked rock frag.

shovel test 5

plowzone 1 flat sandstone cobble

shovel test 6

plowzone 1 utilized white chert flake frag.

shovel test 7

below plowzone 1 fire-cracked rock frag.

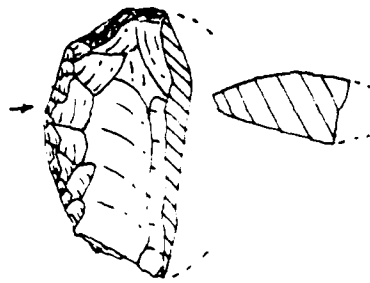
1 end scraper frag. (Figure 17)

investigations: A surface collection could not be made because of dense vegetation covering the entire site. A line of 3, 1-meter test units set at 20-meter intervals was placed across the terrace on a north-south line. The test units were excavated by shovel-skimming and troweling. Backdirt could not be screened because it was too damp. Excavations were carried well into the B soil horizon to depths of: 60 cm in TU 1; 110 cm in TU 2; 80 cm in TU 3. An east-west line of shovel test holes was placed west of TU 2. The shovel test holes about .4-meter square were positioned at 10-meter intervals beginning at TU 2, and the line of tests extended to the low ridge in the center of the terrace where the site is located. Shovel tests were excavated to approximately 50-centimeter depth.

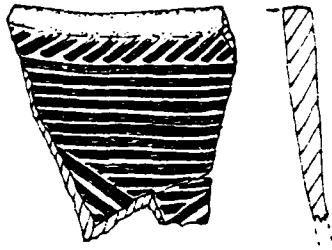
No cultural features or dense concentrations of materials were found. Indeed, artifact finds must be characterized as infrequent. Charcoal and burned earth flecks were observed throughout the cultural layer in the A soil horizon, but these types of remains also were sparse.

The soil profile recorded for TU is essentially the same as the one for TU 1 and is comparable to the description of the profile at the west end of this terrace. The profile for TU 3 differs from that

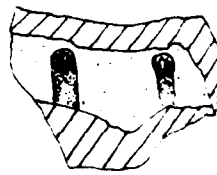
Figure 17. Artifacts from
Downstream
Corridor sites.



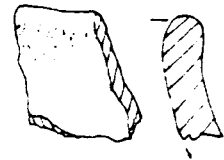
a) end scraper
13PK410/s.t.7



b) Great Oasis rim
13PK413/T.U.6-6(f.1)



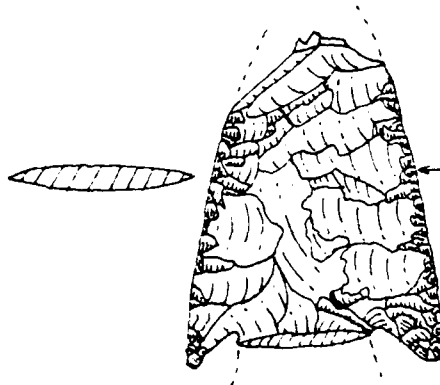
c) Woodland sherd
13PK413/T.U.11-4



d) plain rim
13PK413/
T.U.6-6(f.1)



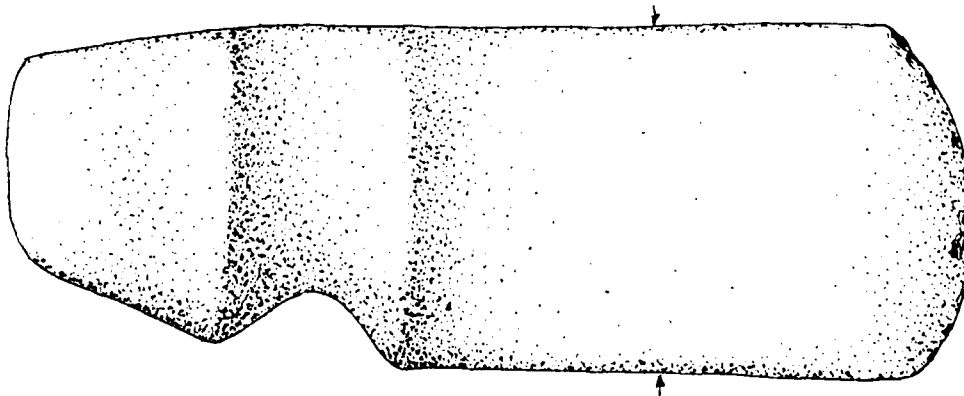
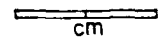
e) projectile
point
13PK413/
T.U.4-5



f) projectile point
13PK414/bank



g) biface
13PK414/bank



h) grooved ax 13PK414/bank 162cm

for TU 1 only in the presence of 37 centimeters of loamy overburden in place of the A1 horizon.

test unit 2 (south face)

depth (cm)	horizon	description
0-22	Ap	dark brown (7.5YR 3/2), loam, massive friable, noneffervescent, abrupt smooth boundary, abundant roots
22-35	A1	very dark brown (10YR 3/1) loam, weak fine granular, friable, noneffervescent, clear wavy boundary, abundant roots, occasional pebbles
35-60	A3	dark brown (7.5YR 3/2) loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots and krotovina, few thin discontinuous very dark gray (10YR 3/1) ped coatings
60-75	B21	dark brown (7.5YR 3/2) loam, strong medium to coarse subangular blocky friable, noneffervescent gradual wavy boundary, common roots, few krotovina, few thin discontinuous very dark gray (10YR 3/1) ped coatings
75-+110 base of excavation	B22	dark gray brown (10YR 3/2) clayey loam, strong coarse subangular blocky, friable, noneffervescent, few roots, common thin brown (7.5YR 3/2) ped coatings

West terrace profile

landscape position: mouth of Rock Creek left bank intermediate terrace

parent material: alluvium

slope: 2-5%

vegetation: clover and rye in close proximity to floodplain forest

date described: 5/15/81

remarks: described from stream cut

depth (cm)	horizon	description
0- 10	All	very dark grayish brown (10YR 3/2), loam, weak fine granular, friable, noneffervescent, clear smooth boundary, abundant roots

depth (cm)	horizon	description
10- 25	A12	very dark grayish brown (10YR 3/2), loam, moderate fine granular, friable, noneffervescent, clear wavy boundary, abundant roots
25- 41	A31	very dark grayish brown (10YR 3/2), loam, weak medium subangular blocky breaking to moderate fine granular, friable, noneffervescent, clear smooth boundary, common roots, common krotovina
41-56	A32	very dark grayish brown to dark grayish brown (10YR 3/2-4/2), loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, common krotovina, few thin discontinuous very dark grayish brown (10YR 3/2) coatings in root channels
56-79	B21	very dark grayish brown to dark grayish brown (10YR 3/2-4/2), loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, few krotovina, few thin discontinuous very dark grayish brown (10YR 3/2) coatings in root channels
79-122	B22	dark grayish brown (10YR 4/2), loam, weak coarse prismatic breaking to moderate medium to coarse subangular blocky, friable, noneffervescent, clear smooth boundary, few roots, common thin discontinuous grayish brown (10YR 5/2) silans, common thin discontinuous very dark grayish brown (10YR 3/2) coatings in root channels
122-160	B31	dark brown (10YR 3/3), heavy loam, moderate coarse prismatic breaking to moderate medium subangular blocky, friable to firm, noneffervescent, clear smooth boundary, few roots, few thin discontinuous very dark grayish brown (10YR 3/2) coatings on ped surfaces and many almost continuous in root channels
160-188	B32	dark brown to brown (10YR 3/3-4/3), sandy loam, moderate medium subangular blocky, friable, noneffervescent, abrupt smooth boundary
188-216	C1	dark brown to brown (10YR 3/3-4/3), sandy loam, moderate medium subangular blocky, friable, noneffervescent, abrupt smooth boundary

depth (cm)	horizon	description
216-base	C2	dark brown (10YR 3/3), loam, weak fine subangular blocky, friable, strong effervescence, few thin discontinuous very dark grayish brown (10YR 3/2) coatings on ped surfaces

test unit 3 (north face)

depth (cm)	horizon	description
0-22	Ap	dark brown (7.5YR 3/2) coarse loam, weak fine granular, friable, noneffervescent, smooth abrupt boundary, common roots
22-37	+	dark brown (7.5YR 3/2) coarse loam, weak fine subangular blocky, friable, noneffervescent, smooth abrupt boundary, common roots
37-47	A3	(same as TU 2)
47-80	B hori- zons	(same as TU 2)

interpretations: Cultural materials are deposited in a well-developed soil horizon on a stream terrace that probably is equivalent in age to the earliest T1 terraces or the TH terrace in the Des Moines valley. Excavations revealed cultural debris deposited in the A soil horizon beneath a thick plowzone in the center of the site (TU 1, 2), but the cultural horizon probably is higher in the profile, i.e. in the plowzone, toward the west (ST 1-7). Near the cultivated field (TU 3) cultural materials were found in the A and B soil horizons buried by a 37-centimeter layer of coarser sediments. We would speculate that materials in the A and B horizons represent at least 2 cultural components.

No new diagnostic materials were recovered in 1982 to add to suspected Woodland and (early) Archaic materials found in 1981. Cultural remains were sparse in all test units, and no obvious concentrations were located. Non-calcined bone does not seem to be preserved. In 1981, rock features were visible in the cultivated field on higher portions of the terrace. It is possible that 1982 test excavations were positioned in the periphery of the site, and that dense deposits (with midden and structures) are present in the cultivated field (private property) and might have existed in the area where the straightened Rock Creek flows today. The presence of fire-cracked rock, chert debris, carbon, burned earth, ceramics, chipped stone tools, and calcined bone indicates that 13PK410 was a domestic site at least. Historic materials on 13PK410 are few and date to the twentieth century.

recommendations: Uphill on the terrace (i.e. in the cultivated field) the cultural deposit may be largely within the plowzone. On COE land the cultural layer is largely beneath the plowzone--as much as 50 centimeters, according to TU 3 stratigraphy. Parts of the site on COE land appear to be buried deep enough not to be affected by surficial modifications. However, much of the original site context may already have been destroyed by plowing and relocating Rock Creek. Portions of the site that remain are stabilized beneath a thick carpet of sod.

13PK410 contains a variety of cultural materials in original contexts, including calcined bone and carbon. Possibly, features also are present. Given these kinds of materials in original associations, this site would contribute to an understanding of the prehistory of the Des Moines valley if investigations ever were undertaken. It is recommended that on COE property subplowzone deposits not be disturbed and that the sod remain in place to protect the site from erosion. If future disturbance of the site is anticipated, salvage excavations in the form of trenching and/or block excavation should be undertaken in the area of the 1982 testing. Additionally, the cultivated field should be intensively collected in a control grid. The site meets the criteria for eligibility to the National Register and would contribute information to the RPPP process in Iowa (Henning m.s.).

13PK411 (Figure 18)

location: Apparent cultural disturbances are sometimes observed in the A soil horizon near the upper surface of a TI4 terrace on the left bank of the Des Moines River, river mile 210.3. The site elevation is about 799 feet asl. Cultural evidence may have extended along 50 meters of the bank. This location is on a TI4 terrace in a location analogous to that of 13PK407.

description and investigations: In 1981 apparent cultural features (i.e. 2 pits) were found in the A soil horizon in the upper portion of a TI4 terrace. A charcoal lens also was noticed approximately 50 centimeters beneath the top of the A horizon. Bits of bird bone were recovered from one pit, but no unequivocal cultural evidence was observed. This site is on the crest of a point bar formation, and the A horizon rises at the center and disappears into the surface plowzone. In 1982 no cultural materials were found during three visits to the site (one visit during and two visits following the high water period). During the first visit a hollow, charcoal-lined hole was observed to extend from the plowzone into the A horizon. This feature was either a burned fence post or tree root mold. The site surface is fallow and in weeds. A 1-meter test unit was excavated about 30 meters east of the river bank on the south side of the terrace at 13PK411. No cultural evidence was found to a depth of 70 centimeters.

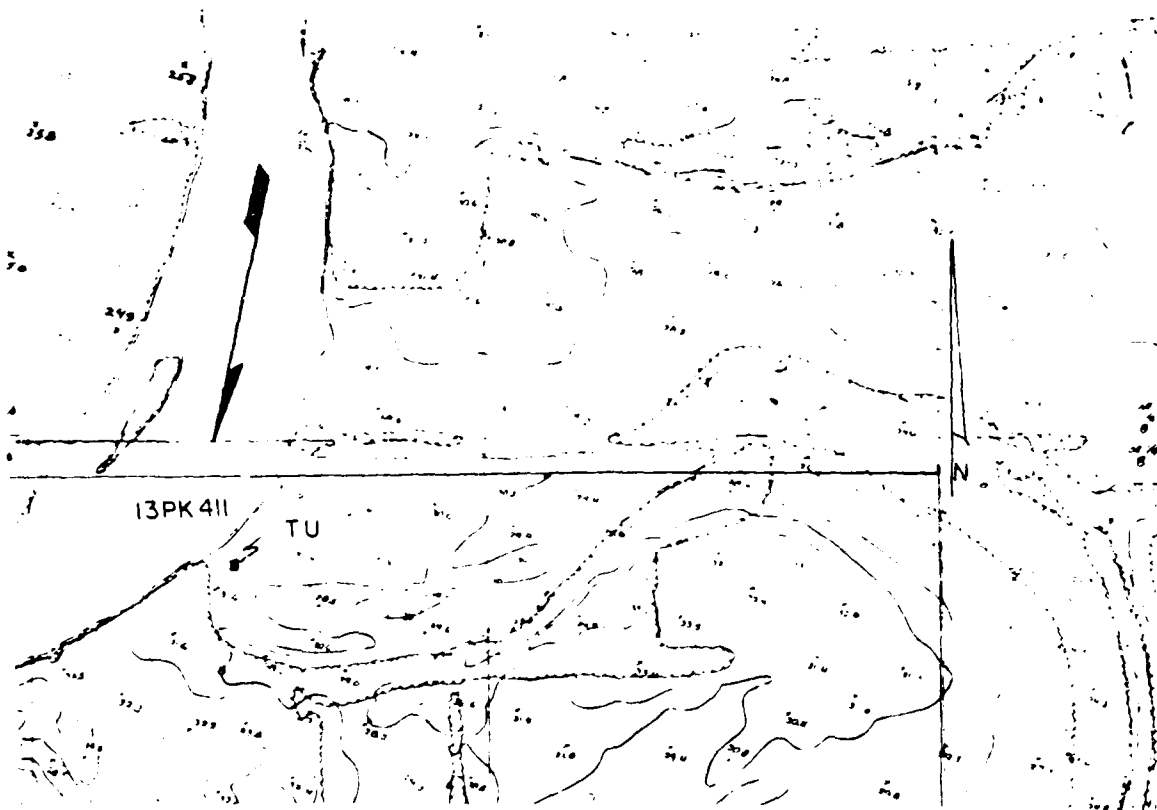


Figure 18. Site 13PK411 in the Downstream Corridor (contour 30'=800' asl; scale 1"=400')

interpretations: No material or features have ever been recovered from 13PK411 to establish that it is a prehistoric cultural site or that it has a substantial historic component. The river bank profile and slumped deposits were adequately exposed during the second and third site visits in 1982, ensuring that, had cultural evidence been present, it would have been visible. Since five site visits and a test unit have yielded no credible cultural evidence, the site is deemed to have insufficient evidence to warrant additional investigation. The types of evidence that were present--bone fragments, charcoal lens, pit-like features--are not associated in a manner characteristic of human deposits. These kinds of evidence apparently are common natural occurrences in river floodplains, particularly in very recent terraces (cf. 13PK424).

The soil at 13PK411 is an Inceptisol with little structural development. It is comparatively young relative to more structurally developed soils on sites like 13PK405 and 13PK407.

13PK411 bank profile

landscape position: intermediate terrace chute

parent material: alluvium

slope: 2-5%

vegetation: fallow field

depth (cm)	horizon	description
0- 10	Ap	very dark gray to very dark gray grayish brown (10YR 3/1-3/2), silty clay loam, cloddy, friable, noneffervescent, abrupt boundary, common roots
19- 42	A12	very dark gray (10YR 3/1), silty clay loam, weak to moderate medium subangular blocky, friable, noneffervescent, gradual boundary, common roots
42- 68	A13	very dark grayish brown (10YR 3/2), heavy silt loam, weak fine subangular blocky, friable, noneffervescent, clear boundary, few roots
68-120	A14	dark brown (10YR 3/3), silt loam, weak medium subangular blocky, friable, weak to moderate effervescence, abrupt boundary, few roots
120-130	IIC1	pale brown (10YR 6/3), coarse sand and fine gravel, single grain, loose, moderate effervescence, abrupt boundary
130-base (200)	IIC2	pale brown (10YR 6/3), medium to coarse sand, single grain, loose, moderate effervescence

Because of these relationships, we feel that the terrace at 13PK411 developed in late prehistoric times, probably after A.D. 820 (13PK407's earliest radiocarbon date) and before A.D. 1530 (the date at 13PK424, a TL terrace). Sites in late prehistoric soil either are rare in the Downstream Corridor or are very difficult to find in the thick deposits of overbank sediments.

recommendations: No interesting or significant cultural remains are known or suspected at this site. No additional archaeological investigation is recommended, and no river bank or site stabilization is recommended. The site does not meet the criteria for eligibility to the National Register.

13PK413 (Figures 19, 20)

location: Cultural remains are deposited throughout the mollic epipedon of a soil developed into a TH terrace on the left side of the river at mile 207.5. The site elevation is 800 feet asl. Presently, the Des Moines River channel is approximately 75 meters south of 13PK413, but a meander scar marking the site's south boundary may have been an active channel at the time of prehistoric occupations. The west boundary of the site is the east bank of Fisher's Lake outlet stream, which meanders south across the Downstream Corridor project area. The site is situated along the west side and in the southwest corner of the High terrace. A portion of the site extends an unknown distance to the northwest on the bank of the stream (private property). Estimated site size is 3 acres.

description: The site was located in 1981 by pedestrian survey and shovel testing, while an abrader was discovered on the surface. The site was wooded and not threatened by any kind of destruction. All but the west edge of this terrace once was cultivated, although the area now contains large oak trees and rapidly growing underbrush. The west fence line bisects 13PK413 in a north-south direction. West of this fence the site is unplowed with a vegetation cover of large trees and a dense stand of saplings (Plate 4).

collection: Eleven of the 13 test units on 13PK413 produced cultural evidence.

test unit 1
20-30 cm 1 socr* body sherd
(grit-tempered)
30-40 cm sherd frags.

*socr = smooth-over-cord-roughened; cr = cord roughened

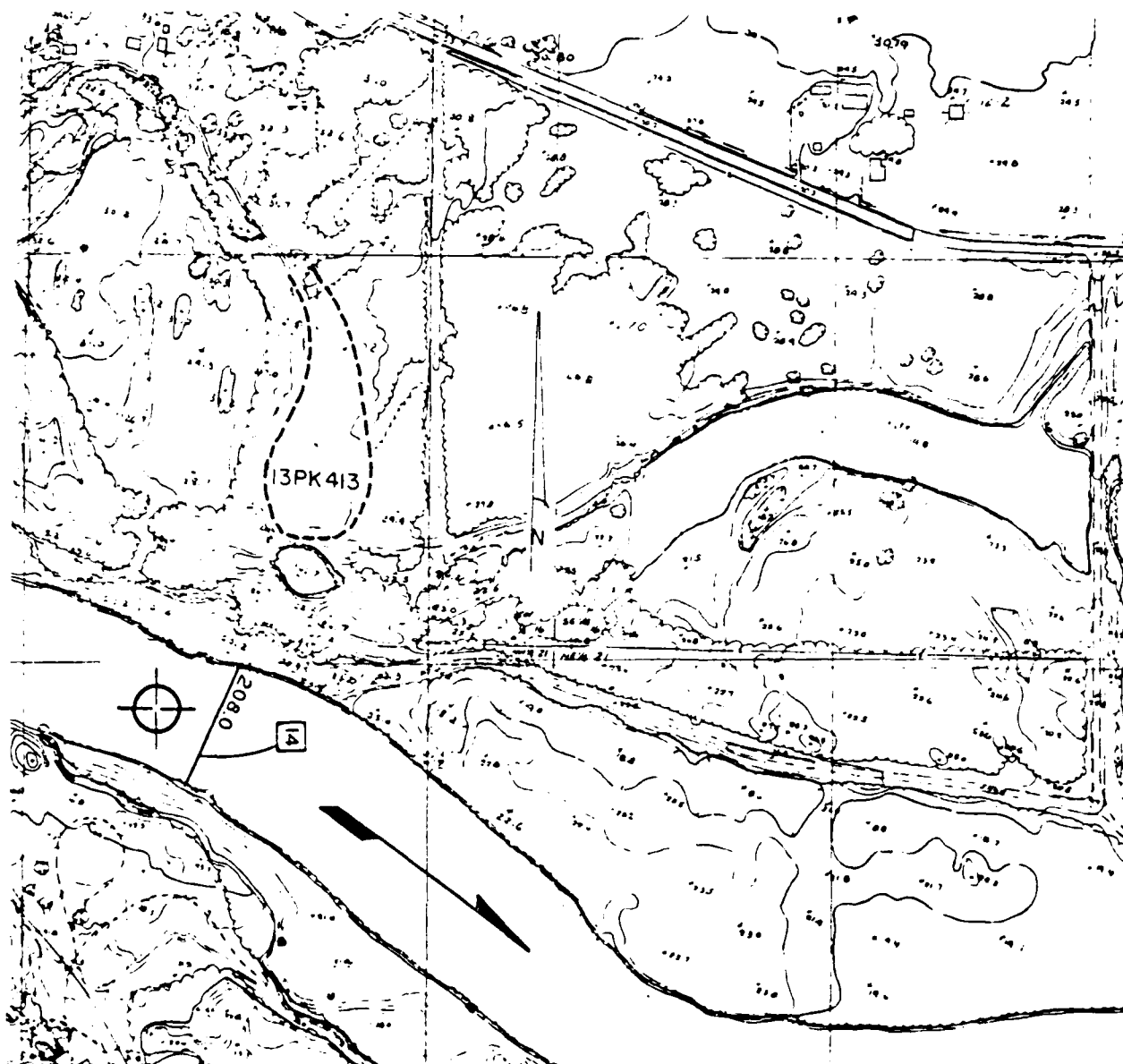


Figure 19. Site 13PK413 in the Downstream Corridor (contour 30'=800' asl; scale 1"=400').

