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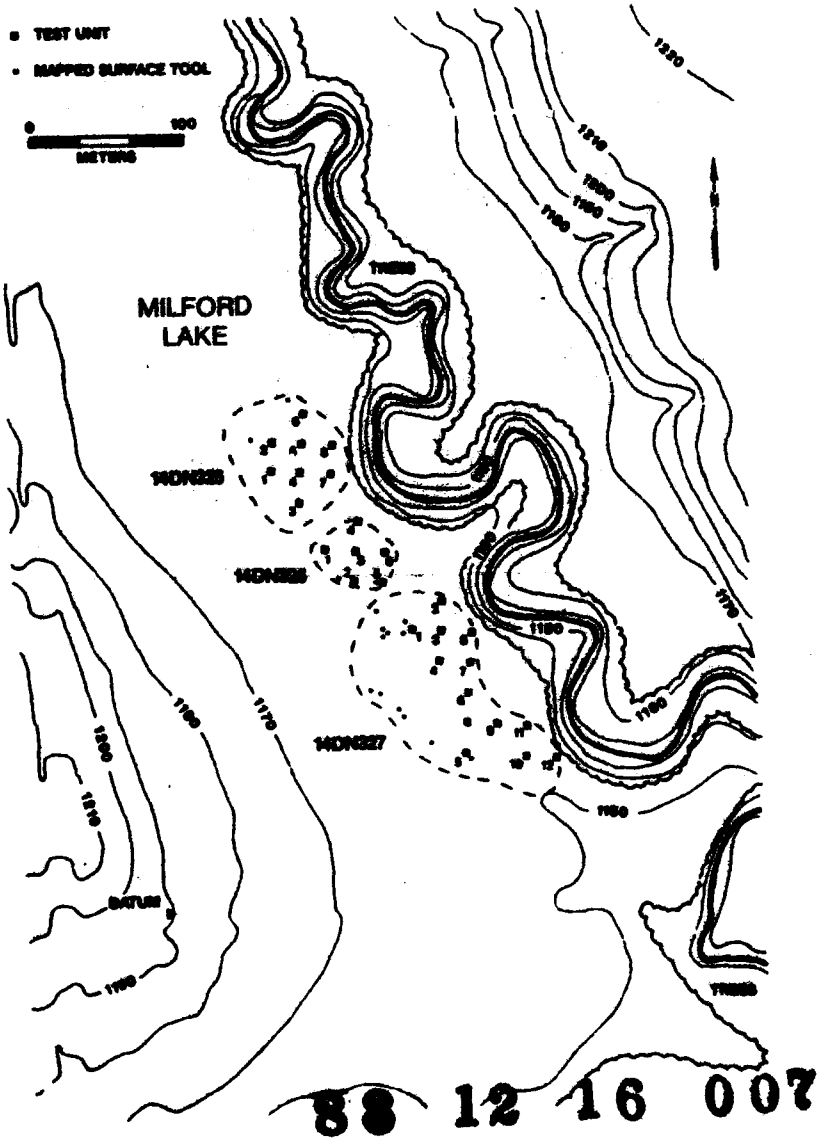
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# Archaeological Inventory and Evaluation at Milford, Melvern and Pomona Lakes, Eastern Kansas

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## Contract No.: DACW41-81-C-0149

By:
Larry J. Schmits
Editor
Principal Investigator




1988

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# ARCHAEOLOGICAL INVENTORY AND EVALUATION AT MILFORD, MELVERN AND POMONA LAKES, EASTERN KANSAS

FINAL REPORT

Submitted to:

U. S. Army Corps of Engineers
Kansas City District

Contract DACW1-81-C-0149

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Prepared by:

Environmental Systems Analysis, Inc.
Cultural Resources Division
Kansas City, Kansas

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Principal Investigator

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Archeological survey and site testing were conducted at the Melvern, Milford, and Pomona Lake Projects located in the Prairie-Plains of eastern Kansas. Melvern and Pomona Lakes are on the Marais des Cygnes River, a subbasin of the Osage River Drainage. Milford is in the Republican River Valley. At Pomona Lake, an investigation was conducted in areas normally underwater which were exposed during a drawdown period to determine the effects of inundation on known sites. Sites identified at all projects were evaluated for eligibility to the National Register of Historic Places.

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# I. INTRODUCTION

Larry J. Schmits

Milford, Melvern, and Pomona Lakes are three flood control projects located in the Prairie-Plains of eastern Kansas and operated by the U.S. Army Corps of Engineers, Kansas City District (Figure 1). More than two decades of archaeological research by the University of Kansas, Kansas State University, the Kansas State Historical Society and the Smithsonian Institution's River Basin Surveys have indicated the potential of these areas for producing significant cultural resources relating to the prehistory of eastern Kansas. The cultural resources of these lakes have been only partially inventoried. In order to provide compliance with Executive Order 11593, entitled "Protection and Enhancement of the Cultural Environment," and the National Historic Preservation Act of 1966 (Public Law 89-665), the U.S. Army Corps of Engineers contracted with Environmental Systems Analysis, Inc. for a program of archaeological surveying and testing at the three lakes (Contract DACW1-81-C-0149).

Milford Lake is located primarily in Geary, Riley and Clay Counties, Kansas, with a very small section extending into the northeastern corner of Dickinson County. The lake is situated in the Republican River valley, which is a subbasin of the Kansas River drainage system (Figure 1). Melvern and Pomona Lakes are both located in Osage County, Kansas and are situated on the Marais des Cygnes River, which is a subbasin of the Osage River drainage (Figure 1). In general, the eastern one-third of Kansas is part of the Central Lowlands province of the Interior Plains. The southern three-fourths of this province comprises the Osage Plains subprovince, within which are located the Flint Hills Uplands and the Osage Cuestas. Most of Clay, Riley and Geary counties are situated in the Flint Hills Uplands, while Osage County is located in the Osage Cuestas.

East central Kansas is primarily covered by tall grass prairie or a mosaic of tall grass prairie and deciduous forest (Figure 1). The tall grass prairie extends from North Dakota and Wisconsin southward to central Oklahoma, and is dominated by bluestem (Andropogon), indian grass (Sorghastrum) and switchgrass (Panicum). Stands of eastern deciduous forest are also found in the area, principally along streams and on hillsides. These woodland communities are dominated by oak-hickory forest (Quercus-Carya) and floodplain forest (Populus-Salix).

The present investigations were designed to provide for archaeological survey and site testing and geomorphic investigations in the project areas. These cultural resources studies are mandated by the National Historic Preservation Act of 1966 (Public Law 89-665) as amended.