Figure 20.

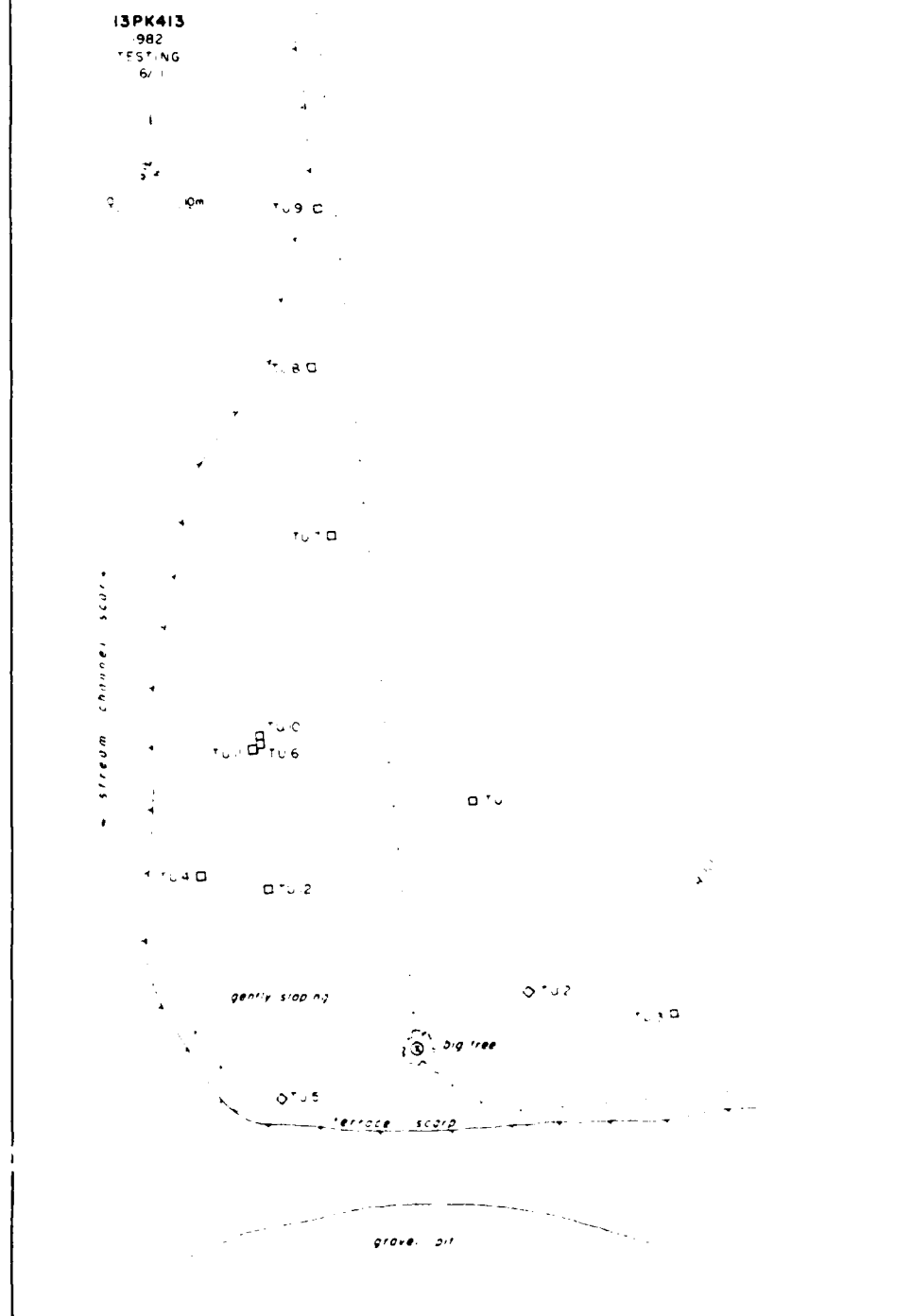




Plate 4. 13PK413. Test units 6, 10, and 11 are shown during their excavation. Note the dense understory of saplings on this portion of the site.

test unit 3

20-30 cm 1 mole humerus (Scalopus aquaticus)
 1 cr* body sherd (grit-temp.)
 3 fired clay lumps
 40-50 cm 1 body sherd (grit-temp.)

test unit 4

30-40 cm 2 fired clay lumps
 charcoal and burned earth flecks
 40-50 cm 1 limestone cobble frag.
 1 sandstone cobble frag.
 1 fired clay lump
 1 corner notched projectile
 point (Figure 17e)

test unit 5

20-30 cm 1 burned bone fragment
 20-40 cm 11 fired clay lumps
 30-40 cm 1 white chert waste flake

test unit 6

10-20 cm charcoal and burned earth flecks
 20-30 cm 1 thin cr body sherd (grit-temp.)
 2 fired clay lumps
 charcoal and burned earth flecks
 30-40 cm 2 fire-cracked rock frags.
 7 fired clay lumps
 charcoal and burned earth flecks
 40-50 cm 1 socr body sherd (grit-temp.)
 3 fired clay lumps
 1 fire-cracked granite cobble
 charcoal and burned earth flecks
 50-60 cm 1 rounded pebble

 fea. 1 1 fire-cracked basalt cobble
 (58 cm) 2 fire-cracked rock frags.
 1 fired clay lump
 1 Great Oasis rim frag. (Figure 17b)
 1 plain rim sherd (grit-temp.; Figure 17d)

test unit 7

60-70 cm 1 fire-cracked rock frag.

test unit 8

0-20 cm 1 barbed wire frag.
 1 green glass frag. (7-Up bottle)
 1 clay pigeon frag.
 40-50 cm 1 body sherd (grit-temp.)
 charcoal and burned earth flecks

* CR = Cord-roughened

test unit 9

40-50 cm 1 body sherd (grit-temp.)
 1 fire-cracked rock frag.
 50-60 cm 1 fire-cracked rock frag.
 60-70 cm 2 fire-cracked rock frags.

test unit 10

20-30 cm 10 fired clay lumps
 1 grit-temp. sherd
 charcoal and burned earth flecks
 30-40 cm 1 burned bone frag.
 1 fire-cracked rock frag.
 1 socr body sherd (grit-temp.)
 3 fired clay lumps
 charcoal and burned earth flecks
 40-50 cm 1 fire-cracked rock fragment
 1 plain rim sherd (miniature)
 1 fire-cracked granite cobble
 50-60 cm 1 body sherd (grit-temp.)
 frags. of carbonized walnut shell

test unit 11

20-30 cm 1 sherd frag.
 charcoal and burned earth flecks
 30-40 cm 2 fire-cracked rock frags.
 7 fired clay lumps
 2 body sherds (grit-temp.)
 1 punctated sherd (grit; Figure 17c)
 1 Great Oasis rim sherd (Figure 17b;
 fits rim in TU 6)
 charcoal and burned flecks
 40-50 cm 1 fired clay lump
 1 untempered sherd (miniature
 vessel base?)
 1 cr body sherd (grit-temp.)
 charcoal and burned earth flecks

test unit 12

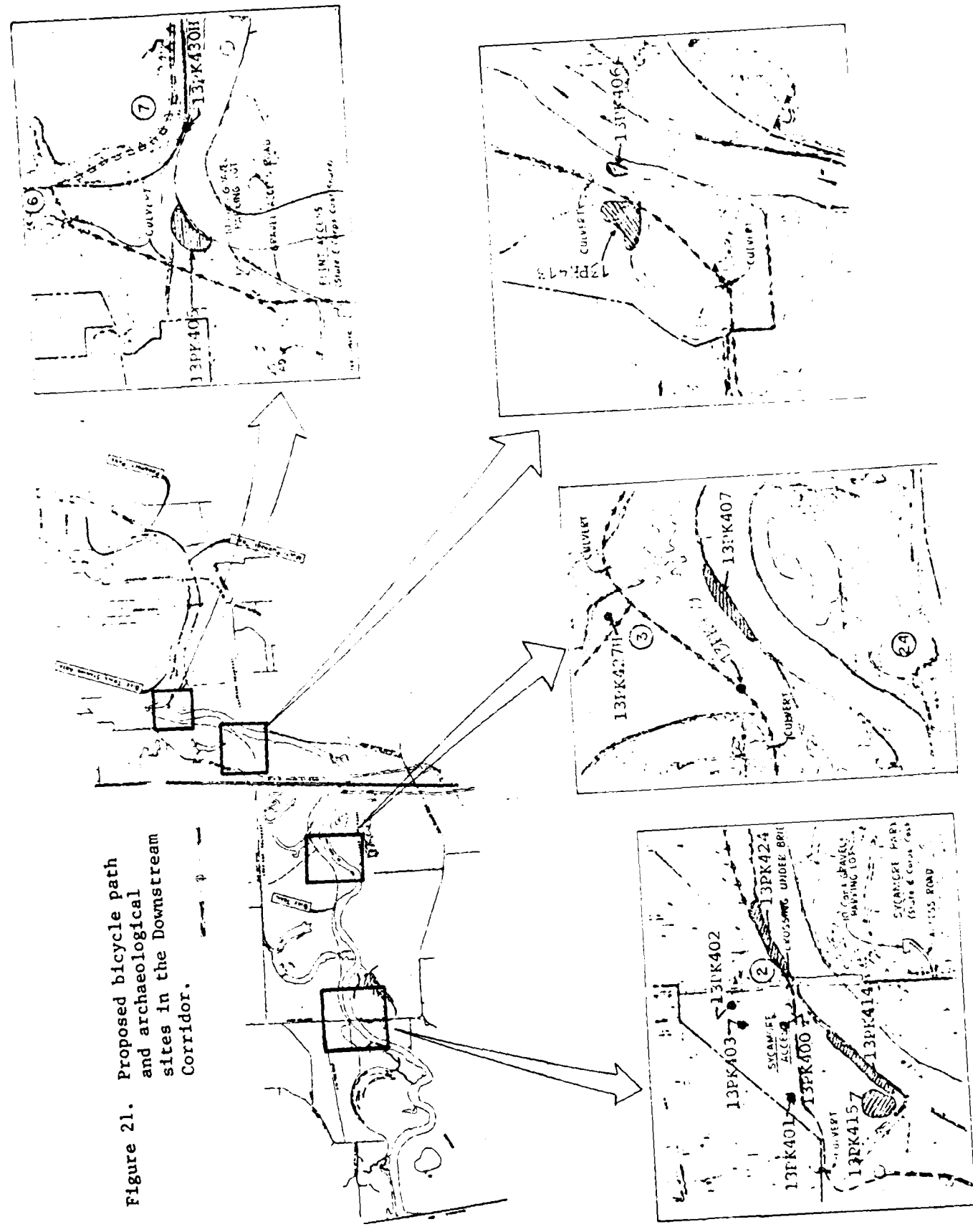
20-30 cm 1 fire-cracked granite cobble
 2 fired clay lumps
 charcoal and burned earth flecks
 30-40 cm 7 fired clay lumps
 3 burned bone frags.
 burned earth flecks
 40-50 cm 7 fired clay lumps
 1 burned bone frag.
 burned earth flecks
 50-60 cm 1 granite cobble
 1 sandstone cobble frag.

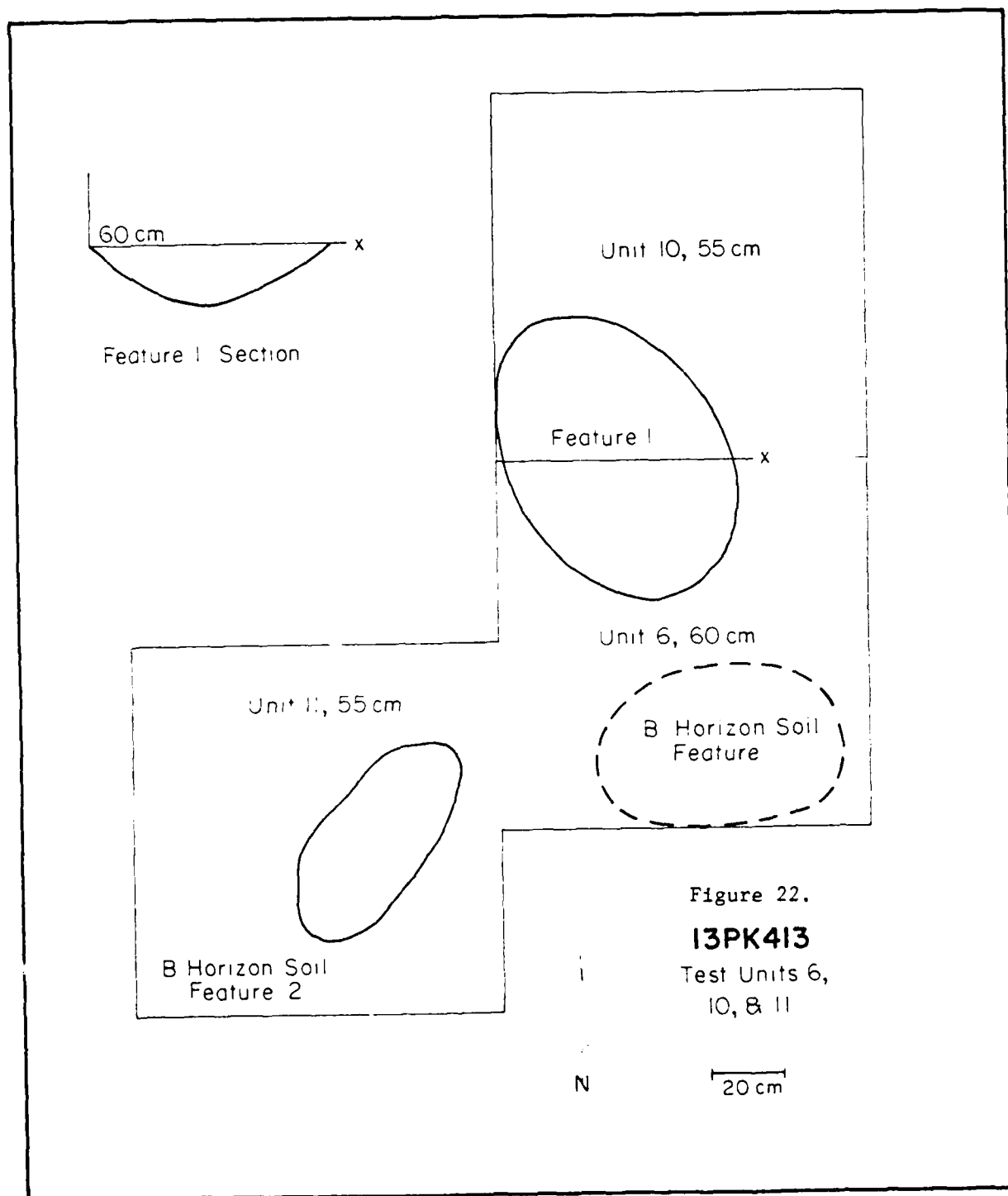
investigations: In 1982, test excavations were undertaken to investigate parts of the site that might be modified by a proposed bicycle path across the southwest corner of the terrace (Figure 21). Testing was concentrated in this corner, and a line of test units was excavated north along the scarp to establish the distribution and density of materials in the site. No excavations were undertaken east across the fallow field because the 1981 shovel testing in this area had been unproductive and because the fallow area is overgrown by a dense stand of multiflora rose. Test units were placed at roughly 20-meter intervals, depending on the positioning of openings in the dense vegetation. Nine 1-meter test units were distributed in the southwest terrace corner and along the west terrace scarp (Figure 20). Three additional test units (nos. 10, 11, 12) were excavated adjacent to, or near, existing units to investigate culturally denser areas of the site.

Excavations were accomplished by hand troweling and shovel-skimming the upper 50 centimeters, the culture-bearing zone. All of this backdirt was screened through $\frac{1}{4}$ -inch mesh. Excavation below the cultural zone was finished by shovel-skimming without screening. Depths of test unit excavations were: TU 1, 60 cm; TU 2, 70 cm; TU 3, 50 cm; TU 4, 110 cm; TU 5, 60 cm; TU 6, 60 cm; TU 7, 95 cm; TU 8, 70 cm; TU 9, 70 cm; TU 10, 60 cm; TU 11, 60 cm; TU 12, 70 cm.

Cultural materials are sparsely scattered on 13PK143, according to data from the test units. Most units produced only one or two items and variable amounts of charcoal and burned earth flecks between 20 centimeters and 50 centimeters in depth. Only occasionally was a broken rock found below 50 centimeters, and no charcoal or burned earth flecks were seen below 50 centimeters. Fifty centimeters is the top of the B soil horizon. Slightly larger amounts of material and burned earth flecks were found in the vicinity of TU 4 and 12 and at the complex of TU 6, 10, and 11 (Figure 20). In the latter area there was a lot of charcoal and burned earth scattered in the 15- to 50-centimeter layers, and pottery sherds were more common. Two rims are from a Great Oasis vessel (Figure 17), and two plain rims and a basal sherd appear to be from a miniature vessel (Figure 17). Another punctated sherd from the lower rim or shoulder (Figure 17) once belonged to a Woodland vessel. Two features also were found in the TU 6, 10, 11 complex (Figure 22). A 60-centimeter diameter, basin-shaped pit (fea. 1) was recognized at the 58-centimeter level on the line between TU 6 and 10. The pit probably extended another 20 centimeters higher in the soil from the point of its discovery. The pit was filled with A horizon soil, bits of carbon, and a few cultural items, including a Great Oasis rim fragment and a plain rim from the miniature vessel. In TU 11 another feature (#2) was identified at the 45-centimeter level. This was a concentration of light colored, "drier" soil--apparently B horizon soil excavated from a nearby pit and dumped by aboriginal inhabitants of the site. A similar anomaly of B horizon soil was noticed at 50-centimeter depth in TU 6.

Figure 21. Proposed bicycle path and archaeological sites in the Downstream Corridor.





Historic material from 13PK413 is sparse and came from one area, TU 8. This unit was positioned near a rude log "shed," which is now crumbling and vandalized. The logs are made from small trees, and the structure's walls are crudely constructed. This structure appears to have been a children's playhouse, and historic materials around it belong to the recent twentieth century.

Soil profiles in test units are representative of the TU 4 profile printed below. Minor variations in the profiles of some test units also are described here.

test unit 4 (west profile)

landscape position: TH terrace

parent material: alluvium

slope: 0-2%

vegetation: forest

date described: 6/11/82

depth (cm)	horizon	description
0- 1	Ao	dense leaf litter and decomposing wood and roots
1- 16	A11	black to very dark gray (10YR 2/1-3/1), loam weak fine-medium granular, no effervescence, smooth diffuse boundary, common roots
16- 27	A12	very dark gray brown (10YR 3/2), silt loam, moderate fine subangular blocky, friable, no effervescence, gradual smooth boundary, common roots
27- 48	A3	very dark gray (10YR 3/1), silt loam, moderate medium subangular blocky, friable, no effervescence, clear wavy boundary, few discontinuous (spotty) coatings on ped surfaces, few roots, common worm casts
48- 68	B11	dark brown (10YR 3/3), silt loam, moderate medium subangular blocky breaking to fine angular blocky, no effervescence, diffuse smooth boundary, half of ped surfaces with thin very dark gray brown (10YR 3/2) clay coatings, few roots
68-95	B12	dark gray brown (10YR 4/2), light silty clay loam, moderate medium-large subangular blocky breaking to fine and medium, no effervescence, clear smooth boundary, half of ped surfaces with thin very dark gray brown (10YR 3/2) clay coatings

depth (cm)	horizon	description
95-+105 base of excavation	B2t	very dark gray brown (10YR 3/2), silty clay loam, moderate medium-large subangular blocky breaking to fine-medium, no effervescence, thick continuous very dark gray (10YR 3/1) clay coatings on ped surfaces

test unit 2-east profile

0-20 cm Ap
same as above except structural boundary at 20 cm; from granular and friable above to moderate fine subangular blocky below

test unit 5-east profile

horizon A11 and most of A12 removed from borrowing along edge of scarp for nearby gravel pit

test unit 7-west profile

same as above except A3 extends to 63 cm; A horizon overthickened because of natural levee deposits at surface

test unit 9-east profile

same as above except A3 extends to approximately 70 cm; A horizon overthickened because of natural levee deposit at surface

interpretations: The terrace at 13PK413 is the High terrace, a mid-Holocene structure that dominates much of the Des Moines River valley in the reach of the Downstream Corridor. A well-developed soil (see TU 4 profile above) is in place in the upper sediments of this terrace. It is a soil with a mollic epipedon and argillic B horizon. Materials buried deeply in this soil are likely to be fairly old in terms of human occupations (cf. radiocarbon date, Beta-2634; 5190±100 B.P. from a TH context at 13PK414; Table 1). In the same manner, cultural materials in the upper portion of the solum (A horizon) are likely to date to the late Holocene. The positioning of the TH terrace at 13PK413 also is noteworthy. Immediately south of this location the valley narrows considerably (Figure 4), and the meandering river has removed nearly all of the High terrace. The position of the TH terrace in the center of the valley very near the active river channel renders it an optimal location for human occupation in the floodplain. That the 13PK413 location has always been near the river channel is assured by the narrowness of the valley.