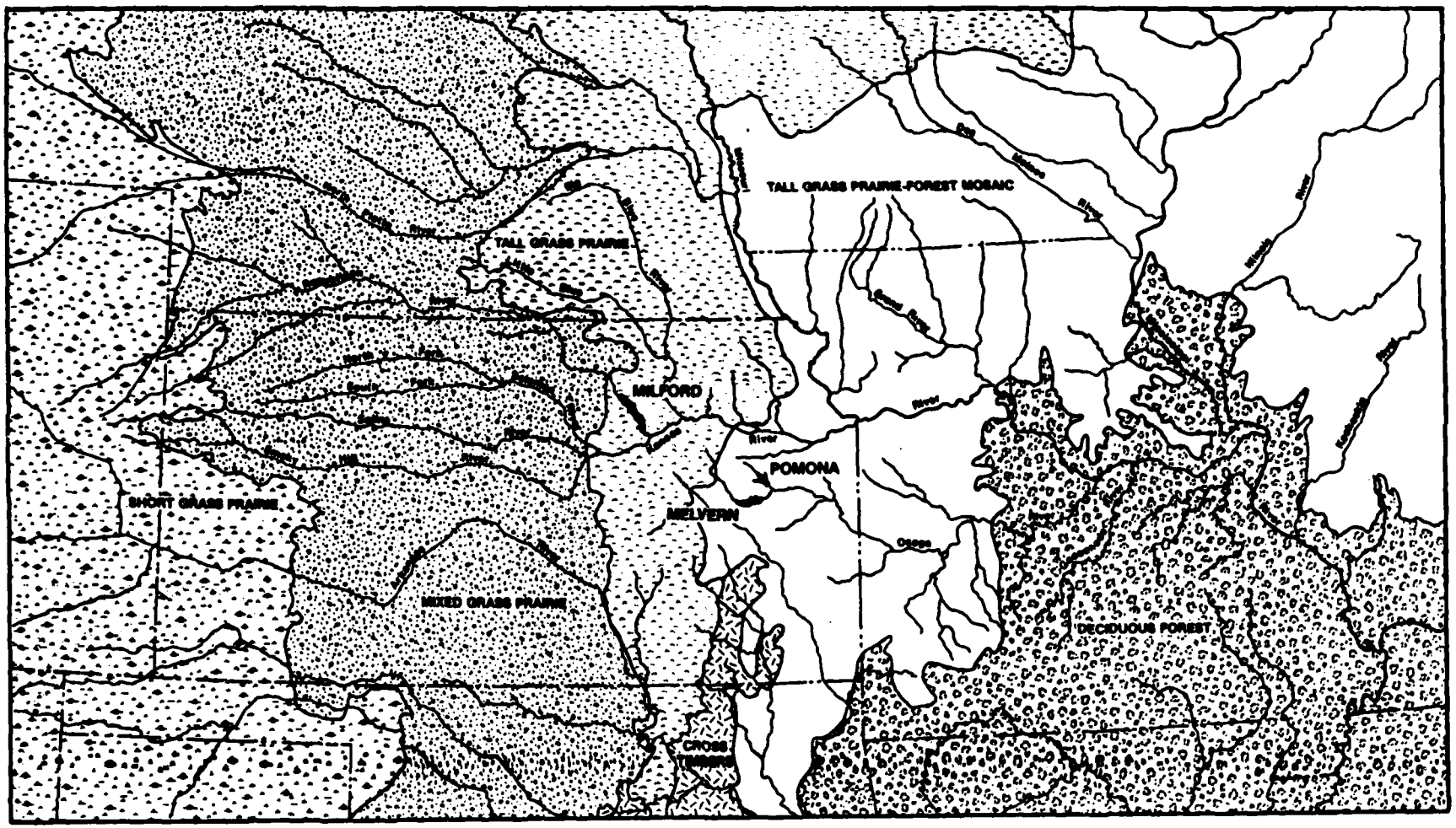



Figure 1. Location of Milford, Melvern and Pomona Lakes within major Midwestern vegetational communities. Vegetational boundaries after Kuchler (1964).

Funding is provided for by the Reservoir Salvage Act of 1960 (Public Law 86-523), as amended by the Archaeological and Historic Preservation Act of 1974 (Public Law 93-291).

According to the Scope-of-work (Appendix I), the cultural resource inventory and investigations at Milford, Melvern and Pomona Lakes were to be structured to provide a determination of (1) the number of archaeological sites present; (2) their area, and temporal extent; (3) their cultural and scientific importance; (4) their eligibility for the National Register of Historic Places; (5) appropriate mitigative methods for eligible sites; (6) a terrace sequence and a predictive model for buried sites. The initial 1982 investigations consisted of intensive survey and testing of 25 percent (approximately 4178 ac) of the Licensed Lands and Refuge areas at Milford Lake; the shoreline (approximately 2430 ac) and 25 percent (450 ac) of four public use areas at Melvern Lake; and the shoreline (approximately 1980 ac) at Pomona Lake.

The draft report on the initial 1982 investigations, which was submitted to the Kansas City District, U. S. Army Corps of Engineers in 1983, contained recommendations for further survey and evaluation of cultural resources at these lakes. Specific recommendations included additional survey and testing at Milford. Results of the 1982 inventory indicated that sites located in agricultural lands were being impacted by agricultural practices and it was recommended that leased agricultural fields be given a high priority for survey. It was proposed that the project area be divided into a series of study units based on tributary drainage of the Upper Republican River and that future inventory proceed on a unit by unit basis (Schmits et al. 1983). The 1982 inventory indicated that potentially significant cultural resources were being impacted in the upper reaches of Melvern Lake by flooding, river meandering and unauthorized artifact collecting.

Concurrent with the review of the 1983 draft report on this work at Milford, Melvern and Pomona Lakes, the Kansas City District was considering plans for a draw-down at Pomona Lake for purposes of dam maintenance. This draw-down provided an ideal opportunity to investigate exposed areas of shoreline adjacent to a number of sites located along the shoreline in 1982. Consequently, in 1983 the Kansas City District requested that ESA conduct additional archaeological inventory and evaluation at the Milford, Melvern and Pomona Lake areas. This work was conducted under terms of a modification to contract DACW1-81-C-0149. The additional scope-of-service (APPENDIX I) consisted of the inventory and evaluation of an additional 575 ac at Milford, the testing of six sites (140S17, 140S362, 14LY414 and an unrecorded site at Melvern and 140S105 and 140S350 at Pomona) along with limited testing at five sites at Pomona (140S106, 140S108, 140S109, 140S111 and 140S367).

140S17 was known to consist of a lithic scatter located north of the confluence of Duck Creek and the Marais des Cygnes River in lands leased to the Kansas Fish and Game Commission. Small side-notched points from the site suggested the possible presence of an early Plains Archaic component (Wright 1982). The unrecorded site consists of a light lithic scatter west of 140S17, which has been designated as Locality II of 140S17. Artifacts recovered from the site were similar

to those recovered from other Late Archaic sites in Kansas suggesting a date of ca. 5000 years B.P. for this locality. 140S362 is a large previously recorded upland site located outside the 1982 survey area at Melvern. 14LY414 is a large Plains Village Pomona Focus site also located in lands leased to the Kansas Fish and Game Commission at Melvern. The site was known to have been partially destroyed by flooding in the spring of 1983. Testing at the three sites at Melvern was to be focused on determining if significant deposits were still present at the sites.

Sites to be tested at Pomona Lake in 1984 included 140S105 and 140S350. The 1982 investigations at Pomona Lake indicated that 140S105 is a partially destroyed Pomona focus site (Donohue 1983). The proposed draw-down offered an opportunity to examine exposed and potentially undisturbed portions of the site. Previously recorded site 140S350 had not been relocated during the 1982 survey. The proposed draw-down provided ideal conditions for investigations of this site. Limited testing was also to be conducted at five sites located along the Pomona Lake shoreline (140S106, 140S108, 140S109, 140S111 and 140S367). This work was to entail documentation of the spatial limits of these sites on the newly exposed terraces and evaluation of the effects of inundation on the sites.

The proposed survey at Milford was to include 575 ac of project lands liscensed to the Kansas Fish and Game Commission in three areas. T11S, R4E, Sections 23, 24, 25 and 26 is in the Curtis Creek area. Most of the unsurveyed terrain there consists of upland terrain overlooking Curtis Creek. T10S, R4E, Sections 16, 18, 19 and 21 is in the Quimby Creek area, and principally consists of upland and floodplain terrain. T9S, R4E Section 27, is in the Timber Creek areas and consists of a combination of lowland T-0, T-1 terrace and upland terrain. A large number of previously located sites are p·esent in the Curtis, Quimby and Timber Creek areas. Additional survey in these areas was expected to locate a high number of sites.

According to the Scope-of-work the additional survey and testing work performed under the modification was to be presented as an addendum to the 1983 draft report. Subsequent discussions between ESA and Corps personnel indicated the advisability of incorporating the 1984 work along with the 1982-1983 work into one comprehensive document covering the work at the three lake areas. The following report presents the results of the combined 1982-1984 investigation at Milford, Melvern and Pomona Lakes. In the following section, the environmental settings of the project areas are presented. The third section contains a summary of eastern Kansas archaeology. Section IV provides the results of the geomorphological terrain analysis. Following the geomorphological study is a review of previous cultural resources investigations at the lakes with a compendium of known cultural resource properties and other results derived from the background study. The research design developed for the project is detailed in Section VI. Sections VII, VIII and IX detail the survey areas and the sites located during the three lakes testing program. The final section (Section X) summarizes the results of the project, discusses the culture history and settlement-

subsistence patterns and develops a predictive model for archaeological site location in the three lakes areas. It also discusses further recommendations for future management of cultural resources at the Milford, Melvern and Pomona Lake projects.

# II. THE ENVIRONMENTAL SETTING OF THE MILFORD, MELVERN AND POMONA LAKE AREAS

Rolfe Mandel and Ralph E. Brooks

## PHYSIOGRAPHY

Milford Lake is located in the Flint Hills region of eastern Kansas. This region is a physiographic subprovince of the Central Lowlands. The Flint Hills are underlain by chert-bearing limestones and shales of Permian age. Surface features and geological structures of the Flint Hills are similar to those in the neighboring Osage Cuestas on the east, but the two subprovinces are separated by a prominent rocky escarpment several hundred feet high (Self 1978:44). The east-facing slope of the escarpment is composed of resistant limestone with intervening softer shale layers. Differential erosion of the limestone and shale layers has formed steplike benches which rise above the lowlands. The tributary valleys are narrow and deep where streams have dissected the resistant limestone formations. Where the streams have cut into the softer shales, the valleys are wider and the slopes are more gentle.

The surface of the Flint Hills Upland is gently rolling, especially toward the western border of the region. Elevations are as great as 1500 ft in some areas, though local relief rarely exceeds 400 ft. The Flint Hills region derives its name from the abundance of flint found scattered over the upland surfaces. The limestone is resistant to weathering, and the nearly insoluble chert is even more so. Thus, as the shale, and eventually the limestone, weather, chert nodules are left as rocky fragments on the surface. This chert was an important raw material used for the production of flint tools by prehistoric and historic aboriginal inhabitants.

Melvern and Pomona Lakes are located in the Osage Cuestas of the Central Lowlands. The Osage Cuestas is a large area lying south of the Kansas River, east of the Flint Hills, and northwest of the Fort Scott limestone that marks the border of the Cherokee Plain (Self 1978:43). This physiographic subprovince is characterized by a series of northeast-southwest trending cuestas. The bedrock in this area consists of a series of hard and soft layers of limestone and shale of Pennsylvanian age that dip to the west (Wilson 1984:4). The cuestas are formed by the differential erosion of these alternating hard and soft rock layers. The more resistant limestone strata form the east-facing upland scarp of each cuesta, while the thicker and softer shales erode more readily and form the intervening lowlands (Self 1978:43). Local relief ranges from fifty to more than 200 ft from the lowland floor to the crests of the escarpments.

## CLIMATE

The climate of the study region, in Thornthwaite's (1948) classification, is moist subhumid (C2). This continental-type climate is characterized by large daily and annual variations in temperature.

The study region lies in the zone of the prevailing westerlies. Cyclonic frontal cells associated with invading Pacific air masses are largely responsible for the short-term (daily and weekly) changes that affect the weather. The weather patterns are basically those described by Borchert (1950:29) for his Climatic Region IV, the wedge-shaped midcontinent area of tall grass prairies, often called the Prairie Peninsula. The major characteristics for the region are:

1) low winter rainfall and snowfall;
2) Occasional major summer droughts with a tendency for major summer droughts to occur synchronously within the region; and
3) a continental source and trajectory of the mean airstream which blankets the region during dry periods.

The Gulf of Mexico is the principal source of moisture for precipitation in Kansas. Because the flow of moist air from the Gulf is more frequent over the eastern part of Kansas than over the western part, the mean annual precipitation decreases about 2.5 cm for each 30 km of distance from east to west. Consequently, the mean annual rainfall in the area of Melvern and Pomona Reservoirs is greater than it is in the area of Milford Reservoir. Table 1 provides data on precipitation for the area of Melvern and Pomona Reservoirs as recorded at Osage City, Kansas. The mean annual precipitation for a 25 year period (1951-1976) is 90.2 cm (35.5 in). Of this, 64.3 cm (25.3 in), or 71 percent, usually falls in April through September.

Precipitation data for the Milford study area are presented in Table 2. The mean annual rainfall for a 96 year period (1859-1955) at Manhattan, Kansas is 81.4 cm (32.0 in). Approximately 79 percent of this precipitation falls in May through September.

As Tables 1 and 2 show, most of the precipitation in the study region occurs during the spring and summer. This period of high precipitation is largely a result of frontal activity. Maritime polar (mP) and continental polar (cP) air masses that flow into eastern Kansas during the late spring and early summer usually converge with warm, moist maritime tropical (mT) air that is flowing north from the Gulf of Mexico. The overrunning of mP and cP air by warmer mT air often produces intense rainfalls of short duration along the zone of convergence. Convectional thunderstorms in the late summer months also produce heavy rainfall.

Winter is a relatively dry period in eastern Kansas. Snowfall is greatest in January and Febuary, with monthly averages exceeding 10 cm (4.0 in). The weather pattern for eastern Kansas produces frequent

droughts. The failure of the winter westerlies to subside results in long periods without rain during summer months.

Mean annual temperatures decrease from southeast to northwest across the study region. The mean annual temperature for a 25 year record (1951-1976) at Osage City, Kansas is 13.0°C. (55.5° F.). This is compared to a mean annual temperature of 12.9° C. (55.3° F.) at Manhattan, Kansas (Table 2). Descriptive summaries for the weather station at Osage City show January to be the coldest month, with a 25 year average of -1.5° C. (29.3° F.), and July to be the warmest month, with a 25 year average of 26.1° C. (78.9° F.) (Table 1). Climatic data for the weather station at Manhattan show a similar pattern, with January and July as the coldest and warmest months, respectively (Table 2).

Table 1. Temperature and precipitation at Osage City, Kansas.*

| MONTH | TEMPERATURE (mean) | | RAINFALL (mean) | | SNOWFALL (mean) | |
|---|---|---|---|---|---|---|
| | °F. | °C. | in | cm | in | cm |
| December | 33.7 | .94 | 1.30 | 3.30 | 3.8 | 9.65 |
| January | 29.3 | -1.50 | .92 | 2.34 | 6.2 | 15.75 |
| February | 34.8 | 1.55 | 1.12 | 2.84 | 4.3 | 10.92 |
| Winter | 32.6 | .33 | 3.34 | 8.48 | 14.3 | 36.32 |
| March | 43.1 | 6.17 | 2.34 | 5.94 | 3.8 | 9.65 |
| April | 56.0 | 13.33 | 3.23 | 8.20 | 0.7 | 1.78 |
| May | 65.8 | 18.77 | 4.46 | 11.33 | 0 | 0 |
| Spring | 55.0 | 12.78 | 10.03 | 2547 | 4.5 | 11.43 |
| June | 74.2 | 5.67 | 4.96 | 12.60 | 0 | 0 |
| July | 78.9 | 26.05 | 4.50 | 11.43 | 0 | 0 |
| August | 77.3 | 25.16 | 3.92 | 9.96 | 0 | 0 |
| Summer | 76.8 | 24.89 | 13.38 | 33.99 | 0 | 0 |
| September | 69.1 | 20.61 | 4.23 | 10.74 | 0 | 0 |
| October | 58.9 | 14.94 | 2.89 | 7.34 | 0 | 0 |
| November | 44.3 | 6.83 | 1.65 | 4.19 | 1.2 | 3.05 |
| Fall | 57.4 | 14.11 | 8.77 | 22.27 | 1.2 | 3.05 |
| Year | 55.5 | 13.06 | 35.52 | 90.22 | 20.0 | 50.80 |

* Based on a 25 year record: 1951-1976

Source: H. Dickey. Soil Survey of Osage County, Kansas. U.S. Department of Agriculture, Soil Conservation Service, U. S. Government Printing Office, Washington D. C. (in press).