Two prehistoric components are present with certainty at 13PK413. A Great Oasis component, probably dating after A.D. 900 (Gradwohl

1974:97), is deposited between 15 centimeters and 50 centimeters. Within these levels the occupational surface(s) may occur between 20 to 30 centimeters while pits extend as deep as 50 to 60 centimeters. A Woodland component also occurs on the site, but evidence for the age and association of this component is miniscule--one punctated sherd and a small corner-notched projectile point. The punctate motif is uncommon in single-cord impressed Woodland wares, which date after ca. 800 A.D. (see Gradwohl and Osborn 1981; Osborn, Gradwohl and Thies 1978). Stratigraphically the Woodland component probably is mixed with the Great Oasis component, the former being only slightly beneath the latter. Isolated, broken cobbles did turn up in deeper levels not associated with burned earth and carbon flecks common to the Great Oasis/Woodland levels (e.g. TU 7, 12). We should not ignore the possibility of a third or deeper components on this terrace.

Nowhere is the material density especially great on 13PK413. A locus of prehistoric activity may be present in the vicinity of TU 6, 10 and 11, where features and sherds from at least 3 vessels were found. Another activity locus might be found near TU 4 and 12, where a projectile point and other materials were found and where burned earth/carbon flecks are common. If these are activity areas (e.g. structures, camps, procurement/processing stations), their artifact densities are surprisingly low. Indeed, it is curious that an intact site of 3 or more acres in size should have so little evidence of internal variability and high artifact density.

Excavation profiles reveal that parts of the site within the fence have been plowed, while the wooded area outside (west) the fence shows no evidence of plowing. Understory vegetation on the entire site was removed at some time in the distant historic past (the area inside the fence was mowed until 1981), and only widely spaced, mature oak trees were left to grow. Despite plowing, cultural deposits within the fenced field are largely intact, the upper one-half of the A soil horizon having been incorporated into the plowzone. Regrettably, excavations in the field revealed a somewhat "compacted" A horizon; interstices in the natural soil have been compressed by years of machinery running over the surface. Thus, the soil is dense, sticky, and difficult to excavate by troweling and shovel-skimming. Areas of the site outside (west) of the fence are unplowed, but a dense stand of saplings and poison ivy is growing here (Plate 4). Excavating through roots in this area is laborious, and cultural features are difficult to detect in the dark colored soil. At the extreme southwest corner of the site, around TU 5, (Figure 20) the uppermost A horizons have been removed, apparently because of borrowing around a nearby gravel pit. This is the portion of the site where the proposed bicycle path is to be placed.

recommendations: The only portion of 13PK413 threatened with modification is the southwest corner, where a bicycle path will disturb as much as the upper 50 centimeters in a 3- to 4-meter wide swath. Since this area of the site has already been disturbed by nearby quarrying, the

bicycle path construction is not considered likely to impact a significant part of the site. Construction may proceed as planned without additional investigation of the southwest corner of 13PK413. However, it is understood that the bicycle path will not impose on the site more than approximately 20 to 25 meters north of the scarp edge, nor will portions of the site outside the work easement be disturbed in any fashion. Construction disturbances in the vicinity of TU 4 and 12 would destroy significant cultural resources.

No additional assessment or mitigative archaeological work is recommended for 13PK413. The cultural deposit should remain undisturbed beneath a dense vegetation cover. If the site area is scheduled for construction, development or other modifications in the future, salvage excavations should be undertaken to recover significant cultural information. Those investigations should consist of extensive hand trenching and/or "checker board" excavations to locate and define activity areas, followed by block excavations to expose large areas of cultural surfaces.

Site 13PK413 meets the criteria for eligibility to the National Register of Historic Places and would contribute information to the RPPP process in Iowa (Henning m.s.). The site contains significant information about the diets, productive strategies, and settlement patterns of the peoples who lived there. The archaeological information is undisturbed by plowing, and the site contains cultural features with artifactual materials in original contexts. The site also is unusual for its relatively sparse scatters of debris, especially in contrast to Great Oasis sites which often have much denser scatters.

13PK414 (Figure 23)

location: Cultural materials and natural burns are distributed in the surface and buried soil horizons in the TH terrace situated on the left river bank immediately north of the Sycamore bridge. The surface elevation at this location is 813 feet asl. The site is exposed along ca. 75 meters of river bank on the cutbank side of a turn in the Des Moines River. It is not known how far the site extends inland away from the bank.

description: In 1981 a lens of burned soil and carbon flecks was found at a depth of 1.6 meters in the river bank approximately 50 meters upstream from the Sycamore bridge boat ramp (see Beta-2634 date, Table 1). A bit of bird bone was found nearby, and a calcite crystal was found at the extreme north end of this terrace in uncertain context. In short, no unequivocal evidence of human occupation was found. In 1982, three visits to the river bank resulted in the discovery of several bits and pieces of evidence that confirm the presence of human remains. Another burned feature was found at a depth of 2.1 meters near the burn of the previous year. A three-quarter grooved ax was found at 1.62-meter depth approximately 10 meters north of the burned features, and isolated

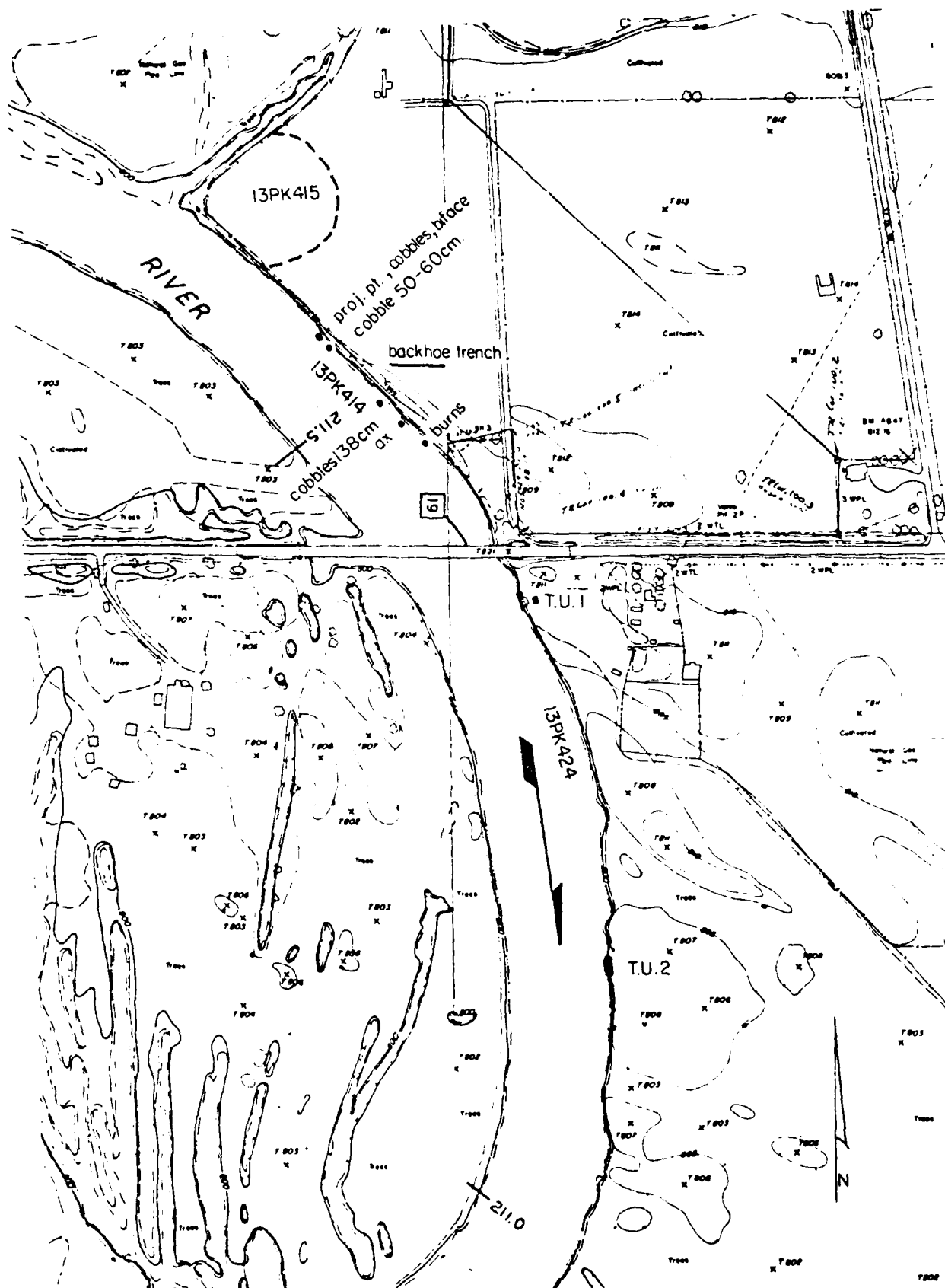


Figure 23. Sites in the Downstream Corridor (contour 30'=800 asl; scale 1"-400').

fire-cracked cobbles were found on the bank and in the slump 50 to 70 meters north of the burns (Figure 23). About 100 meters north from the burns a notched projectile point, a biface, fire-cracked rocks, and fragments of animal bone were located in the bank slump.

There is a parking lot and boat ramp at the south end of 13PK414, and the entire river bank at the site is heavily utilized by fishermen. The Des Moines River is slowly eroding the bank at the location of the burn features, but extensive and deep erosion will be prevented in the future by riprapping at the Sycamore bridge and parking lot.

collection: All items are surface finds from the river bank.

- fire-cracked granite cobble, 138 cm depth in bank (B2 horizon)
- fire-cracked granite cobble, 50-60 cm depth in bank (A3 horizon)
- three-quarter grooved ax and pocket gopher (Geomys bursarius) incisor, 162 cm depth in bank (B2 horizon) (Figure 17h)
- 2 igneous fire-cracked cobbles, a black chert biface (Figure 17g), and a barbed projectile point (Figure 17f) from bank slump
- 3 fire-cracked igneous rock fragments, 1 flake, 1 mussel shell fragment, and 4 small animal bone fragments from B horizon soil slumped on bank

investigations: The project proposal called for careful inspection of the river bank to find cultural evidence and exploration of deep deposits by machine-assisted excavation. High water and water-logged sediments prevented our undertaking machine excavation until the month of October. The bank at 13PK414 stands 1 to 4 meters in vertical height above the bank slump. The entire exposure of this bank and its slumped sediments were carefully inspected to search for charcoal and burned earth flecks as well as artifacts and features. This search was futile, except for finding an isolated burn lens in August and an ax in October. The burn lens in the buried A horizon at a depth of 2.1 meter was an irregular, basin-shaped feature approximately 2 to 15 centimeters thick and 1 meter wide. It consisted of burned-orange and black soil and carbon smears that were irregularly contoured and distorted. From all appearances the feature was a tree stump burn. No cultural evidence was found during scraping in and around this feature. The ax and a nearby pocket gopher incisor were found at a 162-centimeter depth about 10 meters north of the burned features. This depth is in the B2 soil horizon about 6 centimeters above the surface of the buried A horizon (see following soil profile description) at this location on the TH terrace. This is the same depth and context as the 1981 burned feature that produced a radiocarbon date of 5990 $\pm$ 100 B.P.* (Table 1). Scattered pieces of carbon were found

*corrected date

below the ax, but no other cultural material was evident. Most of the other cobbles, bones, the projectile point, and the biface were discovered in and near a lens of bank slump at the north end of 13PK414 (see Figure 23). The slump was B horizon sediments, but no intact cultural deposits could be located in the vertical bank.

In October a 50-meter long backhoe trench was excavated across (east-west) the High terrace at 13PK414 (Figures 23, 27). The trench was designed to transect the terrace sediments at right angles to the normally visible river bank profile. The south trench wall was profiled, and soils were described by E.A. Bettis. That information is discussed in the next chapter of this report. The only cultural evidence from this trench consisted of a small fragment of fire-cracked granite rock.

A 4-meter vertical section of the bank profile was exposed during a late period of the fieldwork. The exposure (5 meters north of the burned features) offered an opportunity to extend downward the description started in 1981. (Other soil profiles are described in Figure 27).

13PK414 bank profile

landscape position: high terrace natural levee

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 4/27/81 and 8/3/82

remarks: C-14 sample collected 160-170 cm, 5,190±100 B.P. (3,240 B.C. Beta-2634), profile described in stream cut (left bank Des Moines River)

depth (cm)	horizon	description
0- 25	A11	black (10YR 2/1), silt loam, moderate medium granular, friable, noneffervescent, clear boundary, abundant roots
25- 93	A12	very dark gray to very dark grayish brown (10YR 3/1-3/2), silty clay loam, moderate medium granular, friable, noneffervescent, gradual boundary, common roots
43- 82	A3	very dark gray (10YR 3/1), heavy silt loam, moderate medium subangular blocky, friable, noneffervescent, gradual boundary, common roots

depth (cm)	horizon	description
82-109	B1	dark brown (10YR 3/3), heavy silt loam, moderate medium to coarse subangular blocky, friable, noneffervescent, clear boundary, few roots, few thin discontinuous very dark grayish brown (10YR 3/2) coatings on ped surfaces
109-160	B2	dark brown to brown (10YR 3/3-4/3), silty clay loam, moderate medium to coarse subangular blocky, firm, noneffervescent, gradual boundary, few roots, common thin discontinuous very dark grayish brown (10YR 3/2) coatings on ped surfaces, thick coatings in root channels
160-180	B3	dark brown (10YR 3/3), silt loam, weak medium to coarse subangular blocky, friable, noneffervescent, few roots, very thin discontinuous dark brown (10YR 3/3) coatings on ped surfaces, common charcoal and burned earth 160-170 cm
180-218	Ab	dark brown (10YR 3/3), silt loam, weak medium subangular blocky, friable, noneffervescent, gradual boundary, few roots, very few thin discontinuous dark brown (10YR 3/3) coatings on ped surfaces
218-249	Cb	brown (10YR 4/3), sandy silt loam, weak coarse subangular blocky, friable, noneffervescent, few roots, very few thin dark brown (10YR 3/3) coatings on ped surfaces, very fine light and dark mottling
249-299	+	dark yellowish brown (10YR 4/4), sand in layers with dark brown (10YR 3/3) loam, massive, friable, effervescent, few roots
299-326 base	+	very pale brown (10YR 7/4), coarse sand, banded and massive, effervescent

interpretations: There are two soils formed in the TH terrace at 13PK414. The surface solum extends to a depth of 160 to 180 centimeters or more, and a buried A horizon is present beneath 160 to 180 centimeters (Figure 27). Enough cultural materials were found in context to demonstrate the presence of more than one cultural component. The cobble at 50 to 60 centimeters in the upper B horizon of the upper soil could represent a Woodland aged site. The projectile point found in bank slump, with other rock and bone fragments and a biface, is similar to the type, Marshall barbed, a Middle Woodland period type common in the Illinois River valley (Montet-White 1968). The point and other materials came from B horizon slump, whose context (age) is uncertain. The cobble found at 138 centimeters is in the mid-B horizon which must be Archaic aged. The burn lens found at 160 to 170 centimeters (4040±100 B.C.:Beta-2634) in 1981 was in the

B3 soil horizon just above the buried A horizon. The ax and associated bone fragment were in the same stratigraphic position as the dated burn and therefore must be late Middle Archaic in age. While these remains taken together amount to minimal evidence for two or more cultural components, they indicate that this location on the TH terrace was visited by humans as it was accumulating during the mid- and late Holocene. The visits were of short duration for very limited purposes, and so little trash and few artifacts were left behind as documentation of the visits. The material scatters of each component are small and thin. They are miniscule spots in the huge volumes of alluvium in the TH terrace.

recommendations: Cultural materials are few and far between at 13PK414. Because they are so infrequent, context is difficult to establish even with intensive bank inspections and trenching with machines. (Recall that the 50-meter backhoe trench produced almost no human evidence; the only spectacular artifacts--the projectile point and ax--were inadvertent discoveries made while the site was being visited for other purposes.) Lacking easily defined and reproducible contexts for cultural materials, 13PK414 is judged not to meet the criteria for eligibility to the National Register of Historic Places. The site is eroding very slowly and will continue to yield an occasional artifact. However, its destruction will be prevented by the resistance of the riprapped parking lot and Sycamore bridge immediately downstream. No additional archaeological investigation is recommended for the immediate future. If plans are formulated to mechanically modify any part of the site, archaeological testing within the right-of-way is recommended to determine if significant cultural deposits will be impacted.

13PK415 (Figures 23, 24)

location: Cultural material is near the surface of the TH terrace on the left bank of the Des Moines River north of the Sycamore bridge. The site elevation is 813 feet asl. This location is in the northwest corner of a cultivated field (fallow since 1981), covering an area of approximately 2 acres. The site is bordered on the west by the river bank and on the north by a man-made drainage channel, which probably follows the course of an ancient river meander scar.

description: In 1981 a small number of prehistoric items were discovered on the plowed and weathered surface of 13PK415. These items included chert cores, cobbles, and a pottery sherd, but these finds were not concentrated in any area of the site. In 1982 the site was overgrown with tall grass, and the river bank profile was obscured by tree growth. The site is not being disturbed by any form of human activity.

collection: Four test units excavated in the site produced cultural remains. Clay pigeon fragments were common in the plowzones of all 4 units.

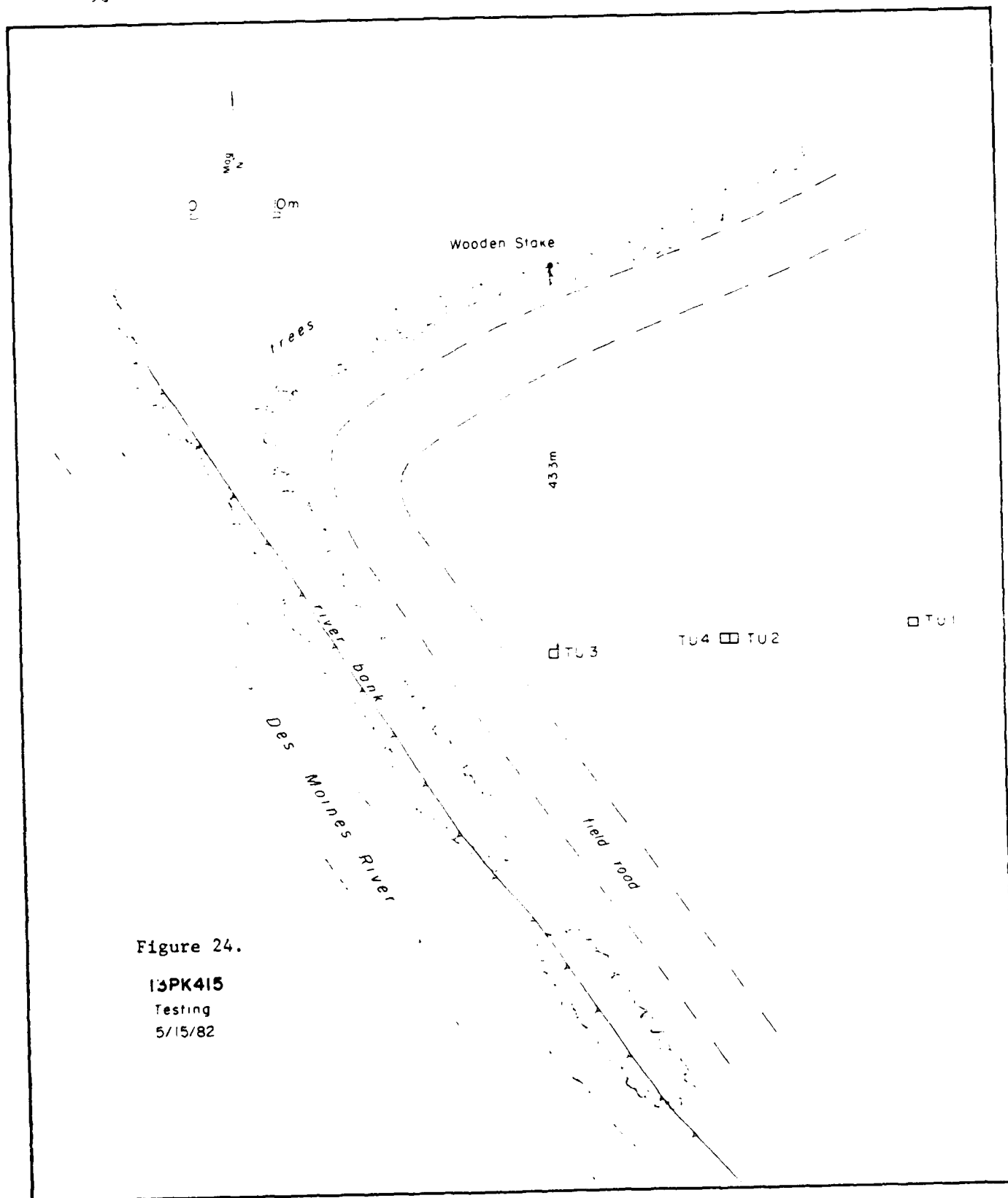


Figure 24.

13PK415

Testing

5/15/82

test unit 1

65 cm 2 fire-cracked granite cobbles
1 piece of limonite

test unit 2

20-30 cm 1 white chert waste flake
1 thin cord roughened body
sherd (grit temp.)

test unit 2 (continued)

40-50 cm 1 fire-cracked rock frag.
1 granite cobble
50-60 cm 1 fire-cracked rock frag.
1 large pebble
charcoal near rocks

test unit 3

20-30 cm 1 body sherd (grit temp.)

test unit 4

30-40 cm 1 fire-cracked granite cobble
60-70 cm 1 fire-cracked basalt cobble

investigations: The scope of work called for surface collecting, if possible, and excavation of a 2 m X 2 m test unit. In 1982 surface collecting could not be undertaken because the site was covered by dense grass. Excavation was initiated by opening 3 1-meter test units spaced 20 meters or 30 meters apart. The 3 units were positioned perpendicular to the river channel across a slight rise on the TH terrace. Opening 3 widely spaced units was a strategy designed to explore the differences in terrace sediments and to investigate the density of site materials over a large area. Excavation proceeded by shovel-skimming and hand trowling, and the damp soil was not screened. When test unit 2 was found to contain the most interesting cultural evidence, a fourth test unit was excavated on the west side of unit 2. Excavations were carried to depths of 65 centimeters in unit 1, 80 centimeters in unit 2, 110 centimeters in unit 3, and 70 centimeters in unit 4.

Prehistoric cultural evidence was sparse in all test units, although clay pigeon fragments and cinders were fairly common in the plowzone. Historic trash is associated with (destroyed) farm buildings about 150 meters east-northeast of 13PK415. Pottery sherds and a flake in test units 2 and 3 represent a Woodland component in the A soil horizon, much of which has been incorporated in the plowzone. Deeper (30-70 cm) rocks and a small amount of carbon in test units 2 and 4 came from a possible pit (Figure 25), apparently also extending downward from the Woodland component. The pit, seen only in the test unit's west wall profile, consisted of a vaguely darker spot in the otherwise undisturbed profile. The opposite (east) wall of test unit 2 also contained

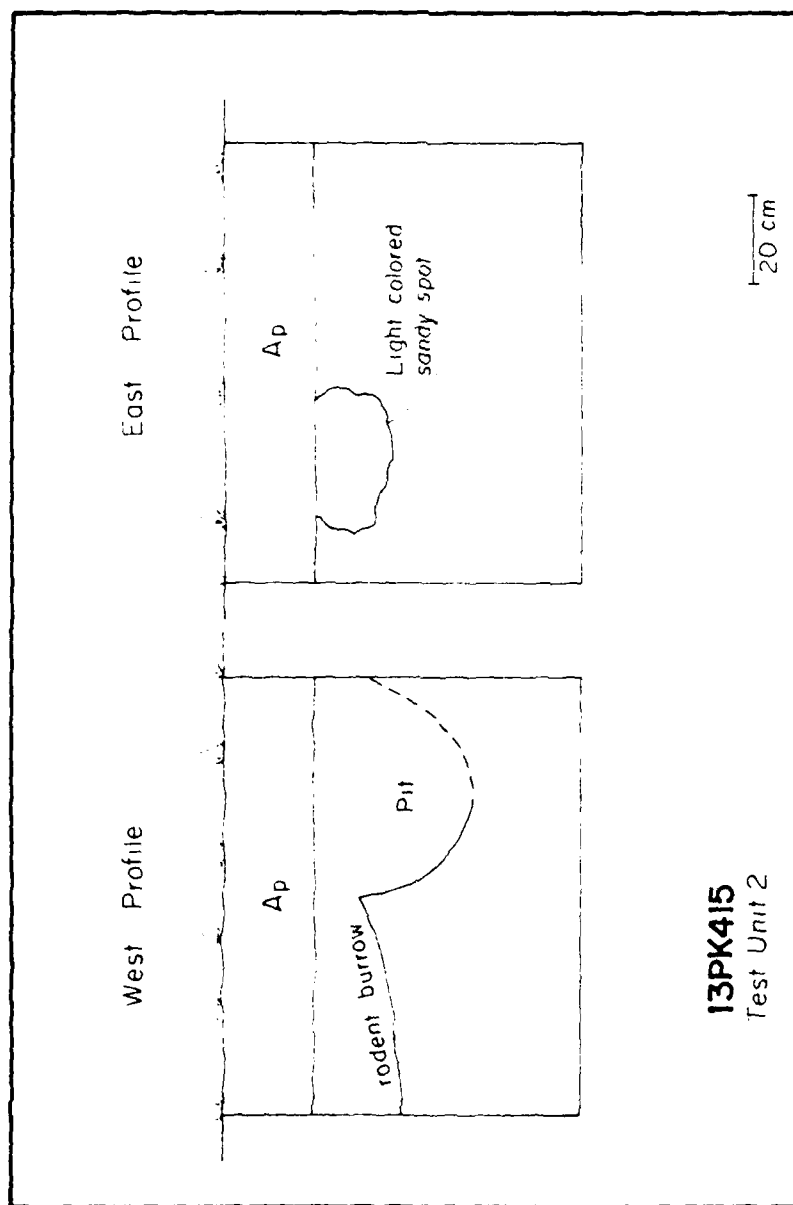


Figure 25.

a lighter spot of sandy soil (Figure 25), which seems to be additional evidence of aboriginal digging. Rocks at 65-centimeter depth in test unit 1 had no other associations. They appear to be isolated finds, deep in the soil profile, that are typical of the Downstream Corridor evidence (see "collections" for 13PK414).

The soil profile from test unit 3 is representative of that exposed in the other test units, except it is perhaps a little sandier in the B horizons.

test unit 3 (west profile)

landscape position: high terrace

parent material: alluvium

slope: 0-5%

vegetation: grass and weeds

date described: 5/15/82

depth (cm)	horizon	description
0- 20	Ap1	very dark gray brown (10YR 3/1), silt loam, firm breaking to granular, noneffervescent, sharp smooth boundary, abundant roots
20- 28	Ap2	very dark gray brown (10YR 3/1), silt loam, weak coarse, subangular blocky breaking to granular, noneffervescent, sharp smooth boundary, Ph 7.0
28- 38	A2	mottled very dark gray (10YR 3/1), silt loam, very weak fine subangular blocky, friable, noneffervescent, gradual boundary, worm casts, roots and krotovina common
38- 50	A3	mottled very dark gray brown (10YR 3/2), sandy silt loam, weak fine subangular blocky, friable, noneffervescent, gradual wavy boundary, roots, worm casts and krotivina common
50- 71	B1	mottled dark brown (10YR 3/3) and brown (10YR 4/3), sandy silt loam, weak medium subangular blocky, friable, noneffervescent, clear wavy boundary, worm casts and krotivina common
71-110 base of excavation	B2	brown (10YR 4/3), silty sand, moderate coarse subangular blocky, friable, noneffervescent, few roots

interpretations: The only diagnostic materials from 13PK415 are thin body sherds that probably are Late Woodland aged, post-A.D. 800. Other-wise materials from the site are too sparse to indicate much about site function and composition. Generally, we would regard pottery and fire-cracked rock as domestic trash.

There are several reasons why the evidence from 13PK415 is uninformative. First, when initially deposited the site may have been a thin scatter of a relatively narrow range of materials, e.g. waste rock, sherds, bones, and carbon. Secondly, the site has remained near the surface where it has been subject to intensive leaching. Thirdly, the site has been cultivated for many years, incorporating much of the material in the plowzone where it weathered quickly. Lastly, overbank sediments from Des Moines River flooding have added volume to the plowzones, further dispersing materials.

The features observed in test unit 2 amount to little more than disturbances of the natural soil profile. They were too vague to find during excavation and remarkably difficult to outline on the profile walls. Whether they represent prehistoric human activity associated with the pottery and rocks or are large rodent disturbances is a matter of speculation.

recommendations: Materials are too sparse and dispersed to identify the numbers of components and site limits of 13PK415. The remains are extensively disturbed by plowing, and leaching has removed (if ever present) evidence of features and bone. Additional information might be gained by surfacing the site, but extensive excavation would be far too costly for the return in cultural information. The site does not meet the criteria for eligibility to the National Register.

The site surface is heavily overgrown with weeds and grass, and tree seedlings have been planted. Thus, the site is not threatened by further disturbances. The river bank is not being significantly eroded in the direction of the site. It is recommended that the site remain in its present condition. If disturbances are planned in the future, controlled surface collecting is recommended as the best means of obtaining site information. Deeply buried archaeological sites may also exist at this location.

13PK424 (Figure 23)

location: Burned features, charcoal, and an occasional cobble are found in buried soil horizons along a 300-meter reach of river bank on the left side of the Des Moines River below the Sycamore bridge. The site is on two terraces, a late Intermediate terrace and a Low terrace. The elevation is 800 feet asl. Most of the site is inaccessible except on foot.

description: In 1981 isolated burn features were observed in buried soil horizons a few meters south of the Sycamore bridge and about 300 meters south of the bridge. A cobble also was found in the slump on

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TESTING NINE ARCHAEOLOGICAL SITES IN THE DOWNSTREAM
CORRIDOR SAYLORVILLE. (U) SOUTHWEST MISSOURI STATE UNIV
SPRINGFIELD CENTER FOR ARCHAEOLOG... D W BENN ET AL.
APR 83 CAR-489 DACW25-82-C-0049 F/G 5/6

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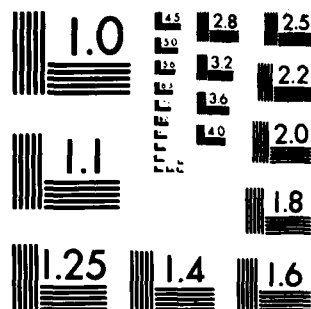
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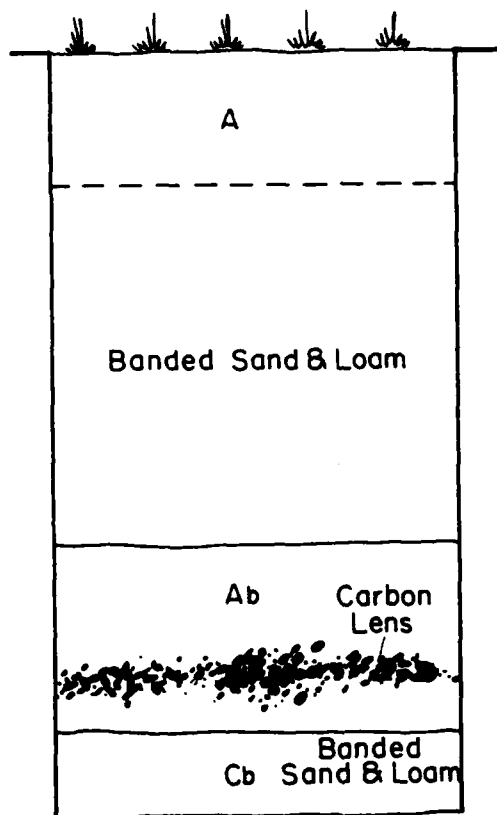


the river bank several meters away from the south location. The south feature appeared to be a hearth filled with ash. Parts of the river bank were heavily overgrown or too slumped to observe the soil profile, but large stretches of bank were clear. An acre of the site surface at the north end was a fallow field, where a late historic homestead was once located. The rest of the site was in floodplain forest. Surface and bank conditions were the same in 1982. The hearth-like feature and associated charcoal lens were still preserved in the bank at 13PK424-south, but burn features near the bridge (13PK424-north) were washed away in 1982. A forest understory of nettles and poison ivy restricted site investigations in 1982.

investigations: The proposed plan for investigation of 13PK424 called for machine trenching of the terraces to search for cultural remains. High water and wet ground cancelled any plans for trenching, which would have been impossible because of the density of the forest on much of the site. As an alternative plan of investigation, we searched the river bank for signs of cultural activity and excavated two test units near burned features in the bank.

No cultural evidence was found on the river bank to add to the 1981 finds. Test unit 1 was positioned at the north end of the site approximately 3 meters from the river bank where two burned features were observed in 1981. The unit was 1.25 m X 1 m and reached a depth of 145 centimeters. Excavation proceeded with vertical skimming of the upper 100 centimeters of recent overbank sediments and shovel-skimming of the lower 45 centimeters containing the buried soil horizons. The damp soil could not be screened. Test unit 2 on the south end of the site was positioned on the river bank to excavate the hearth-like feature and charcoal lens first observed in 1981. Unit 2 was 2.5 meters north-south (along the bank), .8 meter east-west (into the bank), and exposed a vertical profile of 113 centimeters (Figure 26; Plate 5). Excavation in unit 2 was by troweling a vertical face; surface vegetation prevented our digging down from the ground surface. Carbon samples from the feature and lens were retained for later processing. Numerous large gastropods (cf. Triodopsis multilineata Say 1821) were retained as well from the buried soil.

No cultural evidence was found in test unit 1. Only an occasional carbon fleck was noted in the silts and sands. In test unit 2 the carbon lens proved to be larger than the test unit limits, i.e. 2.5 m X .8 m. It was an irregular layer of elm (Ulmus sp) charcoal with occasional patches of burned soil beneath. The hearth-like portion of this lens was simply a particularly heavily burned spot. No cultural evidence was found. A radio-carbon date of 420 $\pm$ 50 B.P.: A.D. 1520 (Beta-4734) was obtained from the elm charcoal.



13PK424 south
Test Unit 2

20 cm

Figure 26.

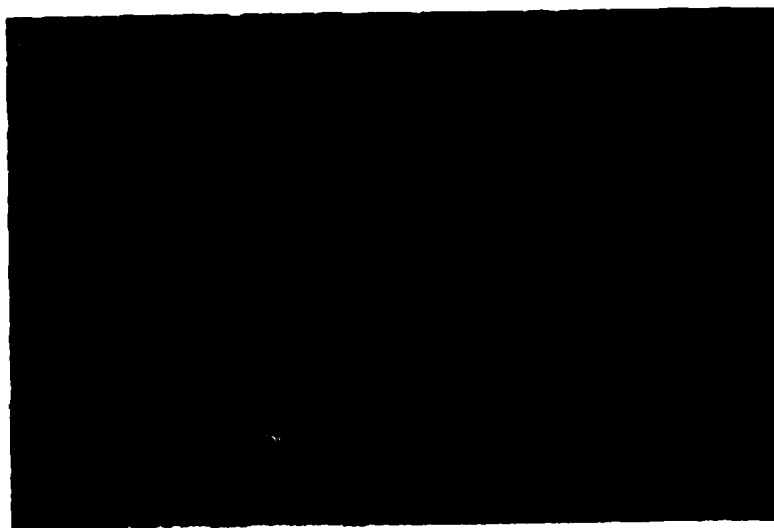


Plate 5. 13PK424. The vertical bank profile at 13PK424-south shows the buried A soil horizon (dark band) with the charcoal lens (arrow) and the lighter colored, sandy overburden.

The burned features in the north and south portions of 13PK424 were in buried A soil horizons described in the following profiles.

test unit 1 (east profile)

landscape position: late TI terrace natural levee

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 5/26/82

depth (cm)	horizon	description
0- 25	Ap	very dark gray (10YR 3/1), heavy loam, cloddy, friable, noneffervescent, abrupt boundary, common roots
25-110	C	dark brown to brown (10YR 3/3-4/3), silty sand, friable, noneffervescent, clear boundary, common roots
110-131	Ab	very dark gray to very dark grayish fine brown (10YR 3/1-3/2), sandy silt loam, weak fine subangular blocky, friable, noneffervescent, clear boundary
131-145 base of excavation	Bb	brown (10YR 4/3), sandy silt loam, very weak medium subangular blocky, friable, noneffervescent

test unit 2 (east profile)

landscape position: TL terrace

parent material: alluvium

slope: 2-5%

vegetation: floodplain forest

date described: 5/26/82

depth (cm)	horizon	description
0-ca.30	A	very dark grayish brown (10YR 3/2), silty sand, granular and loose, friable, noneffervescent, gradual boundary, common roots and worm casts

depth (cm)	horizon	description
30-110	C	pale brown to very pale brown (10YR 6/3-7/3), stratified loamy and medium sand, single grain, loose, noneffervescent, abrupt boundary
110-152	Ab	very dark grayish brown (10YR 3/2), sandy loam, granular, friable, noneffervescent, abrupt boundary, charcoal lens in lower third
152-173 base of excavation	Cb	brown (10YR 5/3), loamy sand changing to medium sand below, single grain, loose, noneffervescent

interpretations: Site 13PK424 must really be considered two separate locales, since the evidence is deposited in terrace formations of different ages, TI and TL. The northern portion of the site is on the earlier TI terrace, perhaps dating between A.D. 800 and 1500. The TL terrace began forming about A.D. 1500, according to the radiocarbon date (Beta 4734). No cultural material has been found in either locale in the site (the fire-cracked cobble find of 1981 has no context or association), and burned features are not demonstrably of a cultural origin.

Late TI terraces in the Downstream Corridor have few visible prehistoric sites, according to the 1981 survey information. This may be due, in part, to the presence of recent overbank sediments which mask buried soil surfaces and make it difficult to locate cultural materials. However, there is no proof from the 1981 survey that many prehistoric sites do exist and remain to be found by subsurface probing. In the absence of enough hard facts, we remain ambivalent about the probability of prehistoric remains in late TI terraces.

Low terraces (TL) uniformly do not yield prehistoric or early historic cultural remains, according to the 1981 bank survey. These terraces are still accreting rapidly, as evidenced by the sandy deposits overlying 13PK424-south. Unfortunately, extensive off-bank (i.e. surface) survey of Low terraces is not a useful endeavor because of recent surface sedimentation, and therefore we know little about historic or protohistoric land-use patterns on these terraces.

recommendations: There is no proof that 13PK424 is anything but a series of natural burn features. The site does not meet the criteria for eligibility to the National Register. No additional work is recommended for this locale, and no specific land-use applications are suggested. Because of the late Holocene age of the TI terrace at this location, there is a high potential for the presence of other buried prehistoric sites.

INTERPRETATIONS

In this section the results of the Downstream testing are assessed relative to the goals in the project scope of work. First we will consider what has been learned about the geomorphic approach in 1982 that was not recognized in 1981. Then, answers will be addressed to each of eleven research questions posed in the scope of work and research proposal (see Appendices I and II).

The Geomorphic Approach in Archaeology

Applications of the theories and methods of the geomorphic approach in archaeology have been employed extensively in Iowa in recent years (cf. Thompson and Bettis 1980, 1982; Bettis and Thompson 1981). In this report we must repeat many of the concepts and statements made by Thompson and Bettis on this subject since the Downstream Corridor investigations confirm and reinforce the original concepts of these writers.

The Downstream testing consisted primarily of probing sites in 1-meter units, except for the backhoe trench on 13PK414. In these test units we found that natural and cultural stratigraphy and the density of cultural materials could significantly vary within a relatively small amount of space. The complexity and variation of alluvial stratigraphy are far greater than can be appreciated using archaeological test excavations in systematic or statistical sampling procedures. Notions of statistical sampling merely cloud the problem of sampling site size and composition when the alluvial structure is not analyzed beforehand (cf. Bettis and Thompson 1981).

Structural and compositional variance was nowhere more evident than on 13PK407, the site most intensively investigated. Throughout the project the crew was continually impressed with the fact that test units offered only glimpses of the micro-structure of terraces. Details of the terrace structure could be extrapolated only between test units and not generalized to formulate patterns which represented the "typical" Des Moines River terrace. Repeatedly, we found that terraces had been eroded by later river migrations, so that much of the evidence of the past has been destroyed. As often, we discovered that terraces were and are being buried by overbank sediments, so that their internal structures are obscured.