Table 2. Temperature and precipitation at Manhattan, Kansas.*

| MONTH | TEMPERATURE (mean) | | RAINFALL (mean) | | SNOWFALL (mean) | |
|---|---|---|---|---|---|---|
| | °F. | °C. | in | cm | in | cm |
| December | 32.2 | .11 | .86 | 2.18 | 3.5 | 8.89 |
| January | 29.2 | -1.55 | .71 | 1.80 | 4.0 | 10.16 |
| Febuary | 32.4 | .22 | 1.22 | 3.09 | 4.6 | 11.68 |
| Winter | 31.3 | -.38 | 2.79 | 7.08 | 12.1 | 30.73 |
| March | 44.0 | 6.66 | 2.84 | 7.21 | 4.0 | 10.16 |
| April | 55.2 | 12.88 | 2.66 | 6.75 | 1.1 | 2.79 |
| May | 64.8 | 18.22 | 4.43 | 11.25 | trace | trace |
| Spring | 54.7 | 12.22 | 8.71 | 22.12 | 5.1 | 12.95 |
| June | 74.7 | 23.72 | 9.04 | 22.96 | 0 | 0 |
| July | 80.2 | 26.77 | 3.73 | 9.47 | 0 | 0 |
| August | 78.5 | 25.83 | 4.24 | 10.77 | 0 | 0 |
| Summer | 77.8 | 25.44 | 12.58 | 31.95 | 0 | 0 |
| September | 70.5 | 21.38 | 3.93 | 9.98 | 0 | 0 |
| October | 58.1 | 14.50 | 2.25 | 5.72 | .2 | .51 |
| November | 44.0 | 6.66 | 1.77 | 4.50 | .9 | 2.29 |
| Fall | 57.5 | 14.16 | 7.95 | 20.19 | 1.1 | 2.79 |
| Year | 55.3 | 12.94 | 32.03 | 81.36 | 18.3 | 46.48 |

* Based on a 96 year record: 1859-1955

Source: O.W. Bidwell, 1960. Soil Survey of Geary County, Kansas. U.S. Department of Agriculture, Soil Conservation Service, U.S. Government Printing Office, Washington, D.C.

## VEGETATION

The native vegetation in the Melvern, Milford, and Pomona Lakes region is predominately Tall Grass Prairie or Bluestem Prairie (Kuchler 1964, 1967). The Tall Grass Prairie is one of several north-south running bands of distinct grassland associations recognized as composing the region variously referred to as the Great Plains, Prairie and Plains, or Central or Interior Grasslands (Figure 1).

Incredibly, the Interior Grasslands was once thought of as a vast, homogeneous grassland. Today we recognize that the increase in elevation and decrease in rainfall from east to west combine to have a

profound affect on the composition and overall appearance of each association, as will be discussed and compared with regard to the Tall Grass Prairie. The western limit of the Interior Grasslands is distinctly bounded by the Rocky Mountains. Abutting the mountains is the Short Grass Prairie which slopes gently eastward on the High Plains (Figure 1). At the eastern edge of the High Plains in western Kansas, the Short Grass Prairie is gradually replaced by the Mixed Grass Prairie which extends to the ill-defined western boundary of the Flint Hills. There, the Tall Grass Prairie begins and extends eastward to its boundary with the Eastern Deciduous Forest. While the distinction between the Tall Grass Prairie and the Eastern Deciduous Forest is obvious, their absolute boundary is far less so with the Dissected Till Plains and Osage Cuesta Plains of eastern Kansas and western Missouri situated in a mosaic of Tall Grass Prairie and Deciduous Forest. Eventually, however, the land gives way, more quickly to the southeast than the east, to vast expanses of deciduous forest (Figure 1).

## Tall Grass Prairie

In summer the Tall Grass Prairie in pristine condition is a region with dense stands of medium tall to tall (head high or more) waving grasses and a less significant number of shorter grass species. Varicolored forbs abound, ranging in height from low to tall and producing strong seasonal aspects. The dominance of tall grasses, paucity of shrubs, and the absence of trees except along waterways and associated bluffs are all distinguishing features of the Tall Grass Prairie.

The region is dominated by warm season grasses, with the most important being big bluestem (Andropogon gerardii), little bluestem (Andropogon scoparius), switchgrass (Panicum virgatum), and indian grass (Sorghastrum nutans). Less significant yet normally evident are a number of grasses which become a more important component of the Mixed Grass Prairie to the west including sideoats grama (Boutelous curtipendula), June grass (Koeleria pyramidata), and sand dropseed (Sporobolus asper).

Numerous annual and perennial herbs are characteristic in the Tall Grass Prairie, although they account for less than 5 percent of the prairie community. These for the most part display a distinct bimodal flowering sequence, i.e. one set flowers in the spring and a second set flowers in the late summer. By late April, the prairies of eastern Kansas have become green and are alive with color from the numerous herbs. These early season species, such as groundsel (Senecio plattensis), pusseytoes (Antennaria neglecta), and pale poppy mallow (Callirhoe alcaeoides), are generally small plants that appear and disappear in a few short weeks before the grasses begin to produce much vegetative growth. The fruits of most of these early season species are not often utilized but several species flowering at this time can be collected in order to use vegetative parts. Perhaps the best known of these is the common breadroot (Psoralea esculenta).

Through the mid-summer there is a distinct decrease in the number of plants blooming while at the same time the dominant grasses continue to grow vegatively and the warm season herbs begin to initiate substantial growth. By mid-August the warm season grasses and herbaceous plants have bolted and many begin to flower. Most evident in the Tall Grass Prairie are the goldenrods (Solidago canadensis, S. rigidus, and S. missouriensis), blazing stars (Liatris aspera and L. mucronata), round head lespedeza (Lespedeza capitata), and the sunflowers (Helianthus grosseserratus and H. solicifolius). Finally by mid and late September, the asters (Aster pilosus, A. ericoides, A. simplex, and A. oblongifolius) appear on the prairies signalling that the growing season is nearing its end.

The waterways in the Tall Grass Prairie are generally small with limited open floodplains. The open sites that may be periodically flooded, especially in the spring, are execllent sites for wetland communities, which primarily grow and produce fruit from mid-summer into the fall. In broad valleys the tall grasses do well as long as they are not subjected to standing water for any length of time. Mud flats, however, are the preferred sites for plants such as smartweeds (Polygonum pennsylvanicum, P. hydropiperoides, P. punctatum, and P. lapathifolium), docks (Rumex crispus and R. altissimus), purslane (Portulaca oleracea and P. mundula) and chenopods (Chenopodium ssp.).

The hillsides along the waterways, if wooded, are generally dominated by bur oak (Quercus macrocarpa) with scattered individuals of bitternut hickory (Carya cordiformis) and shagbark hickory (C. ovata). Black walnut (Jugians nigra), green ash (Fraxinus pennsylvanica), and sycamore (Platanus occidentalis) prevail in the lower, more mesic sites. The understory is mostly buckbrush (Symphoricarpos orbiculatus) and Missouri gooseberry (Ribes missouriense) and the herbaceous flora, while reminiscent of that found in the forests to the east, is depauperate.