Short of trenching the entire floodplain in systematic fashion, the most economical and informative approach to site testing in alluvium is to array test units according to the visible structure of the landform at intervals that are effective for the slope of the strata (e.g. <20-meter intervals for slopes greater than 5%). One should not expect to be able to trace the limits of a buried site by means of test excavating, since individual components are difficult to extrapolate between test units unless they are clearly associated with defined strata. Given these

conclusions, it may be observed that much site testing could be accomplished by solid core drilling with little loss of information (see Thompson and Bettis 1980).

The characteristic structure of Des Moines River terraces is illuminated by the stratigraphy in the backhoe trench on 13PK414 (Figure 27). The trench transected the TH terrace in an east-west direction rather than north-south, the direction of most river bank profiles. The base of the trench excavation followed the rise and fall of sandy point bars and intervening river chutes. Overlying the point bars and channels are silty sediments in which a buried soil horizon has developed. The thickness of the A horizon varies with its position over the chutes, and likewise its relief varies 40 to 80 centimeters or more. A radiocarbon date from a river bank feature immediately above the buried A horizon is 5990±100 B.P.* (Beta-2634). Silty and loamy overbank sediments have buried the A horizon at least 1.2 meters beneath the surface, and the surface soil has developed in these sediments. The multi-dimensionality of this terrace is strikingly evident in the facts that: a) there are two very different surfaces varying in age, contours, texture, and elevation; b) the lower surface is removed from easy sampling due to its depth; c) the surface sediments almost completely mask the subsurface structures and contours; d) exposures in the river bank do not reveal the complexity of the terrace transverse to the bank. Archaeological sites are likely to occur in the buried soil and anywhere in the overlying overbank sediments, but the geomorphic context of a site will be different according to its position. For instance, in the buried soil, sites are likely to be found only on the point bar, which would have offered better drainage. On the other hand, sites in the overbank deposits might be found anywhere on this well-drained surface.

Profile number: T1 (see Figure 27)

location: Downstream Saylorville Reservoir, center Sec. 5, T79N, R24W

landscape position: high terrace, eastern edge of chute

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 10/22/82

depth (cm)	horizon	description
0- 23	Ap	black (10YR 2.5/1), loam, cloddy, friable, non-effervescent, abrupt smooth boundary, abundant roots

*corrected date

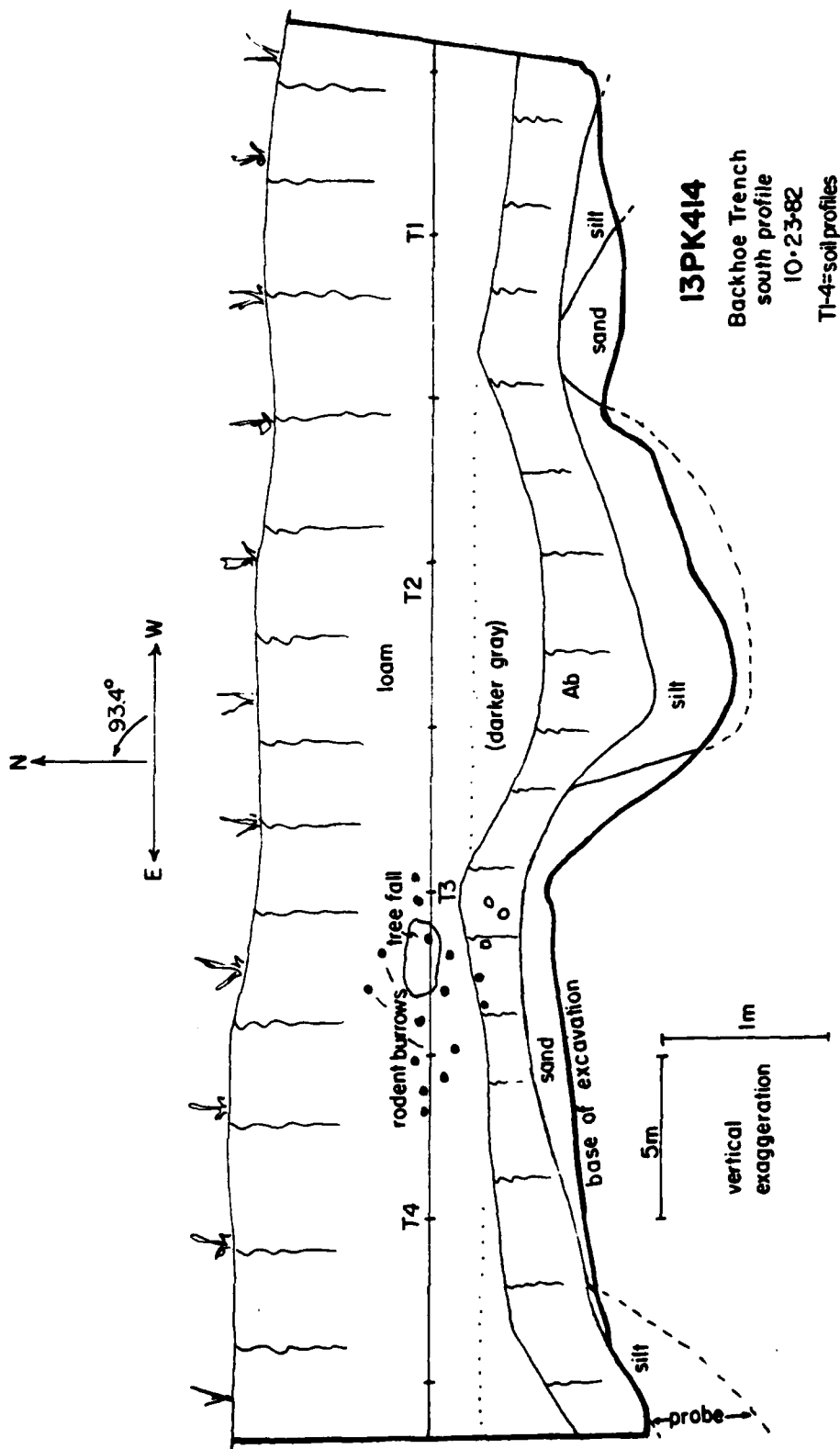


Figure 27.

depth (cm)	horizon	description
23- 41	A ₂	very dark grayish brown and dark brown (10YR 3/2 and 3/3), loam, weak medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, few medium dominantly vertical tubules, very few thin, discontinuous, very dark grayish brown (10YR 3/2) coatings on ped surfaces
41- 63	B ₁₁	brown (10YR 4/3), loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth, boundary, common roots, common medium vertical tubules containing thin almost continuous very dark grayish brown to dark brown (10YR 3/2-3/3) coatings, few thin discontinuous dark brown (10YR 3/3) cutans
63- 84	B ₁₂	dark brown (10YR 3/3), heavy loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, few roots, abundant medium vertical tubules containing thin continuous very dark grayish brown to dark brown (10YR 3/2-3/3) coatings, common thin discontinuous very dark grayish brown to dark brown (10YR 3/2-3/3) cutans
84- 99	B _{21t}	brown (10YR 4/3), heavy loam, moderate medium subangular blocky, friable, noneffervescent, clear smooth boundary, few roots, tubules with coatings as above, common thin continuous dark grayish brown (10YR 4/2) cutans
99-124	B ₂₂	dark brown (10YR 3/3), loam, weak medium subangular blocky, friable, noneffervescent, clear smooth boundary, common fine distinct dark reddish brown (5YR 3/2) accumulations, common fine vertical tubules contain thin almost continuous very dark grayish brown (10YR 3/2) coatings, very few thin discontinuous very dark grayish brown (10YR 3/2) cutans
124-137	B ₃	very dark grayish brown to dark brown (10YR 3/2-3/3), silt loam, weak medium subangular blocky, friable, noneffervescent, abrupt smooth boundary, abundant fine distinct dark reddish brown (5YR 3/2) accumulations, few roots, tubules with coatings as above, common thin discontinuous dark gray (10YR 4/1) cutans
137-158	Ab	dark grayish brown (10YR 4/2), silt loam very weak medium subangular blocky, friable, noneffervescent, gradual smooth boundary, accumulations as above, few roots, common fine horizontal and vertical tubules, few thin discontinuous dark gray (10YR 4/1) cutans

depth (cm)	horizon	description
158-170	Bwb	dark grayish brown to brown (10YR 4/2-4/3), loam, very weak medium subangular blocky, friable, non-effervescent, accumulations as above
170-180m	C ₁	brown (10YR 4/3), loam, massive, friable, noneffervescent, abrupt smooth boundary, accumulations as above
180-203	C ₂	dark yellowish brown (10YR4/4), sandy loam, massive, friable, noneffervescent, clear smooth boundary, abundant fine dark brown (10YR 3/3) accumulations
203-base of exposure (226)	IIC	yellowish brown (10YR 5/4), medium sand, single grain, loose, weak to strong effervescence, accumulations as above, common fine soft carbonate concretions

Profile number: T2 (see Figure 27)

location: Downstream Saylorville Reservoir, center Sec. 5, T79N, R24W

landscape position: high terrace, approximate center of chute

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 10/22/82

depth (cm)	horizon	description
0- 18	Ap	black (10YR 2.5/1), loam, cloddy, friable, noneffervescent, abrupt smooth boundary, abundant roots
18- 31	A ₂	very dark gray (10YR 3/1), loam, weak medium subangular blocky, friable, noneffervescent, clear smooth boundary, abundant roots, common medium and fine horizontal and vertical tubules
31- 41	A ₃	very dark gray to very dark grayish brown (10YR 3/1-3/2), loam, weak medium to fine subangular blocky, friable, noneffervescent, gradual smooth boundary, abundant roots, tubules as above.
41- 61	B ₁	dark brown (10YR 3/3), loam, moderate medium to fine subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, common medium vertical tubules

depth (cm)	horizon	description
61- 76	B ₁₁	dark brown (10YR 3/3), loam, moderate medium sub-angular blocky, friable, noneffervescent, gradual smooth boundary, common roots, common medium vertical tubules with few thin discontinuous very dark grayish brown (10YR 3/2) cutans, common krotovina
76-112	B ₁₂	dark grayish brown to brown (10YR 4/2-4/3), heavy loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, few roots, common medium vertical tubules with common thin continuous very dark grayish brown (10YR 3/2) coatings, common thin discontinuous dark grayish brown (10YR 4/2) cutans, common krotovina
112-135	B ₂₁	dark brown (10YR 3/3), loam, moderate medium sub-angular blocky, friable, noneffervescent, gradual smooth boundary, few roots, tubules with coatings as above, few thin discontinuous dark grayish brown (10YR 4/2) cutans, common krotovina
135-155	B ₂₂	very dark grayish brown (10YR 3/2), heavy loam, weak medium subangular blocky, friable, clear smooth boundary, common fine distinct dark reddish brown (5YR 3/2) accumulations, very few thin discontinuous dark grayish brown (10YR 4/2) cutans
155-165	B ₃	dark brown (10YR 3/3), heavy loam, weak medium to fine subangular blocky, friable, noneffervescent, abrupt smooth boundary, abundant fine distinct dark reddish brown (5YR 3/2) accumulations, few thin discontinuous dark grayish brown (10YR 4/2) cutans
165-180	Ab	very dark grayish brown (10YR 3/2), silty clay loam, weak medium subangular blocky, friable, noneffervescent, clear smooth boundary, accumulations as above, common thin discontinuous dark grayish brown (10YR 4/2) cutans
180-206	Bwb	very dark grayish brown to dark brown (10YR 3/2-3/3), heavy loam, massive, friable, noneffervescent, abrupt smooth boundary, accumulations as above
206-224	Ab	very dark grayish brown (10YR 3/2), silty clay loam, weak to moderate fine subangular blocky, friable, noneffervescent, clear smooth boundary, accumulations as above, common thin almost continuous dark grayish brown (10YR 4/2) cutans

depth (cm)	horizon	depth
224-252	C ₁	dark brown to brown (10YR 3/3-4/3), loam, massive, friable, noneffervescent, abrupt smooth boundary, abundant fine to medium distinct dark reddish brown (5YR 3/2) accumulations, thin medium sand lens at the base
252-274	C ₂	dark brown to brown (10YR 3/3-4/3), silt loam, massive, friable, weak to moderate effervescence, abrupt smooth boundary, accumulations as above, very few soft carbonate concretions
274-base of expo- sure (285)		yellowish brown to light yellowish brown (10YR 5/4-6/4), fine to medium sand, single grain, loose, weak effervescence, common medium faint brown (10YR 4/3) mottles

Profile number: T3 (see Figure 27)

location: Downstream Saylorville Reservoir, center Sec. 5, T79N, R24W

landscape position: high terrace, point bar

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 10/22/82

depth (cm)	horizon	description
0- 20	Ap	black (10YR 2.5/1), loam, cloddy, friable, non-effervescent, abrupt smooth boundary, abundant roots
20- 33	A ₂	very dark grayish brown (10YR 3/2), loam, weak medium to fine subangular blocky, friable, noneffervescent, clear smooth boundary, common roots, common, medium and fine horizontal and vertical tubules
33- 46	A ₃	very dark grayish brown (10YR 3/2), loam, weak medium subangular blocky, friable, noneffervescent, gradual smooth boundary, common roots, tubules as above
46- 61	B ₁	very dark grayish brown to dark brown (10YR 3/2-3/3), loam moderate medium subangular blocky, friable, non-effervescent, gradual smooth boundary, few roots, common medium predominantly vertical tubules with thin discontinuous very dark grayish brown coatings, few thin discontinuous very dark grayish brown (10YR 3/2) cutans, common krotovina

depth (cm)	horizon	description
61- 81	B ₁₂	dark brown to brown (10YR 3/3-4/3), loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, few roots, tubules with coatings as above, very few thin discontinuous very dark grayish brown (10YR 3/2) cutans, common krotovina
81-104	B ₂₁	brown (10YR 4/3), loam, moderate medium subangular blocky, friable, clear smooth boundary, very few roots, few medium vertical tubules with thin discontinuous very dark grayish brown (10YR 3/2) coatings, cutans as above, common krotovina
104-119	B ₂₂	dark grayish brown to brown (10YR 4/2-4/3), loam, weak medium subangular blocky, friable, noneffervescent, abrupt smooth boundary, few fine faint very dark grayish brown (10YR 3/2) accumulations, very few roots, very few thin discontinuous dark brown (10YR 3/3) cutans, common krotovina
119-147	Ab	dark grayish brown (10YR 4/2), heavy loam, very weak medium to fine subangular blocky, friable, noneffervescent, clear smooth boundary, common fine faint very dark grayish brown (10YR 3/2) accumulations, very few roots, common krotovina
147-175	C	dark brown (10YR 3/3), sandy loam, massive, friable, noneffervescent, clear smooth boundary, common fine faint brown (10YR 4/3) accumulations
175-base of expo- sure (188)	IIC	dark yellowish brown (10YR 4/4), medium sand, single grain, loose, noneffervescent

Profile number: T4 (see Figure 27)

location: downstream Saylorville Reservoir, Center Sec. 5, T79N, R24W

landscape position: high terrace, west edge of large chute

parent material: alluvium

slope: 0-5%

vegetation: fallow field

date described: 10/22/82

depth (cm)	horizon	description
0- 23	Ap	black (10YR 2.5/1), loam, cloddy, friable, non-effervescent, abrupt smooth boundary, abundant roots
23- 38	A ₂	very dark gray (10YR 3/1), loam, weak medium to fine subangular blocky, friable, noneffervescent, clear smooth boundary, common roots, few medium vertical and horizontal tubules
38- 53	A ₃	very dark grayish brown (10YR 3/2), loam, moderate medium to fine subangular blocky, friable, non-effervescent, gradual smooth boundary, few roots, tubules as above
53- 76	B ₁₁	dark brown (10YR 3/3), loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, few roots, common medium vertical tubules, few thin discontinuous very dark grayish brown (10YR 3/2) cutans
76- 99	B ₁₂	dark brown (10YR 3/3), loam, moderate medium subangular blocky, friable, noneffervescent, clear smooth boundary, few faint coarse dark gray to dark grayish brown (10YR 4/1-4/2) mottles, few roots, common medium vertical tubules with common thin almost continuous very dark gray (10YR 3/1) coatings, very few thin discontinuous very dark grayish brown (10YR 3/2) cutans
99-127	B _{21t}	dark brown (10YR 3/3), heavy loam, moderate medium subangular blocky, friable, noneffervescent, gradual smooth boundary, very few roots, common medium vertical tubules, with common thin almost continuous very dark grayish brown (10YR 3/2) coatings, common thin discontinuous very dark grayish brown (10YR 3/2) cutans
127-150	B ₃	dark brown (10YR 3/3), heavy loam, weak medium subangular blocky, friable, noneffervescent, abrupt smooth boundary, common fine distinct dark reddish brown (5YR 3/2) accumulations, few medium vertical tubules, very few roots, few thin discontinuous very dark grayish brown (10YR 3/2) cutans
150-173	Ab	dark grayish brown to brown (10YR 4/2-4/3), loam, weak medium subangular blocky, friable, noneffervescent, clear smooth boundary, accumulations as above, common medium horizontal and vertical tubules

depth (cm)	horizon	description
173-198	C	brown (10YR 4/3), loam, massive, friable, non-effervescent, abrupt smooth boundary, abundant fine distinct dark reddish brown (5YR 3/2) accumulations, very few roots
198-base of expo- sure (218)	IIC	brown to yellowish brown (10YR 5/3-5/4), loamy sand, massive, very friable, noneffervescent

The conclusions concerning site testing and trenching echo the epistemology presented in Chapter III of this report: that alluvial strata should be the primary focus of research designs considering archaeological resources in floodplains. The terrace sequence described in 1981 (see Chapter III) was confirmed by the 1982 testing, or at least confirmed to the extent that no information contradicted the previous model. Details were added to the model as well. For instance, radiocarbon dating of materials from soils on TL and late TI terraces (e.g. 13PK405, 13PK407, 13PK424; Table 1) indicated that these terraces were part of a continuous sedimentation process; i.e. late-stage TI4 formation was contemporary with early-stage TL formation. At 13PK424 a TL terrace was mistaken in 1981 for part of a TI terrace (partly due to tree cover and modern sedimentation), and we are certain that the demarcation between different-aged terraces is obscured in other parts of the Downstream Corridor. This process of continuous terrace formation and obscuring of structures occurred in the past and must be considered in the cases of TH and TBC terraces.

Archaeological sites are deposits stemming from interaction between human beings and their environment. Existence of cultural deposits is dependent upon the history of orderly environmental changes, which are both sedimentary and climatological. The fact of environmental changes, also called natural site formation processes (Rathje and Schiffer 1980: 127), has significant implications for the management of diminishing cultural resources. We know that natural fluvial processes have destroyed and always will destroy part of the sedimentary (and cultural) record of the past. It is argued in some instances that the rates of destruction are increased by modern engineering, industrial, and domestic development, such as controlling river levels, constructing dams, and building in the floodplain. Whether or not man exacerbates the rate of destruction, is it not futile to believe that specific components of the cultural resources can be preserved in place, given the inevitability of destruction by ordered fluvial processes (cf. Thompson and Bettis 1982:21)? We prefer to take the position that all known and suspected cultural resources must be studied together in their natural environment, so that we can develop a natural and cultural framework as a context for considering the significance of certain cultural sites that might be impacted by modern development. To focus on artifacts, individual sites, and direct short-term impacts is an eclectic procedure that will never service the need to understand human motivations in the context of natural processes.

Research Problems and Results of Site Testing

Eleven research questions for the project, as listed in Chapter III and Appendix II, are discussed in the following pages.

1. Phase II testing was intended to determine how a representative sample of sites is preserved in the alluvial landscape, as modeled in 1981. Two corollary questions were: are the 1981 survey findings and predictions corroborated, and can the Downstream Corridor findings be applied to sites in the Saylorville Reservoir area?

We have already stated that the 1982 information (e.g. radiocarbon dates, relative ages of terraces, site stratigraphy) largely confirmed the 1981 models. The 1982 testing revealed that in 1981 there was a tendency to underestimate the internal complexity of terrace structures because rapid surveys approach the limits of geomorphic resolution. We found that existing sites and their material assemblages tend to be well-preserved in the alluvium, with plenty of reliable contexts and associations between materials being observed. On the other hand, many of the tested sites were damaged or nearly destroyed by bank erosion. Indeed, buried sites are visible to surveys because they have been partially destroyed! On the matter of applying Downstream site findings to other, previously excavated sites in the valley, we are certain that significant parallels exist. However, it is difficult to be analytical in any comparisons without undertaking an extensive program of literature search and analysis. For instance, site 13PK149 (Osborn and Gradwohl 1981:99) appears to be on a TH or TI4 terrace, according to its landform position, internal stratigraphy, and radiocarbon age. There is evidence for domestic habitations at 13PK149, and its higher elevated, less flood-prone terrace position would suggest the potential for longer-term, intensive settlement. Likewise in the Downstream Corridor the TH and TI4 terraces contained more prehistoric and historic settlements than lower terraces. Another site, 13PK183 (op cit.:275), is on a low TI terrace and has a post-A.D. 800 occupation buried below overbank deposits--a context similar to 13PK407 in the Downstream Corridor. Site 13PK183 is interpreted as a seasonal hunting and resource processing locus--functions that must have taken place at many low TI terrace sites in the Downstream Corridor. A final site for comparison is 13PK252 (op cit:330), consisting of a few chert flakes and artifacts scattered on a low TI terrace. The ISU investigators had difficulty with interpreting this site because of its small collection and lack of stratigraphic context--problems which are repeated in the Downstream Corridor. The three sites exhibit sufficiently strong parallels between sites in the Downstream Corridor and in the Saylorville Reservoir to suggest that a stratigraphic approach to site context should be ardently applied to the latter area.

2. What are the best methods for testing buried sites (given budget and time restraints) which have been discovered through fortuitous exposures along cutbanks?

We have argued that, in terms of realistic budgets, there is not enough money to fund systematic testing of all impacted sites in alluvium. The use of test units arrayed to fit the landform in combination with drilling and very limited machine excavation are the best methods to analyze the structure of the landform in which the site is deposited. The efforts of testing of alluvial sites are best directed toward determining whether or not significant portions of a site still exist, or have already been destroyed, and determining how cultural deposits are arrayed in a terrace volume. Extensive analysis of site composition, internal variation, and site limits should be addressed during the stage of intensive excavation/salvage investigations (i.e. Phase III).

3. Is a site like 13PK414 typical of Middle to Late Archaic sites that might be deeply buried in the terrace systems of major rivers? Where are the base camp sites of Archaic periods?

There is minimal evidence that 13PK414 represents a human occupation at ca. 6000 B.P., and flakes buried in the TH terrace at other locations in the Downstream Corridor imply the presence of several Archaic age sites in the floodplain. Since these sites yield little material, they cannot be intensive, domestic habitations (base camps). Archaic base camps may be situated on higher (Wisconsinan) terraces and benches and on alluvial fans located at the base of the bluff line in the Des Moines River valley. Other potential base camp locations are on the interfluvies (i.e. ridge spurs) overlooking the valley bottoms.

4. What is the nature of sites on low terraces along the Des Moines, such as six of nine to be tested (excluding 409, 410)?

The tested sites yielded little material from which to interpret function, but we may speculate that 13PK405 and 13PK414 were hunting/processing sites while 13PK407, 13PK413, and 13PK514 have some domestic trash indicative of short, seasonal occupations. The latter three sites, being Oneota, Great Oasis, and Late Woodland sites, are certainly not typical examples of these culture types; usually these peoples left much more trash. In every aspect, the Downstream sites on TI and TH terraces appear to have been special processing and/or temporary camping sites. This applies to all culture periods, Archaic through late prehistoric. The presence of considerable amounts of sandy and silty alluvium above cultural components, coupled with evidence of recent (e.g. 1975) floods that covered elevations up to the TH terrace, indicate that these sites could not have been occupied during the wettest seasons--spring and portions of the summer. Therefore, we conclude that the floodplain was utilized in similar patterns from Archaic through late prehistoric times. Charcoal and carbon features are unusually common on low terraces. The several carbon features in deep levels at 13PK407 are good examples of this phenomenon. Possibly, the vegetation on potential living areas was cut and burned by prehistoric peoples to render the low terrace environs more habitable.

5. Oneota sites exist north of the Raccoon/Des Moines rivers juncture, contrary to previously published accounts (Gradwohl 1974; Osborn and Gradwohl 1981). Sites located on low TI4 terraces may have been destroyed by river meandering. What are the interpretative possibilities for joint Oneota/Great Oasis occupation of the central Des Moines valley?

The single known Oneota site in the Downstream Corridor, 13PK407, is on a TI4 terrace and radiocarbon dated A.D. 1240 and 1715. We believe that many TL terraces replaced TI terraces as the Des Moines River meandered, and it was the late TI terraces (i.e. TI3-4) that were removed due to their proximity to the meander belt. Oneota sites probably were removed with the terrace formations. This systematic site destruction, coupled with lack of stratigraphic survey in the Saylorville Reservoir, probably is responsible for recent perceptions that Oneota is not present immediately north of Des Moines. In defense of such perceptions, however, it is noteworthy that 13PK407 was only seasonally occupied, and very little diagnostic Oneota trash was left behind. Lacking pottery, sites of this type could easily be dismissed as "Woodland" (cf. 13PK183; Osborn and Gradwohl 1981:275). The presence of small, temporary Oneota sites is not widely proclaimed among Midwestern archaeologists. Most attention is given to large sites of several acres with enormous amounts of trash. The nearest enclave of large Oneota sites is the Moingona phase (Gradwohl 1974), concentrated south of the City of Des Moines. Here, villages are located on second terraces or interfluvies (i.e. ridges and hogbacks overlooking the valley). The diagnostic ceramics have interior rim and lip decorations as well as instances of handles and lugs (ibid.), attributes that do not show up on the 13PK407 specimens. Perhaps, the Downstream Corridor site (13PK407) is part of a pattern of temporary hunting and processing camps located up-river from the base camps below Des Moines.

Great oasis villages are present in the Saylorville Reservoir (Gradwohl 1974). A small Great Oasis component is located in the Downstream Corridor on a TH terrace (13PK413). If this manifestation dates approximately A.D. 900-1300 (Gradwohl 1974:97; Henning 1971, 1982), it may be earlier than the Oneota occupation in the central Des Moines River valley. More data must be gathered concerning all types of sites and their radiocarbon ages.

6. Will Woodland sites yield sufficient ceramics for comparison to other known ceramic traditions in Iowa, or will some sites be aceramic?

The 1982 testing produced very few Woodland ceramics for several reasons. Some sites did not yield Woodland components (e.g. 13PK407), and others (e.g. 13PK405) may be too late. Site 13PK415 was heavily leached and plowed, actions which destroy pottery. Site 13PK410 contained inexplicably little pottery, unless we assume that excavations were positioned on the fringes of the primary habitation. Site 13PK413 also produced little Woodland evidence (one sherd), but there are no natural formation processes that might explain why so little was found. Thus, we know there are three Woodland sites (13PK410, 413, 415) on TH or stream terraces

where intensive habitations would be anticipated. Here, the living surfaces are on well-drained soils above all but the highest flood level. The relatively low incidence of pottery, especially at 13PK413, indicates long-term domestic activities were not pursued in the floodplain. Woodland sites on TI and TH terraces in the floodplain appear to have been occupied seasonally for short periods of time, and their ceramic assemblages are too small for statistical analysis and comparison with other collections.

7. Is there evidence of a relationship between Woodland ceramic wares and Great Oasis wares? Do both kinds of wares occur on the same sites?

Site 13PK413 is the only location that produced evidence of Woodland and Great Oasis. Not enough ceramics were found to make comparisons. Henning (1971, 1982) has argued that Great Oasis culture has the essential elements of Woodland culture patterns, and evidence from Saylorville Lake excavations (Osborn, Gradwohl, and Thies 1978) places Late Woodland ceramics (i.e. Saylor ware) in a contemporaneous context with Great Oasis. Elsewhere (Benn et al. 1981) it has been argued that the western Prairie Peninsula and Plains supported a patchwork of Woodland cultures at the time Great Oasis was developing. Considering all of this, it would be surprising if it were proved that Great Oasis and other Late Woodland groups did not coexist in the central Des Moines valley.

8. Is there significant negative evidence for Middle Woodland period occupations in the Downstream Corridor?

The only possible evidence of Middle Woodland presence is the Marshall Barbed-like projectile point from 13PK414, slim evidence indeed. TI(3) terraces of probable Middle Woodland age are not accessible for survey in three-dimensions; only their surfaces can be examined in any detail. Therefore, temporary camp and procurement sites of Middle Woodland affiliation may not have been located yet. No Middle Woodland villages are known on the TH terraces, and none has been reported on the TBC terraces. In short, evidence for utilization of the floodplain by Middle Woodland peoples is ambiguous. Work by Iowa State University (see Gradwohl 1974; Osborn and Gradwohl 1981) has not resolved these questions for the whole of the central Des Moines valley by providing systematic data on the locations of Middle Woodland sites and unambiguous identifications of Woodland ceramic types and wares. Perusal of the ISU publications cited above does reveal that the central Des Moines valley was inhabited by Middle Woodland peoples, perhaps in enclaves of relatively intensive occupation. One such enclave existed in the area around the Boone Mound (13BN29) and the associated village (13BN30) at the upper end of Saylorville Lake. Aggregation of Middle Woodland populations may have been an important aspect of their social/settlement patterns, leaving portions of major river valleys under-exploited.

9. Is there evidence (e.g. settlements, artifact assemblages) for a significant economic change between A.D. 400-800, the period when horticulture changed economies?

No such evidence was found in the Downstream Corridor investigations. All sites, with the exception of 13PK410 on Rock Creek, appear to have been temporary camps and/or procurement/processing stations. Lower terraces adjacent to the river channel probably provided raw materials that were always necessary to pre-state societies of all types--for instance, materials such as fish, muskrat, mussel, fiber, bark, berries, and wood.

10. What types of macro- and micro-remains might be recovered by fine-screening floating site sediments from floodplain contexts. What natural and cultural factors might influence the composition of remains recovered by fine-screening and flotation techniques.

The composition of floodplain soil sample fractions (floated and fine-screened) is not appreciably different from what has been observed in sites on other types of landforms. Floodplain sediments often need chemical defloculation to break down loamy and clayey fractions for complete recovery of cultural remains, and large fragile gastropod shells must be hand picked from the soil matrix prior to floating. Otherwise, large gastropod shells will be destroyed. Mussel shells, once suspected to be natural inclusions in alluvial soils, did not appear in the test excavations except in association with other cultural materials. Charcoal, carbonized seeds, and small bones (Table 2) were found in abundance in our flotation samples, indicating that the fluvial activities of the river did not carry away (i.e. naturally float) all cultural evidence. Indeed, post-occupational sedimentation appears to have been gentle enough to seal cultural deposits in place in many sites. Fine screening at 13PK407 did produce two especially positive results. Chert micro-flakes were discovered in a cultural feature in site deposits that otherwise yielded only one large flake! This instance may be a case for supposing that chipped stone artifacts were utilized and resharpened at the site but not disposed in the midden. Also a carbonized oat (wild or domestic) seed was recovered from feature 1 at 13PK407. This seed identified the feature as historic; otherwise there were no diagnostic artifacts recovered to indicate the cultural affiliation of the feature or the relative age of its context.

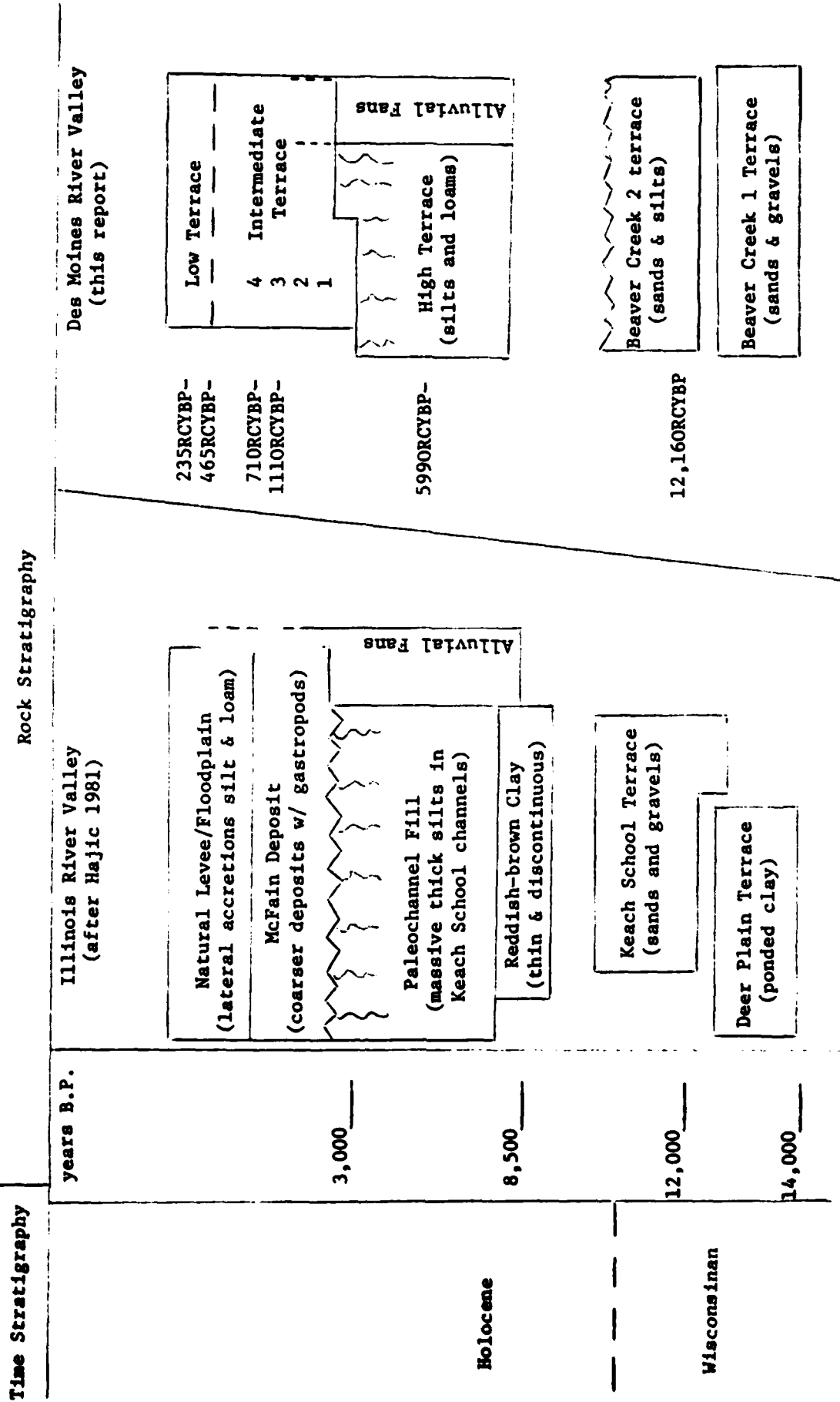
11. Can data gained from site testing in the Downstream Corridor be integrated with models developed from the survey to achieve a long-term program of studying the cultural resources and geomorphic history of the central Des Moines valley?

The 1982 testing produced radiocarbon dates and details of macro-stratigraphy in terraces which assisted in refining and confirming the 1981 models. With the same researchers accomplishing both the survey and testing investigations, the gathering of repetitive data was kept to a minimum.

Outside the Des Moines River valley there are terrace models that parallel the one we have developed for the central Des Moines valley. In particular, we recognize Hajic's (1981) analysis of the lower Illinois River valley stratigraphy as essentially similar to the Downstream Corridor. In the lower Illinois River valley, Hajic has described a series of seven stratigraphic units that compare favorably with five stratigraphic

units in the Des Moines valley (Figure 28). The sequence spans the late Wisconsinan and Holocene, with each of the units being dated by relative and absolute means. Of particular interest in the comparison of these two valleys is the apparent synchronicity of fill units; for example, note the comparison of TBC terraces in the Des Moines valley with the Keach School and Deer Plain terraces in the Illinois valley, and the comparison of the High terrace (TH) with the Paleochannel fill in Illinois. It appears as if rock stratigraphic units may have some relevance as time stratigraphic units as well, perhaps because some units across the mid-continent are related to significant climatic events. The late Wisconsinan terraces are related to episodes of rapid glacial wasting, resulting in heavy flows of outwash materials. Likewise, the mid-Holocene terraces and alluvial fans developed during a warmer episode, the Hypsithermal. What remains for investigation is to learn what contributions to terrace building and erosion were made by local parent materials, regional climates, and hillslope processes within individual drainage basins (i.e. complex response).

Figure 28
Comparison of Holocene Alluvial Fills in the Midwest



VI

SUMMARY RECOMMENDATIONS AND CONCLUSIONS

The 1982 testing in the Downstream Corridor was relegated to investigating nine sites that were endangered by construction activities or the erosive actions of the Des Moines River. The primary purpose of this work was to evaluate nine sites in terms of their research potential in terms of the criteria for eligibility to the National Register of Historic Places (Table 3). The sites were found to be of variable importance. Two (13PK411, 424) no longer (if ever) contain evidence of human activity. Three sites (13PK405, 409, 415) are small, partially destroyed, and do not meet the National Register criteria of significance. One site (13PK414) contained insufficient evidence to meet the criteria for eligibility to the Register, but in case of future impacts the right-of-way should be tested for significant cultural deposits. Three sites (13PK407, 410, 413) are significant resources for research and do meet the criteria for nomination to the Register. Furthermore, 13PK407, the Christenson site, is recommended for bank protection to preserve its integrity or for immediate salvage excavation. Salvage is preferred over bank protection because of the long-term potential for bank erosion.

Five of the six prehistoric sites (excluding 13PK410) tested in the Corridor have sparse scatters of artifacts distributed over less than one acre to more than three acres. Chipped stone artifacts and flake debitage are rare on the five sites. In most cases pottery sherds outnumber chipped stone items. Bones from small and large sized mammals and a few birds are preserved on most sites, and fire-cracked, charcoal, and burned earth flecks are relatively common. Features are rare and when present contain little or no trash. In sum, the five sites have all of the aspects of temporary hunting or other resource procurement stations. Had they not been preserved by rapid burial in alluvium, such small sites would have disappeared because of surface weathering or disturbance (i.e. plowing). Furthermore, the five sites range in age from Archaic to protohistoric, implying that there was a consistent use of the floodplain by peoples of differing culture periods and economic bases. The sixth site (13PK410), a more intensively occupied one on a stream terrace, is a type of site more familiar to archaeologists.

The problem of locating and evaluating floodplain sites is a constant concern in this report, and one that apparently usurps discussion of archaeological evidence as well as cultural interpretation. The crux of this problem is that archaeology in alluvial deposits is subject to the natural force that originally created sites, i.e. water. During one field season (e.g. 1981) many sites might be exposed along river banks when the water flow is low, and sites on low terraces away from the river can be inspected by drilling in the dry soil. In the next season (e.g. 1982) constant rain and high river flows may render sites inaccessible and cause

Table 3
Summary of 1982 Testing and Recommendations

	terrace	size	age (C14)	cultural affiliation	investigations	impacts	recommendations
13PK405	T1	1/2 acre	(A.D. 1740)	?	bank survey excavation backhoe	bank erosion plowing construction public use residential	DOE preserve in place salvage
13PK407	T14	1 1/2a	(A.D. 840 1240 1715)	(Woodland?) Oneota	+	+	+
13PK409	T14	1a	19th-20th centuries	historical trash	Na	Na	-
13PK410	stream terrace	4a	mid-late Holocene	Archaic Woodland	Na	Na	if necessary
13PK411	T14	0	proto- historic	Na	+	+	-
13PK413	TH	3a	mid- Holocene	Woodland Great Oasis	Na	Na	if necessary
13PK414	TH	75m bank	mid- Holocene	Woodland Archaic	+	+	-

Table 3 (continued)

	terrace	size	age (C14)	cultural affiliation	investiga- tions			impacts				recommendations		
					bank survey	excavation	backhoe	bank erosion	plowing	construction	public use	residential	DOE	preserve in place salvage
13PK415	TH	2a	mid-late Holocene	(Woodland)	Na	+	-	Na	+	-	-	-	-	-
13PK424	TI-TL	2 finds	late Holocene	Na	+	+	-	+	-	-	-	-	-	-

Na = not applicable

elimination of parts of a field research design. In plain fact, the tactical problems of working in alluvium are barriers to accomplishing adequate sampling designs on archaeological sites. When difficulties relating to water are overcome, there is the question of evaluating sites not ordinarily occurring in archaeological samples. We are referring to the uncertainties in evaluating sites which are well-preserved beneath plowzones but consist of only a few fire-cracked rocks, a scattered charcoal and burned earth or isolated artifact finds. For instance, how does one determine the limits of diffuse scatters which are only accessible by excavation, or how can we be certain that a burned area is not a hearth but instead is a natural burn? To the first question we surmise that one can adequately determine the limits of the landform where the site is located but not necessarily the limits of the site. As for the second question, we believe that all potential human evidence (e.g. isolated rocks, burned patches, charcoal lenses, soil disturbances) must be scrutinized, because it is just this kind of minimal evidence that is well preserved by rapid burial in alluvium. The search for minimal human evidence tends to result in over-estimating the significance of a cultural resource during the initial stage of work (i.e. survey). When such "minimal" sites are tested, they may contain embarrassingly little material or, worse, no evidence of human activities.