In summary, the Tall Grass Prairie is primarily dominated by four grasses, yet its moderate rainfall (31-42 inches annually), long growing season (180-200 days), and rich soils provide conditions suitable for the growth of numerous other grasses and herbs. The total flora of the region includes approximately 700 species, considerably higher than western sections of the Interior Grasslands and slightly less than more eastern areas.

## Mixed Grass and Short Grass Prairie

The transition from the Tall Grass region westward to the Mixed Grass Prairie is subtle and frequently not easily perceived. The total species count for the region drops to about 500 species. The prairies here are dominated by a combination of species found in the Tall Grass and Short Grass prairies with the most important being big bluestem, little bluestem, sideoats grama, and blue grama (Bouteloub gracilis). The ground cover is not as dense as in the Tall Grass Prairie and in fact is often broken. The nongrass species are obviously fewer in number and generally smaller in stature. These reductions are primarily caused by decreased rainfall (20-30 inches annually) and an increase in

mean annual water loss (90-95% annually). Even along the water courses, it is quite evident that fewer plant species are present. Herbs are rare in the understory of cottonwoods (Populus deltoides), cedars (Juniperus virginiana) or scattered bur oaks that may be present.

By the time one enters the Short Grass Prairie on the High Plains, forested areas are nearly nonexistant except along a few seepy canyons or in scattered groves along large rivers, such as the Republican. The Short Grass Prairie is characterized by a small flora of about 350-400 species dominated by short grasses including buffalo grass (Buchloe dactyloides) and blue grama. Holdovers, such as big and little bluestem, sideoats grama, and indian grass are still encountered but in small numbers and they are generally smaller in size. The remainder of the flora in the Short Grass Prairie is heavily influenced by the Sonoran and Cordilleran areas to the west giving the prairie a flora distinctly different in species composition as well as species numbers. For example, the common milkweed of the Tall Grass Prairie is Asclepias syriaca, while in the Short Grass Prairie it shifts to the similar Asclepias speciosa. In the smartweeds, Polygonum pennsylvanicum is present in the east and Polygonum bicorne in the west. With both of these examples, the eastern and western species may each occur in the Mixed Grass Prairie.

Unlike the strong bimodal flowering sequence evident in the Tall Grass Prairie, the sequence swings substantially toward the spring in the Short Grass Prairie. The herbs are much smaller and frequently visible for a shorter span of time. To move westward from the Tall Grass Prairie is to gradually go from a moderately mesic land with an abundant and varied flora to a harsh, xeric region with a limited flora.

## The Tall Grass Prairie-Forest Mosaic

Eastward from the Tall Grass Prairie a band of irregular width is encountered where the land is a mosaic of Tall Grass Prairie and Eastern Forest (Figure 1). In Kansas the mosaic extends more than 100 miles to the west while to the southeast the forests are encountered much sooner because of the Chautauqua Hills in southeastern Kansas and the Ozark Region in central and southern Missouri.

The primary floristic components of the prairies and forests in the mosaic are as found in the Tall Grass Prairie and Eastern Forest, respectively. The uniquenesss of the area is, however, realized when one considers the total number of species that are present in the region: the prairie species plus the forest species. Species lists from the Prairie-Forest Mosaic could easily top 900-1000 different plants. In addition, the ecotones between the prairie and forest provide an additional habitat for such plants as the Jerusalem artichoke (Helianthus tuberosus), blackberry (Rubus sp.), and several sumacs (Rhus glabra and R. copallina).

## The Eastern Deciduous Forest

The Eastern Dedicuous Forest stretches over a good deal of the eastern United States and southern Canada. It is limited on the north by too few frost-free days, on the west at about the Kansas-Missouri border by aridity, and on the south by sharp changes in soil conditions where it meets the Coastal Plain. The forest reaches its most favorable and diverse condition in the Appalachian Mountains, with the diversity of plant species decreasing as one moves outward. The area adjacent to the Interior Grasslands is, however, still a complex community of many plant species.

The trees in the forested areas of eastern Kansas and Missouri form an almost complete crown cover, allowing little sunlight to reach the ground in summer. The canopy is dominated by bitternut and shagbark hickory, white oak (Quercus alba), black oak (Q. velutina), and northern red oak (Q. borealis). Secondary canopy elements abound, including such species as basswood (Tilia americana), sugar maple (Acer saccharum), and several additional oaks and hickories.

The understory is well developed yet usually not congested, making a walk through the forest pleasant in most cases. Common small trees encountered are redbud (Cercis canadensis), hornbeam (Ostrya virginiana), and bladderpod (Staphylea trifoliata). Shrubs may include Missouri gooseberry, paw paw (Asimina triloba), and hazelnut (Corylus americana), to name a few.

The appearance of the forest floor varies with the season. In the spring before the trees have leaves, flowering herbs are abundant and colorful: Jack-in-the-pulpit (Arisima triphyllum), bloodroot (Sanguinaria canadensis) and may apple (Podophyllum peltatum), for example. These spring beauties fruit and then disappear to be followed by a less spectacular, slower succession of other plants blooming later in the season. As in the Tall Grass Prairie, the major flowering periods are skewed toward the spring and fall. From midsummer until fall the most conspicuous and abundant flowers in the forest are members of the Aster family, with asters (Aster spp.) and goldenrods (Solidago ssp.) being especially common. Less obvious are plants such as the Virginia smartweed (Polygonum virginianum), the ragweeds (Ambrosia ssp.), and some of the chenopods (e.g., Chenopodium hybridum). Grasses are uncommon in the forest except in clearings with most of the grasslike tufts observed being various sedges (Carex ssp.).

Bottomlands along streams are usually forested but the species composition differs from the uplands. Here the canopy species include the rapidly growing invaders like cottonwood, green ash, willows (Salix ssp.) and silver maple (Acer saccharinum). Periodic flooding keeps most of these areas devoid of dense shrub growth and depending on how often flooding occurs, ground cover may be minimal early in the season. Later, as the rains cease, large stands of nettle (Utrica dioica) or ragweed (Ambrosia trifida) are commonplace. Mid and late season are also the times when annual smartweeds, amaranths, and chenopods invade more open sites that may have been covered by standing water earlier in the season.

# III. CULTURAL OVERVIEW OF EASTERN KANSAS

Larry J. Schmits

Archaeological investigations in eastern Kansas during the past three decades have produced a substantial body of data documenting successive cultural adaptations within the prairie Plains environment. Most of this information has resulted from federally funded lake construction projects and has been administered by the U.S. Army Corps of Engineers and the National Park Service. Based on typological changes, radiocarbon dates and subsistence strategies, the cultural history of eastern Kansas can be divided into six broad cultural-historical periods: Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Protohistoric and Historic. This sequence and terminology is largely in agreement with that recently used by Wedel (1964, 1978), Caldwell and Henning (1978) and Johnson and Wood (1980).

More recently, the Kansas Antiquities Commission has organized the archaeology of the state into a similar six stage sequence utilizing the terms Early Ceramic, Middle Ceramic and Late Ceramic in lieu of Plains Woodland, Plains Village and Protohistoric. This terminology, derived from Champe (1946), is designed to avoid the ambiguities arising from the dual use of terms such as Plains Woodland and Plains Village which denote both cultural traditions as well as sequential periods. While this scheme has seen considerable usage in Kansas, it is generally unfamiliar to archaeologists in adjacent areas of the Plains. In order to address the largest possible audience and since most workers in the state recognize the interchangeability of these terms, we have retained the more traditional terminology. In order to avoid any possible confusion, the Kansas Antiquity Commission equivalents to these terms have been listed in parentheses.

Paleo-Indian (15,000-7000 B.C.): While occupation of North America prior to the Paleo-Indian period has often been proposed (Krieger 1964), no sites of pre-Paleo-Indian age are known for Kansas. Furthermore, no well studied Paleo-Indian sites are known from Kansas, although such sites have been studied in surrounding states, and Paleo-Indian fluted Clovis points have been found on the surface in many areas of Kansas (Wedel 1959). Williston (1902, 1905) reported a bison kill site in western Kansas. While this site was not well studied at the time of its discovery, it has recently been dated at 10,435-10,245 B.P. (Rodgers and Martin 1979). While well documented evidence is still lacking, there is little doubt that Paleo-Indian populations lived in Kansas during the terminal Pleistocene. Since we know so little about this period in Kansas, any discovered sites dating to this period would provide significant data. It is probable that most sites dating to this period are buried in Pleistocene terrace remnants or consist of thin lithic scatters located in upland areas.

Plains Archaic (7000 B.C.-100 A.D.): For many years the only thing known about hunter-gatherer adaptations of the Archaic period in the Central Plains had been based on information from sites such as Allen, Simonsen and Logan Creek in Nebraska and Iowa. More recently, investigations at the Sutter site in northeast Kansas (Katz 1971), at the Snyder site in the El Dorado Lake area (Grosser 1973, 1977), at the Coffey site in the Tuttle Creek Lake area,(Schmits 1978, 1980a) and at the Williamson site in the John Redmond Reservoir area (Schmits 1980b) have provided considerable information for the Archaic period in eastern Kansas. Elsewhere in North America, the Archaic has commonly been divided into Early, Middle and Late (Frison 1978, Chapman 1975) subperiods. Information in eastern Kansas is at present too sketchy to formally divide the Archaic into this tripartite subdivsion. In general there is a paucity of sites for the first half of the Archaic. Limited investigations at the Sutter site have produced dates from 7500-8000 years B.P. Artifacts from the site include chert flakes, sandstone grinding tools and general lanceolate and stemmed points, while faunal remains are predominantly bison (Katz 1971). A second early Archaic occupation is present in Unit II at the Coffey Site (Schmits 1980a). No diagnostic artifacts are associated with the component.

For the later half of the Archaic period more substantial evidence is available. Excavations in Unit III at the Coffey site (Schmits 1978, 1981) have produced a stratified series of Late Archaic living floors dating from 5200-5000 years B.P. These cultural levels are deeply buried in channel fill deposits and represent late summer and fall extractive camps located on mudflats along the shores of an oxbow lake (Schmits 1980a). Diagnostic artifacts from the Unit III cultural levels include broad notched and stemmed points, Clear Fork Gouges and Munkers Creek Knives. A second site (De Shazer Creek) with similar artifacts has been located in Marshall County, Kansas. Dates at this site range from 4215±180 to 5320±790 years B.P. (Schmits 1981).

The Archaic cultural sequence succeeding Unit III at Coffey and De Shazer Creek has been identified largely on the basis of Grosser's (1973, 1977) work at the Snyder site. This extremely important site contains the longest and most complete sequence of Archaic deposits in eastern Kansas. The radiocarbon dates from the base of the Chelsea phase component at Snyder range from 4650-4800 years B.P. Points from this component are broad, triangular, short forms with corner notches. The Chelsea phase at Snyder is succeeded by the El Dorado phase which has been dated at 3200 years B.P. Points associated with the El Dorado phase include side-notched, corner-notched and stemmed forms with straight to concave bases. El Dorado phase components have also been located at Coffey (Schmits 1980a) and at Williamson (Schmits 1980b). The El Dorado phase at Snyder is succeeded by the Walnut phase. This complex is characterized by triangular corner-notched projectile points and has been dated at 2060-1970 years B.P. A second series of Walnut phase cultural deposits have been located in Unit IV at Locality II of Coffey. Radiocarbon dates from these deposits range from 2320-2400

years B. P. (Schmits 1980a). The preceding four stage late Archaic sequence spans a 3000 year interval covering the last half of the Archaic period. Overall, this sequence is characterized by notched and stemmed, rather than lanceolate, projectile point forms. Subsistence activities for these phases appear to be similar, in general consisting of a foraging adaptation to floodplain biotic communities. Settlement patterns are concentrated on the floodplain of small to medium-size river valleys.

Plains Woodland (Early Ceramic) (A.D.100-A.D. 1000): The Woodland period in eastern Kansas is characterized by greater restriction of hunting and gathering ranges and increasing dependence upon the use of tropical cultigens. Two major traditions have been recognized for eastern Kansas during the Woodland period: the Hopewell and Plains Woodland (Johnson, In Press; Reynolds 1979). Hopewellian components are identified by the similarity of their artifact styles and subsistence practices to well defined sites in Illinois and central Missouri (Wedel 1943; Johnson 1976). Hopewell sites appear to be concentrated in the far eastern (Johnson, In Press) and southern (Marshall 1972) areas of Kansas, with Plains Woodland sites located mainly in the central and northern areas (Reynolds 1979; Johnson, In Press). There is considerable spatial overlap, however, between Plains Woodland components found near Kansas City and Hopewellian components located near Topeka.

A number of Plains Woodland phases have been defined in eastern Kansas including the Grasshopper Falls phase, the Greenwood phase and the Cuesta phase (Reynolds 1979). The Grasshopper Falls phase is principally known from the Mahn, Anderson and Teaford sites located along the Delaware River in northeastern Kansas (Reynolds 1979). Habitational structures consist of oval pole dwellings covered by matted twigs and grass. Small amounts of daub indicate that some mud plastering occurred. Small, shallow basin pits are generally associated with the occupations. Grasshopper Falls ware ceramics are predominantly cordmarked or smoothed grit tempered jars with conical bases. Rims are plain and often constricted. Projectile points are medium to large corner-notched with expanding stem styles. Contracting stemmed dart points as well as small Scallorn arrow points are also present. The settlement patterns consisted of small isolated clusters of households on terraces adjacent to secondary drainages. Subsistence was primarily focused on hunting and gathering with horticulture of minimal importance (Reynolds 1979:65-75).

Greenwood phase Woodland sites are located in east central Kansas and are characterized by cordmarked, limestone tempered ceramics. The limited information available on habitational structures indicates that oval or round, daub covered houses were present. Greenwood phase sites have recently been documented in the John Redmond Reservoir area and include the Gilligan (Jones and Witty 1980) and Salb sites (Schmits 1980c).

Cuesta phase components have been recognized along the Elk River and Big Hill Creek in southeastern Kansas. Diagnostic traits of this phase include large oval to circular postmold patterns with widely

spaced individual posts. Interior house features include pits and hearths. Ceramics include plain and decorated vessels with dentate, punctate and stick impression. The principal Cuesta phase site investigated by Marshall (1972) in the Elk City Lake area was the Infinity site. At least five large habitational structures, indicating the presence of a nucleated village, were present at the site. Features from the site include a midden, dog and human burials and pits. Radiocarbon dates from the Cuesta phase component at Infinity are A.D. 780±80 and A.D. 970±80.

Additional Cuesta phase components have been located in the Big Hill Lakes area (Brogan 1981). Site 14LT304 contained evidence of two widely separated houses. No midden or burials were found. Artifacts included expanding and contracting stemmed dart points, Scallorn arrow points and Cuesta ware ceramics. A house, evidence of a midden, and ceramics and lithics indicative of a Cuesta phase occupation were found at 14LT316. Based on an analysis of Cuesta phase settlement patterns, Brogan (1981) recognizes two contrastive settlement types: the large nucleated village located along major drainages, as exemplified by the Infinity site, and smaller isolated households or hamlets found on secondary streams. Site catchment analysis along with floral and faunal analysis indicate that Cuesta phase subsistence was focused on riverine oak-hickory forest. Brogan suggests that the two settlement types may result from the differential carrying capacity of major versus tributary streams.