If the reader detects a pragmatic tone in the discussion of the previous paragraph, then this is what is intended. This and the 1981 survey report for the Downstream Corridor have not been able to develop quantitative estimates for site densities and distributions in the floodplain, and our qualitative statements concerning site positioning and composition have been modified at each step of the investigation. Attempts at quantifying and qualifying data using familiar archaeological methods--e.g. surface and bank survey, test excavations--have been thwarted by two culprits typical of alluvial landscapes: its enormous volume and its structural complexity. Perhaps the traditional epistemology of archaeological survey and testing has reached its limits in alluvial settings (see Bettis and Thompson 1981). In particular, the discipline's emphasis on statistical sampling, finite site limits, and concepts of "significance" (vis-à-vis the National Register) have constrained many researchers' perspectives such that important data are either ignored or forced into irrelevant or fallacious interpretations. Forgotten is the fact that the archaeological record is the dependent variable in a fluvial system. Hence, one cannot conduct empirical studies of archaeological facts independent of the broader sedimentary contexts. A correct evaluation of archaeology in alluvial volumes would entail imaginative, unconstrained investigations that cover broad areas of varying landforms. The intent of this investigation would be data collection (e.g. site survey, landscape evolution, geomorphic site context, radiocarbon material) to reveal regularities in site context, density, and patterning.

In consideration of the findings from the Downstream Corridor site testing, we present the following recommendations for future work in the Des Moines River valley.

1. We have argued that, because of the inevitability of river meandering, sites preserved for short-term planning will not necessarily be preserved for long-term management. Long-term preservation of cultural resources in floodplains will demand more than a passive, i.e. nonimpacting, role on the part of the managing agency. Periodic bank surveys, perhaps every decade, are one means of assessing continuing impacts due to river bank erosion. Another means of locating buried, undisturbed sites susceptible to future erosion would entail an intensive, systematic probing (e.g. drilling, test pitting, remote sensing) of selected terraces for the purposes of developing quantitative models about site density and positioning in the terrace structures.

2. Detailed information about cultural and geological resources in the Des Moines valley is available for only the Downstream Corridor floodplain and small parts of the Saylorville Reservoir area. This information can be integrated only by considering the whole of the valley structure, bluff-to-bluff. A cost-effective means for integrating this information would involve a valley-wide reconnaissance survey by an archaeologist and a geomorphologist. Selected transects of the valley would be chosen for study areas. Goals for this work would include: confirming the geomorphic structures and sequence, locating sites with diagnostic remains, drilling selected locations to correlate landforms, and obtaining material for radiocarbon dating. The resultant valley-wide model of archaeological and geomorphic relationships would be comparable to other models being developed in the Midwest.

3. A study should be launched to integrate the archaeological data from the Saylorville Reservoir area with the geomorphological information from the Downstream Corridor, and out of this to develop new interpretations about the prehistoric culture history of the central Des Moines valley. The proposed study would involve a literature search, evaluation of site collections, processing of radiocarbon dates, and on-site visits to locations in and around the reservoir that are not submerged.

ACKNOWLEDGEMENTS

The undertaking and completion of the Downstream Corridor testing project would not have been possible without the cooperation and assistance of many individuals. The field crew consisted of Tara Reuter, Colleen Vaughn, and Jeff Fine. We thank E. Arthur Bettis for making his spare time and editorial efforts available to the project, and we appreciate the cooperation of the Iowa Geological Survey for releasing Bettis to the project. We annually express our appreciation to Dean Thompson for his interest in and logistical contributions to the on-going Downstream projects, and special appreciation goes to Dean for his careful reading of the theoretical sections of the report. Various stages of the project were assisted by personnel from the U.S. Army Corps of Engineers, among whom we single out James Osche, Jeff Logston, Skip Smith, and Larry McLean. Maps and drawings for the report were done by David Massey. Mildred Wilcox did the report editing, and the typist was Bianca Lawrence.

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APPENDIX I
COE Request for Proposals

PART I - Section C, Description/Specification1. PROJECT OBJECTIVES.

The following described service contract requires the scientific testing of eight archaeological sites for the determination of further recovery interest and the preparation of a comprehensive report on the results. The Contractor will also be required to prepare determinations of eligibility of the sites for listing in the National Register of Historic Places as deemed appropriate by the Corps of Engineers, Rock Island District, in consultation with the Iowa Division of Historic Preservation. Such investigation shall provide the information to determine the potential of the sites to answer current research objectives. This action is in accordance with the National Historic Preservation Act of 1966 (PL 89-655), the National Environmental Policy Act of 1969 (PL 91-190), Protection and Enhancement of the Cultural Environment (EO 11593), the Archaeological and Historical Preservation Act of 1974 (PL 93-291), and the project Memorandum of Agreement, as amended.

2. PROJECT BACKGROUND.

(a) The Downstream Corridor extends for 9.1 river miles on the Des Moines River from Saylorville Dam to the 6th Avenue bridge in Des Moines, Iowa (see map). Beaver Creek, a right bank tributary, enters the Des Moines River within the study area. The corridor lands involve approximately 1,500 acres which lie entirely within the flood plain of the Des Moines River. The corridor ranges from 600 to 7,600 feet in width and land uses are now 20% undeveloped, 40% agricultural cropland, and approximately 40% flood plain forest.

(b) A reconnaissance survey of the corridor lands was performed by Environmental Research Center, Iowa City, Iowa, in 1975 under subcontract with Roy F. Weston, Inc., Wilmette, Illinois, entitled, "The Des Moines River Greenbelt Corridor Recreation Project: An Assessment of Archaeological Resources", Research Report Number 15. This survey effort discovered two sites, both north of the combined Interstate Highways 35-80, which were identified as potential seasonal prehistoric camp sites.

(c) Twenty six prehistoric and twelve historic archaeological sites were identified within the downstream corridor as the result of an intensive survey by Luther College Archaeological Research Center under contract DACW25-81-C-0027. Additional information for the eight prehistoric sites to be tested under this contract is available from the draft report entitled "Archaeological and Geomorphological Survey of the Downstream Corridor, Saylorville Lake, Iowa" by David W. Benn (Principal Investigator) and E. Arthur Bettis, III (Soil Scientist and Geomorphologist).

(d) The prehistoric sites recommended for further testing are designated as follows:

13 PK 405	13 PK 411
13 PK 406	13 PK 414
13 PK 407	13 PK 415
13 PK 410	13 PK 424

Only preliminary data is available for these sites and interested parties should contact the Rock Island District Archaeologist for more detailed information. Currently

PART I - Section C, Description/Specification (Continued)

available information is as follows:

13 PK 405 - Possibly Woodland; 1-2 acres in extent covered by approximately 1 foot of overburden; endangered by erosion.

13 PK 406 - Lithic scatter; possibly an acre in size; being eroded by all terrain vehicle traffic.

13 PK 407 - The Christianson site; a remnant of an Oneota site with at least one additional component 1 meter down; the site extends 100 meters along the riverbank and may cover 3-4 acres inland. Pits, house floors, and hearths are exposed in the bank which is rapidly eroding. Three shell tempered body sherds were recovered; one is undecorated, a second has a "nested chevron-and-dot" motif, and the third has a "bullseye with central dot" motif. The Oneota component is covered by 1 foot of alluvium and may be undisturbed. Testing here should be both extensive and intensive. Bone and snails are present and well preserved.

13 PK 410 - The Schmidt site; this was partially destroyed by a road; it appears to be multi-component (Archaic, Woodland) although testing needs to be done to address that.

13 PK 411 - This is in the same geologic position as PK 407 and may also be an Oneota site. It is stratified and eroding badly; a charcoal layer is intermittently present about .5 meters below the A horizon exposed in the riverbank. Cultural evidence is exposed along approximately 50 meters of riverbank on the east side of the river.

13 PK 414-415 - These are considered together as their definition is problematic. They are both on a high Mid-Holocene terrace. PK 415 is a Woodland site that appears in the plowzone. 13 PK 414 is 1.5 to 2 meters down and is stratified with charcoal. It appears to be late Archaic.

13 PK 424 - This site was identified on the basis of two hearths and burned earth. It is on a point bar three hundred meters long covered by 1 meter of alluvium and heavy vegetation. This stratified site probably contains several components distributed over the surfaces of the point bar hence the testing strategy should be designed to determine the extent and composition of cultural deposits.

(e) In formulating proposals, consideration should be given to faunal data and charcoal and particularly to the Oneota components which were previously thought to be concentrated downstream of the confluence of the Raccoon River with the Des Moines. Because of the imperiled situation and potential data at 13 PK 407, more work should be planned for it than for the other sites. This should be specifically identified in the proposal.

PART I - Section C, Description/Specification (Continued)**3. SPECIFICATIONS.**

(a) The Contractor shall undertake testing of selected archaeological sites as described in this Section C, Description/Specification. Such services shall be performed in a manner to insure the greatest contribution to an understanding of the prehistory of Iowa. Performance of contract services shall be made by qualified personnel in close cooperation with the State Historic Preservation Officer and the District Archaeologist.

(b) The Principal Investigator shall be responsible for preparing a comprehensive report on these investigations. This report will be in the format as described in Exhibit I (attached). A set of USGS maps showing individual site locations and boundaries will be provided by the Contractor but shall not be included in the main body of the report. Basic data description, including provenience and metrics, UTM coordinates for all sites, and photographs and drawings will be provided for use both in support of the author's arguments and conclusions and as a source of basic information that may find wider use by other archaeologists.

(c) Prospective contractors will propose a plan for each site, specifically detailing personnel and support requirements necessary to recover the significant data from each site recommended for further work (see item VII of Report Format).

(d) Prior to acceptance of the final report by the Government, neither the Contractor nor his representatives shall release any information or material of any nature obtained or prepared under the contract without prior approval of the Contracting Officer. After acceptance of the final report, its reproduction and use shall not be restricted by either party. The appendix containing the exact site locations will not be included in reports released to the public. Any artifacts or cultural material collected and any notes, photographs, and data generated during the performance of contract services shall be curated with the Principal Investigator for preservation upon completion of the contract, but at the discretion of the SHPO and the Rock Island District. All artifacts, notes, photographs, samples, and other data will remain the property of the US Government and shall be made available upon request by the District Cultural Resource Designee, Rock Island District, for interpretive programs or additional research purposes. All data generated by this contract shall be curated in one place. It is the Contractor's responsibility to safeguard all of this material and provide an inventory and catalog system to facilitate access.

4. FIELD SERVICES.

(a) Testing. Each of the following archaeological sites will be tested in accordance with Contractor's proposal.

13 PK 405	13 PK 411
13 PK 406	13 PK 414
13 PK 407	13 PK 415
13 PK 410	13 PK 424

The purpose of this testing is to obtain the following information for each site:

- (1) the horizontal and vertical extent of the site,
- (2) the number of cultural components represented at the site,

PART I - Section C, Description/Specification (Continued)

(3) the stratigraphic position of each component in relation to the geomorphological setting,

(4) type or types of activity and cultural affiliation represented by each component (for instance, is the component a midden or is it a village site, and what activities are inferred to have occurred),

(5) the relationship between the site, the environment, and surrounding resources,

(6) the current status of the site; disturbed, totally mixed, undisturbed; also the vertical and horizontal extent of the disturbances,

(7) the six research questions listed in Exhibit II must also be addressed.

(b) Testing Methodology. Proposals must include a plan detailing field strategy in relation to techniques to be employed for testing each site. The plan must include a schedule of field activities, sampling strategies and goals, laboratory analysis procedures, and any consultant services necessary to answer the above questions. The plan will also include provision for necessary professional level geomorphological studies to identify and define the sequence, depth, and extent of soil development and locate layers of sterile overburden.

In order to attain maximum cost effectiveness without jeopardizing the significant informational content of the archaeological sites, the Contractor shall, wherever possible, make appropriate use of power machinery for test trenching, test pitting, and removal of plowzone, sterile overburden, and natural strata devoid of cultural material. Power equipment as referred to in this instance includes, but is not limited to, road graders, backhoes, bucket loaders, trenchers, and power augers.

5. SCHEDULE.

(a) Field Work. Will commence within 21 calendar days of date of contract.

(b) Testing Schedule. Contractor will submit a work schedule such as a bar graph indicating expected order of work and rate of progress for each site prior to commencing field work.

(c) Monthly Progress Reports. By the tenth day of each month, the Contractor will submit a Memorandum for Record to indicate status of contract progress. This memorandum will indicate specific activity and accomplishments during the preceding month and any scheduled tasks for the following month. A minimum of three good quality color slides of each site under investigation will be furnished with the appropriate monthly report.

(d) Comprehensive Report. A draft report will be submitted to the Contracting Officer for review 160 calendar days after date of contract. The final report will be due 45 calendar days after receipt of the Contracting Officer's comments on the draft report. The Contractor shall furnish the Corps of Engineers

APPENDIX II

Center for Archaeological Research Proposal

DOWNSTREAM CORRIDOR SITE TESTING,
DES MOINES RIVER, IOWA, 1981
CAR-489

Research Goals for the Testing

The principal purpose of testing eight sites in the Downstream Corridor is to determine if these are significant cultural remains being destroyed by erosion along the Des Moines River. Thus, the eligibility of the sites for nomination to the National Register of Historic Places is the most important question to be answered. Sites will be investigated for their eligibility to the NRHP by determining what types of information they might yield that would answer some of the most pressing problems concerning prehistoric occupations of peoples in the Des Moines valley. The research problems that we will address in testing the eight Downstream Corridor sites are: (six questions posed in the RFP are reconsidered here as well).

1) The primary purpose of the Phase I survey (Benn & Bettis 1981) was to formulate a preliminary model of Holocene landscape evolution in the central Des Moines valley and to determine if and where cultural deposits were preserved in that landscape. The Phase II testing should be directed toward determining how a representative sample of sites is preserved in the alluvial landscape. There are two corollaries to this question: a) were the survey findings and predictions (e.g. concerning landscape position, stratification) correct? b) can we apply the Downstream Corridor findings to other (already) excavated sites in the vicinity (cf. Osborn & Gradwohl 1981), i.e. reinterpret other sites according to the new model of landscape evolution?

2) What are the best methods for testing buried sites (given budget and time restraints), which have been discovered through fortuitous exposures along cut-banks? Five of the eight sites to be tested fall in this category. Will

combinations of variously-sized test squares (one meter, 2x2m), backhoeing, and trenching on a small scale provide sufficient information without destroying significant portions of the site. (Extensive destruction amounts to site salvage --i.e. Phase III--not testing.) Can analysis of the parameters of the landform (e.g. terrace formations, soils, diagnostic sediments) where the site is situated be substituted for extensive deep testing, which is time consuming and costly?

3) Is a site like 13PK414 typical of Middle to Late Archaic sites that might be deeply buried through the terrace systems of major rivers? If 13PK414 is a temporary, seasonal site or a special procurement station, where are the base camp sites of these Archaic periods?

4) What is the nature of sites on low terraces along the Des Moines, such as six of the eight to be tested (excluding 410, 415)? What was the elevation of these sites relative to the river level at the time of occupation? Were they seasonally inundated, thus excluding the period of inundation from potential seasonal occupations in the floodplain? Did floodplain occupation strategy change through time? Are sites on point bars different from sites on stable soil surfaces?

5) (REP #1) New data from the Downstream Corridor (Benn & Bettis 1981) indicates that Oneota sites exist north of the Racoon/Des Moines juncture (cf. 13PK407, perhaps 411). Possibly these sites are (were) on the lowest (T14) terraces, many of which have been destroyed in the last 1000 years of Des Moines River meandering. Great Oasis sites exist in the same area (a GO site overlooks 13PK410). These observations complicate the interpretive possibilities of Great Oasis-Oneota relationships: a) Oneota moved in as Great Oasis moved out; b) the two cultures coexisted in the same area for some period of time--either as adversaries or in a tandem relationship, i.e. each group using a different part

of the ecosystem; c) Oneota and Great Oasis had symbiotic ties--Oneota were primarily horticulturalists and Great Oasis were primarily hunters with the two exchanging products.

6) (RFP #2) Woodland components at 13PK405, 406(?), 407, 410, 415, and 424(?) might yield some ceramics that can be compared with eastern and western Iowa types, as well as with Saylor ware (Osborn et. al. 1978). It is more likely that most of the Corridor sites were seasonally occupied and will yield very few ceramics--perhaps some will be aceramic. Such "aceramic" sites represent a portion of the Woodland settlement pattern that is ordinarily very difficult to identify in plowed or otherwise disturbed upland locations.

7) (RFP #3) Late Woodland, cord impressed ceramics (Saylor ware, and perhaps an earlier unnamed type) might be similar to Great Oasis wares in terms of the application of single cord decorations, paste characters, and squared lip forms. The presence of both Woodland and Great Oasis ceramics on the same sites, in addition to morphological similarities, would certainly imply a cultural-evolutionary relationship. A site like 13PK415 might yield information relevant to this problem.

8) (RFP #4) I am unaware of any Middle Woodland materials on any of the eight project sites, and most of these sites are on landforms that do not contain sediments of the Middle Woodland age. 13PK410 has the most potential for yielding Middle Woodland materials. On the other hand, the negative evidence for significant Middle Woodland period occupations in the project area is important for determining the nature of that socio-economic system.

9) (RFP #5) Horticultural data is best gathered by conducting flotation projects on sites of Woodland and later ages. Other evidence--e.g. site positioning on

on alluvial soils (that can be cultivated by slash and burn techniques), presence of horticultural implements such as "hoes"--has proved to be unreliable for indicating the presence or evolutionary stage of horticulture. Evidence of economic changes (e.g. shifts in settlement and seasonality) is sometimes attributed to the introduction of horticulture, especially for the time period A.D. 400-800.

10) (RFP #6) Recovery of botanical macro- and micro-remains has undeniable value for reconstructing the prehistoric setting and climate. Test excavations in the Downstream Corridor present an opportunity to recover these materials from floodplain contexts, a relatively unusual situation. It may be necessary to "hand-pick" the largest gastropods from soil samples, rather than floating them out of the matrix, due to their fragile nature. Another problem to be confronted in the floodplain environment is the presence of mussel shells and whether they are natural inclusions in the sediments or were culturally introduced.

11) Because the archaeologist and geomorphologist were involved in the initial survey of the Downstream Corridor (Benn and Bettis 1981), the testing being proposed herein is viewed as a continuation of the long-term process of studying the cultural resources and geomorphic history of the central Des Moines River valley. Data gained from site testing is realistically an accumulation of knowledge that began with the Downstream Corridor survey as well as with earlier work in the Saylorsville Reservoir by Iowa State University.

Procedures for Testing Sites

Field procedures will be designed to accommodate the unique characteristics of each site and its geomorphic position in the landscape. Therefore, the numbers, depth, and configuration of the test excavations (including machine work) will vary as outlined in subsequent paragraphs of this proposal. Our general methodologies apply to all of the sites, however, and they are as follows.

Hand excavations will involve procedures that recognize rapid removal of sterile deposits and careful inspection of cultural layers. Overburden (usually modern) will be removed by shoveling for small units and by the backhoe for large units. Test squares and blocks will be widely spaced (20m or more) to provide coverage of large, buried terrace surfaces. Cultural layers and obvious soil horizons will be hand trowelled in arbitrary 10cm levels (natural stratigraphy in these layers is rare) with the backdirt being screened through one-quarter inch mesh. Soil samples (6-9 liters) will be collected from each cultural unit and features that are excavated; these will be processed by flotation and fine screening (#40 mesh) to recover botanical and micro-remains. Sterile layers between cultural levels will be shovel-skipped. All meter square excavations will be carried to sub-terrace sands and gravels, or well into the B soil horizon in the case of thick terraces (i.e. where tests would have to be more than 1.5m).

Machine assisted excavation will be used sparingly so as not to needlessly disturb significant cultural deposits. Machines (e.g. backhoe, trencher) will be used for the following purposes: to cross-trench deeply buried sites (e.g. 414, 424) where large-scale hand excavation is inefficient; to remove modern overburden from excavation squares and blocks.

Sites will be tested to obtain several types of information (viz. pages 5 and 6 of the RFP). a) The horizontal and vertical parameters of the sites

will be identified at two levels of confidence: potential and absolute. The potential site limits will be identified by tracing the areal extent and depth of the terrace formation where the site is preserved. This will be accomplished by utilizing a hand soil auger, and in cases of deeply buried sites a backhoe or trencher. The absolute limits of sites will be identified by the distribution of materials in test excavations. b) The numbers of site components and their contents, morphology, and function will be obtained from test excavations. The vertical sequence of components should be distinct, but horizontal distribution of components may be only estimated, given the limited potential of testing. Site contents, etc. can only be determined if the test squares expose substantial enough deposits; thus, 2x2 meter squares will be employed sometimes (e.g. 407, 415) to search for features and artifact associations and context. c) Cultural stratigraphy and geomorphic context will be the easiest information to obtain from small test squares and backhoe trench profiles. Coupled with river bank profiles, stratigraphic information will be comparable to data obtained during the Phase I survey. d) The environment of the site (i.e. landscape position) should be evident from the geomorphic context. e) Disturbances and site integrity are already identified, in part, for all the sites (i.e. from Phase I). Testing will enhance confidence limits for the preliminary assessments presented in the Phase I survey.

Each site will be discussed in terms of the present knowledge about it (from the survey data) and how it can be tested rapidly and efficiently.

13PK405: This site consists of scattered pieces of charcoal, lithics, and bone in a mollic soil horizon in the upper portion of a T1 terrace. The mollic soil is very dark brown, friable silt loam about 30-40cm thick over a lighter brown and more sandy B horizon. The terrace ground surface is very disturbed, but in many places about 20-40cm of sandy-gravelly overburden covers the mollisol.

The site will be tested in nine man-days using three methods. 1) A hand soil auger will be used to determine the extent of the terrace formation in which the site is located. 2) The river bank profile will be cleaned and mapped to provide a vertical section through the site. 3) Four, one meter test pits will be excavated by hand in the quadrants of the site to determine integrity of the deposits away from the river bank and to obtain representative collections of cultural material. Test excavations will focus on determining if material extends into the lighter colored B horizon, where features would be more visible (test squares might be expanded to 1x2m or 2x2m to search for features).

13PK409: This site is similar to 13PK405, but the terrace it is on is smaller (an eroded remnant) and lacks the sterile overburden.

Investigation will require six man-days. 1) A hand soil auger will be employed to map the extent of the terrace formation the site is on. 2) At least three, 1m test pits will be hand excavated in a line across the site to determine depth of cultural materials, content, and integrity. At least one test pit will be excavated to sterile sand and gravel to search for other components.

13PK407: The Christianson site is on a T14 terrace that may cover more than one acre. Oneota cultural materials are in the 30cm thick mollisol near the top of the terrace. Hearths and possible house basins are visible in the mollisol, and pits filled with dark soil extend into the underlying B horizon. There is 25-30cm of overburden and plowzone on top of the site. The Oneota component contains exceptionally little material for a site of this cultural affiliation. Another component is buried in the B horizon about .5m beneath the mollisol (data A.D. 820; Beta-2633). Mammals bones and carbon were noted here.

This site will be investigated in 15 man-days in the following manner.

1) A hand soil auger will be utilized to trace the extent of the terrace formation containing the Oneota component. 2) A portion of the river bank will be

cleaned (at least down to the Woodland component--bank slump is a problem here) and profiled to provide a vertical record of the site. 3) At least 5 one meter test pits will be hand excavated in the quadrants and center of the site to: collect cultural materials from the Oneota and Woodland components, determine stratigraphy and integrity of the deposits, and to collect soil samples for later flotation. 4) We will hand excavate a 2x2m block into the Oneota component at a point where there is evidence of cultural features (i.e. house floors, hearth, pits) showing on the river bank profile--this step is to test the density and distribution of materials in the Oneota component. 5) A backhoe trench (about 10-20m long) will be excavated to sub-terrace sands and gravels (probably where the 2x2m block was excavated) to reveal the terrace morphology and to trace the extent of the Woodland component.

13PK410: The Schmidt site involves two terraces and possibly an alluvial fan located along Rock Creek near its confluence with the Des Moines River. On adjacent private property the site is cultivated, and this area also has an alluvial fan imposed on the second terrace. On Corps property the site is exclusively on the first terrace. Materials appear to be in the A soil horizon near the top of the terrace.

The site will be investigated in nine man-days with these methods. 1) At least three hand excavated test pits will be placed in a row on the site, and at least one other pit will be placed on a rise west of the known site scatter. Excavations will be carried to sub-terrace sands and gravels to search for buried components. 2) The cultivated field will be surface collected using a 10m grid, if landowner permission can be obtained.

13PK411: This site is in the same geomorphic position (T14 terrace) as 13PK407. However, an early historic plowzone has truncated much of the mollisol containing

the site, and little material or few features are evident.

The site will be investigated in six man-days by: 1) tracing the extent of the terrace mollisol with a hand auger; 2) hand excavating a 2x2m test block into the mollisol near where a cultural feature shows up on the river bank. Three additional one meter test pits will be excavated in other quadrants of the site. The one meter tests will be excavated to more than a meter depth to search for potential buried (Woodland) components. A backhoe will be employed to open a stratigraphic trench only if this site appears to be a different age and/or morphology than 13PK407.

13PK414, -415: 13PK414 consists of a single locus of cultural debris buried beneath about 160cm of sediment in the TH terrace. The site is in a buried soil, which runs along the river bank at this location. 13PK415 consists of Woodland age debris thinly scattered over the surface of a plowed field.

13PK414 will be tested in nine man-days utilizing a backhoe to remove overburden. The backhoe trench will be about 20m long and will be situated north of the cultural exposure (cultural material is exposed beneath a parking lot). The backhoe excavation will be dug to a point just above the buried soil, and the soil will be excavated by hand methods to search for cultural materials.

13PK415 will be tested in three man-days by excavating a 2x2m block to remove the plowzone, collect cultural material, and search for features and materials beneath the plowzone, a one meter square in this test block will be excavated to 1.5m in depth. If possible, the site will be surface collected in a 10m control grid (this is doubtful since the site is planted in small trees).

13PK424: This site consists of two hearths and fire-cracked rock in at least two buried soils along as much as 300m of river bank. Probably, materials or cultural loci are scattered on point bars within the large terrace system.

Much of the site has up to one meter of modern sandy overburden on it, and most

of the surface is forested.

The site will be tested in twelve man-days using two methods, and perhaps a third. 1) A backhoe will be employed to remove overburden on a 2x2m block above one hearth (where two buried soils are exposed near the Sycamore bridge--an area not in forest). Potential culture bearing deposits will be hand trowelled in this block. 2) A one meter test square will be hand excavated onto a hearth exposed in the river bank at a position where the site is forested. Both excavations will search for cultural artifacts, which are rare at this site. 3) If feasible (due to heavy forest cover), a trenching machine will be employed to cross-trench the terrace deposit in the forested area--this might reveal the extent of the terrace and potential cultural deposits. Other one meter test squares will be excavated to probe significant cultural deposits, if such deposits are located by the first 3 steps.

Facilities, Scheduling, and Personnel

Fieldwork on the eight Downstream Corridor sites is expected to require 23 days for a crew of three in addition to 12 days of field time for the archaeologist (principal investigator). This amounts to a total of 69 man-days (8 hours per day) for the crew and 12 man-days for the archaeologist (see "Procedures for Testing" for the numbers of days on each site). Forty hours of consulting time have been designated for a geomorphologist.

The field crew will consist of an experienced field director (see Harris vita) and two experienced crew members from the CAR staff. Fieldwork days will be coordinated with the teaching schedule of the archaeologist (see Benn vita) so that he can be present to assist with excavations, interpret stratigraphy and cultural features, and consult with the geomorphologist. The geomorphologist (E.A. Bettis) and archaeologist will review and analyze stratigraphic profiles at all eight sites and will direct trenching and backhoeing operations.

The scheduling of tests on individual sites will be determined by the exigencies of weather, water level in the river, and by the contents of sites. Generally, backhoeing and stratigraphic profiles will be accomplished first, along with hand coring of the sites, to identify the horizontal and vertical parameters for test excavations. The total numbers and areal extent of test excavations will depend on the extent and contents of sites, but the minimum numbers of test squares are indicated for each site in the previous section. It is anticipated that certain of the eight sites will prove to be representative of the others, and extra analytical efforts will be focused on these few sites.

Many of the eight sites will not yield large amounts of cultural material, for they appear to be thin, ephemeral scatters. Perhaps 13PK407 and 410 will be the most prolific. Analysis of cultural materials and field descriptions will be accomplished by the archaeologist. Support activities, such as cataloguing

artifacts, tabulating materials, paleobotanical and faunal analysis, and graphics will be done by CAR personnel. A research assistant (the field director) will author the fieldwork description, but all other portions of the final report will be authored by the archaeologist. Site collections and records will be curated at Luther College. All other aspects of the RFP will be adhered to.

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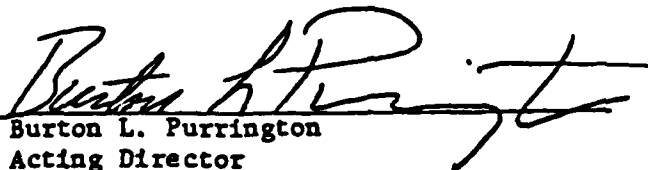
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 Burton L. Purrington
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Southwest Missouri State University

Springfield, Missouri 65804

10 April 1982

Re: amendments to the Center for Archaeological Research proposal for site testing in the Downstream Corridor.

Budget: Please find enclosed an amended budget which reflects suggested government pay scales and slightly increased amounts of time for geomorphology and the field crew.

Scheduling: The contractor may be aware that at this writing the Des Moines River level is high and flooding nearly all of the sites proposed for testing. Field work cannot start before the river level is reduced to more than half below bankful.

Cultural-Historical Framework: Currently, archaeological work being proposed for the central Des Moines River valley must utilize the cultural framework presented by Gradwohl (1974) for his investigations in central Iowa. The framework is sufficiently general so that it is likely to remain secure as new information is excavated in the future.

Late Paleo-Indian and Early Archaic culture periods are represented by surface finds of unfluted lanceolate projectile points and side notched projectiles similar to those recovered from the Cherokee Sewer site in western Iowa (Anderson and Semken eds. 1980) and from the Logan Creek complex (e.g. Agogino and Frankforter 1960). In the Downstream Corridor it is likely that all sedimentary deposits of Late Pleistocene and early Holocene ages have been almost completely eroded or destroyed by subsequent fluvial actions.

Materials of Middle Archaic age are rarely found except as surface finds on the Prairie Peninsula. In Kansas, Schmits (1978) has excavated Middle Archaic components from alluvial contexts, and a 5190 B.P. radiocarbon date from 13PK414 in the Downstream Corridor (Benn and Bettis 1981) confirms the presence of such sites in the project area. What Middle Archaic period sites in alluvial contexts are likely to yield is an unanswered question at this time, but it is certain that they will be difficult to locate and excavate in substantial quantities; for, these types of sites are deeply buried in the TH terrace. Any information about this culture period will be a contribution to the information gap of sites between Koster (southern Illinois) to the east and the Coffee site (Schmits 1978) to the west.

Late Archaic period remains are quite common in high terrace and upland contexts in the Des Moines valley. North of the Saylorville Dam at 13PK149, Late Archaic components dating approximately 1100 and 670 B.C. have been investigated by Iowa State University crews (Timberlake 1981; Osborn and Gradwohl 1981). Other Late Archaic sites are undoubtedly present on TH terraces and buried in T1 terraces in the Downstream Corridor. When these sites are excavated, they will

provide critical information about the nature of economic and social systems that were in place when later Woodland culture systems evolved.

The Iowa State University Archaeological Laboratory has located many sites of the Woodland culture periods (Early?, Middle, Late). A few large sites, such as the Boone mound and village site (13BN29), and many small camps and mound groups have been found on high terraces and uplands (Gradwohl 1974). A few Woodland sites have been found on low (TI?) terraces, where some are buried above Late Archaic components (e.g. 13BN103; Osborn and Gradwohl 1981:542). Other non-diagnostic cultural scatters must be Woodland aged because of their positioning in TI terrace deposits. According to Gradwohl (1974) the Middle Woodland ceramics have affinities with Illinois Havana ware. There is a complex of single cord decorated ceramics known as Saylor ware (Osborn, Gradwohl and Thies 1978) that seems to date between A.D. 800 and 1000. The single cord decorated ceramics are related to other eastern Iowa ceramic complexes (e.g. Minotts), but such affinities are yet to be seriously studied.

The late prehistoric period (ca. post-800 A.D.) includes a record of Oneota peoples (Moingona phase) and Great Oasis occupations in the Des Moines valley. Presently, there is some confusion about these manifestations, since their distributions and dating are uncertain. Great Oasis seems to date after A.D. 950, and Oneota is present as late as A.D. 1200 (Gradwohl 1974). Oneota components are found north of the City of Des Moines in the same reach of the river as Great Oasis sites (13PK407; Benn and Bettis 1981). A central aspect to the problem of the relationship between the two cultures is at first a geomorphic one; if 13PK407 is indicative of many Oneota sites, its situation of being buried beneath modern alluvium on low TI terraces suggests that there is much more to be learned about locating Oneota sites and revealing an overall settlement pattern.

Laboratory & Curation: The Center for Archaeological Research maintains a completely equipped laboratory for processing and preparation of materials for study and curation. Laboratory capabilities include chemical cleaning of residues from artifacts, sorting, cataloging, and boxing for storage. Also, fine screening and flotation of soil samples is accomplished. The laboratory is directed by a full time technician, Patsy Corbett, and much of the labor is done by student assistants. Artifact collections from the Downstream Corridor project will be returned to Iowa for curation at the Luther College Archaeological Research Center (Decorah), where materials from the original survey are presently stored.

Personnel:

Burton L. Purrington (acting director of CAR) Ph.D. 1971 University of Wisconsin-Madison; administrative archaeologist for the project.

David W. Benn will function as principal investigator (research archaeologist) and parttime field archaeologist; Benn will direct the geomorphic investigations, determine where and how sites will be tested, participate in part of the excavating, interpret (with the geomorphologist) the stratigraphic profiles, and author the report; he will also identify any faunal remains.

Suzanne Harris will be field director and research assistant (see budget); Harris will be the full time field director, keeping notes, photographs, collections, and administering the testing schedule; Harris will do part of the excavating and will author the section of the report concerning the types of field investigations carried out on each site.

CAR amendments pg. 3

Two field assistants will be experienced field laborers from the Center's pool of parttime personnel; these will be persons who have participated in several testing operations on sites.

Donna Key of the Center will be the multi-disciplinary specialist concerned with processing the soil samples and identifying carbonized remains.

E. Arthur Bettis (Iowa Geological Survey) will be the geomorphological consultant on a parttime basis, working on the sites when backhoe and test trenches have been prepared by the research archaeologist; in the event that Bettis is not available, David A. Castillon of the SMSU Department of Geology, will provide the geomorphic consulting.

Additional References Cited

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1960 A paleo bison-kill in northwestern Iowa. *American Antiquity* 25:414-415.

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Gradwohl, David M.

1974 Archaeology of the central Des Moines River valley: a preliminary survey. In Aspects of Upper Great Lakes Anthropology, ed. Elden Johnson. 90-102. Minnesota Historical Society, St. Paul.

Schmits, Larry J.

1978 The Coffey site: environment and cultural adaptation at a Prairie Plains Archaic site. *Mid-Continental Journal of Archaeology* 3(1):69-185.

Timberlake, Robert D.

1981 Darr-es-Shalom: the culture history and ecology of a stratified Archaic through Woodland archaeological site, Polk County, Iowa. Masters Thesis, Iowa State University, Ames.



Southwest Missouri State University

Springfield, Missouri 65804

June 17, 1982

TO: Rock Island District, Corps of Engineers
FROM: David W. Benn, Principal Investigator, Downstream Corridor Testing
RE: Proposed amendments to DACW25-82-C-0049

Item 1: Site 13PK409 should be substituted for 13PK406. Site 13PK409 is a surface site in a cultivated field. Chert flakes and debris were found with historic debris (late 20th century). While all chert has been introduced by man, it is an open question whether the flakes are of prehistoric or historic (i.e. fire-cracked or plowing) origin. Investigation of 13PK409 will consist of intensive surface collecting to obtain a large sample of the chert debris. One test unit (1x1m) will be excavated in the center of the scatter to determine the subsurface stratigraphy. If it is determined that a prehistoric component is present, at least two additional test units will be placed in the site.

Item 2: Site 13PK413 should be added to the scope of work. This is a Woodland site situated on the TH terrace. It is positioned in the lower portion of a well developed mollic soil horizon. Ceramics, chert flakes, charcoal and burned soil flecks were found in shovel test excavations. The site extends into a fallow field as well as along the terrace scarp outside (west) the fence. A proposed cycle path is planned to cross the extreme southwest corner of the site. Investigations of 13PK413 will consist of test excavations in 1x1m units placed in 20m intervals. At least 4 units will be positioned in the southwest corner of the site (i.e. in the area of the cycle path) on both sides of the fence. Three or 4 additional units will be extended along the terrace scarp to the north of the southwest corner to probe the density and distribution of the cultural scatter. Special pedological investigation will consist of analyzing the A and B soil horizons for the development of an argillic layer beneath the mollisol.

Investigation of 13PK409 and 13PK413 will follow methods and goals outlined in the original scope of work for the Downstream site testing. Site 13PK409 will require at least 1.5 man-days to complete, while 13PK413 will require at least 9 man-days to complete.

Item 3: A constant river level of 795 ft. NGVD (of 1929) or above has prevented deep testing and backhoeing on some Downstream sites. In addition the soil is saturated because of rain. High water and wet soil are expected to prevent completion of the fieldwork until the month of August, providing the unusually heavy rains cease this month. It is requested that the contract agreement be modified to read: Fieldwork will be completed in August or as soon as the river level is below 793 ft. NGVD. The draft report will be due 160 days after the commencement of fieldwork.

David W. Benn

mf

A handwritten signature, likely of David W. Benn, is written over the typed name and the 'mf' initials.

APPENDIX III

Coordination and Correspondence



DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61201

REPLY TO
ATTENTION OF:

March 10, 1983

Planning Division
Environmental Analysis

Dr. David W. Benn
Center for Archaeological Research
Southwest Missouri State University
Springfield, Missouri 65804

Dear Dr. Benn:

We have completed our review of your report entitled Testing Nine Archaeological Sites in the Downstream Corridor, Saylorville Lake, Iowa, 1982 prepared for us under contract DACW25-82-C-0049. We appreciate your responsiveness in terms of scheduling and fully meeting the Scope of Work for this project. Overall, the report is of high quality and meets both research and management objectives.

The section entitled "Review of Downstream Corridor Geomorphic Contexts" will stand as a major contribution to our understanding of landscape evolution at Saylorville Lake. Herein, geomorphological, historical, and archaeological data are integrated to form an interpretive framework that can be applied to cultural resource investigations at Saylorville specifically, and other riverine areas in the Midwest generally.

Note that the contract number is as stated above. The only modifications that will be necessary are revising discussions of site significance in accordance with National Register criteria in Title 36 of the Code of Federal Regulations, Parts 60, 63, and 800.

Enclosed are the comments from the Iowa State Historic Preservation Officer for your use. The comments from the National Park Service, Interagency Archaeological Services - Denver, are not yet available and will not be so for several weeks. Therefore, you are requested to proceed with final report preparation. The IAS comments will be forwarded to you when they become available for your information only.

If you have any questions, please call Mr. Charles Smith at 309/788-6361, Ext. 6349.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard C. Fleischman". The signature is fluid and cursive, with the first name being the most prominent.

Richard C. Fleischman
Authorized Representative of the
Contracting Officer

Enclosure

IOWA STATE HISTORICAL DEPARTMENT
DIVISION OF HISTORIC PRESERVATION

January 7, 1983

ADRIAN D. ANDERSON, DIRECTOR
STATE HISTORIC PRESERVATION OFFICER

Mr. Doyle W. McCully, P.E.
Chief, Engineering Division
Rock Island COE
Clock Tower Building
Rock Island, IL 61201

RE: Phase II report; Downstream Corridor, Saylorville Lake, Iowa

Dear Mr. McCully:

Thank you for the opportunity to review the report of Phase II work conducted in the Downstream Corridor of Saylorville Lake. We are pleased to see the integration of geomorphological investigation with archaeological data recovery. The model increases our knowledge of the Downstream Corridor, and offers the potential for greater understanding of the process at work in the Reservoir area as well. We encourage additional investigations in the Saylorville area as a whole, investigations which would synthesize existing data above and below the dam and supplement the data base with extensive geomorphological investigations.

In reference to the technical quality of report, we find that it fully meets the Scope of Work. We concur with the authors' recommendations that sites 13PK405, 13PK409, 13PK411 and 13PK424 should be cleared without any further work. 13PK410 should be submitted for nomination to the National Register; the sod should be kept in place to prevent further erosion; and if any future disturbances are planned at 13PK410, further archaeological investigations should be conducted. 13PK413 should be submitted for nomination to the National Register, and as long as the bicycle path does not cut into the site more than 20-25 meters north of the scarp edge or outside the work easement, the site should not require further work. If future plans call for land modification varying from that described above, then additional archaeological fieldwork should be conducted. 13PK414 may be cleared as long as there are no modifications planned for the site. It will need to be tested within the right of way if any part of the site is going to be modified. 13PK415 may be cleared, but if disturbances are planned, a controlled surface collection should be conducted.

As an important cultural resource subject to severe erosion at an uneven rate, 13PK407 requires immediate attention. The site should be submitted for nomination to the National Register, and since it cannot be successfully preserved in place or protected from destruction, excavations should be conducted at 13PK407 order to obtain as much information from the site as possible before it is destroyed by erosion.

IOWA STATE HISTORICAL DEPARTMENT
DIVISION OF HISTORIC PRESERVATION

ADRIAN D. ANDERSON, DIRECTOR
STATE HISTORIC PRESERVATION OFFICER

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It has been a pleasure to review this report. If you have any questions concerning the comments above, please do not hesitate to contact our office. We appreciate your cooperation and assistance in completing the review process.

Sincerely,

Mary Ann McBride / for

Adrian D. Anderson, Director
State Historic Preservation Officer

ADA/spj

cc: Henry G. Pfiester, Rock Island COE