While Plains Woodland sites have been investigated and a number of cultural units are presently recognized, the spatial and temporal relationships between these complexes are poorly known. Relatively few radiocarbon dates are available and almost no information regarding subsistence and lithic procurement patterns is available. The social relationships, including ethnic boundaries between the various Plains Woodland groups and between Plains Woodland and Hopewellian social groups in eastern Kansas, need to be examined in detail.

Plains Village (Middle Ceramic) (A.D. 1000-A.D. 1500): During the Plains Village period, village sedentism and reliance on agriculture became established, as evidenced by the presence of larger sites, denser debris scatters and more complex artifact assemblages. Several social units referred to as variants within the Plains Village Tradition are present in the eastern half of Kansas. These variants, generally referred to as aspects, have recently been termed as phases by Caldwell and Henning (1978), including the Upper Republican, the Smoky Hill and the Nebraska aspects (phases). Plains Village sites east of the Flint Hills and south of the Kansas River have been included with the Pomona focus (Witty 1978).

Plains Village populations in north central Kansas have primarily been identified as Upper Republican. Upper Republican ceramics are predominantly sand tempered with collared rims and elaborate decoration. Two constituent phases, the Solomon River phase and the Upper Republican phase, have been defined. The Solomon River phase is the earliest dated manifestation of the Central Plains Tradition dating to as early as A.D. 800-850. Some fifteen sites were located and excavated in the Glen

Elder locality. Solomon River phase sites are characterized by rectangular houses with four central support posts and cordmarked globular or subconcoidal vessels with incised decorations. The Solomon River phase has been interpreted as ancestral to both the Smoky Hill phase and the later classic Upper Republican phase in Nebraska (Caldwell and Henning 1978:127).

Smoky Hill components are concentrated in the Smoky Hill, Blue and Kansas River drainages to the north and west of Topeka (Witty 1978). This complex appears to be agriculturally oriented with larger sites, more permanent earthlodge houses, more artifactual debris and a more complex tool assemblage present. Smoky Hill ceramics consist of clay or shale-tempered cordmarked vessels which often have a collared or thickened rim. Important western Smoky Hill sites include the Minneapolis site and the Whiteford burial site near Salina. Eastern Smoky Hill sites include the Griffing site west of Manhattan (Wedel 1959) and the Budenbender site north of Manhattan.

The Nebraska phase has been identified in extreme northeastern Kansas along the Missouri River valley, and is thought to extend over much of northeastern Kansas (Wedel 1959). Recent analysis of Nebraska phase data indicates a close relationship between this culture and the Upper Republican phase. The earliest sites date to A.D. 1000-1300 (Caldwell and Henning 1978).

The Pomona focus appears to represent a continuation of the Plains Woodland Tradition, involving the practice of limited agriculture and having artifactual similarities to other Central Plains Tradition complexes. House form is a strong indicator of this Plains Woodland continuity, consisting of small generally round or oval post and lath structures which were covered with mud and grass. Sites included within the Pomona focus are characterized by small hamlets consisting of light frame, mud and grass-covered structures which often have interior storage pits but generally lack interior hearths. Exterior hearths have been reported from a number of these sites. Ceramics predominantly consist of the sherd tempered, cordmarked Pomona ware. Projectile points include small triangular corner-notched and side-notched arrow points along with larger side-notched dart points (Witty 1967, 1981a). Preservation of organic remains at these sites is poor. However, most of these sites were excavated prior to the development of modern recovery techniques such as flotation and water screening. As a result, the subsistence patterns associated with these sites are not fully known. The limited data available indicate a hunting and gathering economy which was at least minimally supplemented by limited horticulture (Schmits et al. 1980). Important Pomona sites include the Hart site in the Pomona Lake area (Wilmeth 1970) and Wiley and Harsch and Dead Hickory Tree in the John Redmond Reservoir area (Schmits et al. 1980).

Protohistoric (Late Ceramic) (A.D. 1500-A.D. 1700): The Protohistoric period refers to the time between initial contact by Native Americans with Euroamericans and the establishment of permanent Euroamerican settlements. For many parts of the Great Plains, such a definition would extend the Protohistoric into the mid to late

nineteenth century. Therefore, the Protohistoric is usually seen as ending when regular or prolonged contact was established. In eastern Kansas this period is generally viewed as ending in the eighteenth century when licensed French traders began to operate in the area.

Spanish expeditions made the first direct contacts, beginning in 1541 with Coronado's quest for "Quivira". Ancestors of the Wichita, Pawnee, Osage and possibly Kansa Indians lived in eastern and central Kansas at this time. However, we can gather little information from the archaeological data about these peoples. Spanish descriptions contain references to large, agriculturally based, grasslodge villages for southern and central Kansas, probably "proto-Wichita" groups. To the north the Pawnee bands were recorded by the Spanish. Plains Apache groups referred to as the Dismal River aspect were located in western Kansas. It is probable that over much of eastern Kansas the basic Plains Village Tradition lifeways continued into the Protohistoric period.

Historic (A.D. 1700-Present): In the early 1700s, the first Euro-americans penetrated the eastern Kansas area on a regular basis. They recorded Kansa villages in present day Doniphan and Leavenworth counties. During the next 150 years, the Kansa moved west and south, establishing new villages beyond the expanding Euroamerican frontier. The Pawnee (Republican Band) were recorded on the Republican River in the late eighteenth century. The Osage occupied an area in southwestern Missouri along the Osage River (Marais des Cygnes in Kansas) extending back to the Protohistoric period. In eastern Kansas, Pawnee, Osage and Kansa village groups during this period maintained their settlements and agricultural orientation, although a large part of each year was spent in pedestrian and, later, mounted bison hunting in the western and central areas of Kansas (Unrau 1971). In the early and middle 1800s, the U.S. Government relocated several eastern and midwestern Indian groups by assigning them to reservations in eastern Kansas. Most of these groups were moved again in the late 1800s to Oklahoma.

Although Kansas was visited by Spanish, French and English explorers, hunters, trappers and traders during the 1500s, 1600s and 1700s, Euroamerican settlement did not occur until after the Louisiana Purchase of 1803 (Zornow 1957; Andreas 1883). The unfortunate labeling of Kansas as part of the Great American Desert by early U.S. Government explorers attached a stigma to the area that took half a century to remove. Rather than being viewed as a habitable area, most of the Great Plains was seen as inhospitable tract of desolation to be avoided or crossed as quickly as possible.

Kansas was included in the Missouri Territory of the 1800s, and little settlement occurred other than the establishment of religious missions for the reservation Indians. During the first half of the nineteenth century, Kansas was crossed by settlers headed for the Northwest (the Oregon Trail) and the Southwest (the Santa Fe Trail). In the 10 years before the Civil War, eastern Kansas was settled rapidly during competition for control of the Territory between "free" and "slave" groups. Anti- and pro-slavery groups settled in separate towns, carrying out individual and organized acts of terror and violence

against each other. Kansas was admitted to the Union in January, 1861 with Topeka as the state capital. The late 1800s saw periods of rapid settlement and development. Railroads dominated much of this development by opening new areas for settlement by emigrants from the eastern United States and from Europe.

The Republican band of the Pawnee ranged over the Milford Lake area during this time (Wedel 1938). The Bogan site located at Milford Lake is the southernmost known Historic Pawnee site. The site is comprised of three small house pits and a fortification wall. Based on data from Bogan and the Kansas monument site, Roberts (1978:163-177) has concluded that the former was occupied at the close of the eighteenth century while the latter was used ca. 1775. In part, the lack of sites can be attributed to the Pawnee moving away from the Republican to other areas such as the Platte in Nebraska. Nevertheless, additional sites should be present along the river from which the band took its name.

Among the Euroamericans passing through or near the Milford Lake area after Coronado were de Bourgmont in 1724 (Margry 1886:447), Zebulon Pike in 1806, Steven Long in 1819, David Acheson in 1830, and John C. Fremont in 1843. Permanent settlement followed these early explorers in the mid-nineteenth Century. By 1855, the area was populated enough to allow a county to be formed. This county, called Davis, was comprised of both Clay and Geary counties (Blackmar 1912:717).

Osage County, in which Melvern and Pomona lakes are located, experienced much the same pattern of contact and settlement as that which occurred in the Milford Lake area. The earliest known historic inhabitants of the Melvern and Pomona Project areas were the Kansa Indians (Unrau 1971) who included the upper reaches of the Marais des Cygnes River as part of their hunting ground. This territory was ceded to the U.S. in 1825. In the 1840s, approximately 1000 Sac and Fox Indians were moved to a reservation at the headwaters of the Marais des Cygnes River (Aldenderfer 1980). The Sac and Fox were divided into four sociopolitical groups. Three of these made a strong effort to become acculturated into Euroamerican society. The fourth group was more traditional and refused to adopt white cultural patterns. The only identified historic site at Pomona Lake is the Masenthin site, 140S301, a burial attributed to the Sac and Fox (Wilmeth 1970). In the 1860s, the Sac and Fox gave up the reservation to go to the Indian Territory in Oklahoma.

# IV. GEOMORPHOLOGY AND LANDSCAPES OF THE MILFORD, MELVERN AND POMONA LAKE AREAS

Rolfe Mandel and Larry J. Schmits

The survey of Milford, Melvern and Pomona Lakes involved the archaeological inventory of some 9600 ac of land within the three projects. This includes uplands overlooking the Republican and Marais des Cygnes valleys and lowlands along these rivers and their tributaries. Terrain analysis was combined with the archaeological inventory in order to (1) reconstruct landscape evolution in the project areas; and (2) develop a predictive model for locating archaeological sites. Emphasis was placed on identifying terrace sequences in the river valleys, and determining the alluvial chronology based on stratigraphy, soil development, radiometric dating, and archaeological data.

The geomorphological terrain analysis was conducted in two phases. The first was conducted by Paul Kopsick in the Research Design phase of the project, and consisted of preparation of a set of maps at 1:24,000 scale for the three project areas. The maps subdivided the project areas into lowland (T-0), terrace (T-1), older Pleistocene terrace, colluvial side slope, and upland terrain. These maps are based on topographic maps, soil surveys, aerial photos and information from geological reports (Kopsick 1983). The terrace systems, colluvial deposits, and loess found in the project areas were compared to similar landscapes in the East-Central Plains. Based on these comparisons, approximate ages were assigned to the alluvial deposits and to other landforms in the Republican and Marais des Cygnes valleys. For example, aggradation of T-0 sediments was estimated to have occurred between about 2500 years B.P. and the present. The T-1 sediments were estimated to range in age from 12,000 years B.P. near the base of deposits to 3000 years B.P. on the terrace surfaces. Colluvial deposits were estimated to be late Holocene in age, and the loess-covered uplands were generally thought to have surfaces exposed since the end of the Pleistocene.

The terrain maps were used to devise the sampling strategy for the project areas and they were included in the 1983 draft report. The location of sites of different cultural periods shown on these maps presented numerous complications. For example, the four identified Archaic sites at Milford were located on T-0 surfaces, a surface inferred to be too recent to contain these deposits. Plains Woodland sites were equally divided, with eight being present on the mapped T-1 surface and eight on the mapped T-0 surfaces. Much the same distribution was found at Melvern where the only three Archaic sites in the project area were located on terrain mapped as T-0 floodplain. All lowland Plains Woodland and Plains Village sites at Melvern were also located on surfaces mapped as T-0 floodplain. At Pomona, one Archaic site was located on the mapped T-0 floodplain, and one was on the mapped

T-1 terrace. Two Plains Woodland sites were located on the mapped T-0 terrace and one was on the T-1 terrace.

While the results of these tabulations clearly raised questions regarding the certainty of the ages of the alluvial surfaces on the terrain maps, the source of the problem was not at all clear. The cultural affiliation of many of the sites, especially Archaic ones, had been derived from site survey forms and from earlier survey reports. Often the cultural affiliation of sites had been based on minimal data, and many of the sites assigned to Archaic periods could actually be more recent occupations.

It is important to note that the terrain maps were produced without the benefit of radiometric dates. Consequently, the problem of associating sites with alluvial deposits of appropriate age became more acute with the 1984 field work. Testing at two sites located on terrain mapped as T-0 at Melvern Lake, 14OS17 and 14LY414, recovered Plains Archaic materials and associated radiometric dates of 2390 and 6370 years B.P. Clearly, much of the terrain mapped as T-0 floodplain by Kopsick was older than was initially thought.

In an attempt to resolve these discrepancies, the terrain for the three project areas was remapped using U. S. Department of Agriculture Soil Survey soil maps to define the various landforms. Since the three projects contain few radiocarbon dates associated with alluvial sediments, the growing body of literature concerning the alluvial history of the Plains and Midwest was also examined more closely to extrapolate chronologies for the terrace sequences at the three lake areas. The following discussion presents the results of this work and briefly describes how the present terrain analyses and alluvial chronologies differ from the initial work done by Kopsick (1983).

## MILFORD LAKE

Milford Lake is located in southeastern Clay, southwestern Riley, northeastern Dickinson and northwestern Geary counties. The lake is just above the point where the Republican River joins with the Smoky Hill River to form the Kansas River. The floodplain of the Republican River here is one to two kilometers wide, and the valley fill can be as much as 24 meters thick (Fader 1974).

The underlying bedrock of Milford Lake is made up of Permian shales and limestones of the Chase and Council Grove groups. Eolian and alluvial sediments of Pleistocene and post-Pleistocene age mantle the bedrock in many places. Areas surrounding the Republican River are influenced to a great degree by windblown materials. The relief of these loess uplands is typified by moderately deep entrenched drainageways having gently sloping and steeply sloping convex-shaped surfaces with nearly level and gently sloping divides lying between the drainageways. Large volumes of loess have been eroded from the uplands and transported downslope by water and gravity. This "reworked" loess mantles river terraces in some locations, and is often intermixed with bedrock-derived colluvium on side slopes. Divides in areas distant from

major rivers are characterized by deeply entrenched valleys with steep slopes. Outcrops of bedrock are prominent on the hillsides.

Soils data from the U. S. Soil Conservation Service's county soil surveys were used to prepare the accompanying map (Figure 2). The Geary County Soil Survey was published in 1960 and includes the southern half of Milford Lake. Since this soil survey was prepared prior to the construction of Milford Lake, the soils of the now inundated multi-purpose pool are included. Milford Lake was constructed before the preparation of the Dickinson County Soil Survey (Jantz and Jaffry 1980) and the Riley County Survey (Jantz et al. 1975). However, the portion of the project area located within these two counties is outside the multipurpose pool, and therefore, complete soil mapping is available for these two counties as well. The Soil Survey for Clay County is presently in the final stages of completion. Preliminary soil maps and soil descriptions were obtained from the Clay County Soil Conservation Service office which provide complete coverage for all of Clay County, with the exception of the Milford Lake multipurpose pool. In summary, complete soil mapping is available for the entire Milford Lake project area, with the exception of the northern half of the multipurpose pool located in Clay County.

The soil surveys for the three counties list the soil series and their associated landforms and break these various soil series down into subdivisions based on slope, erosion, and other factors. For the purpose of this report, the various subdivisions have been consolidated into the principal series listed in Table 3 . The table identifies their associated parent materials, landforms and geomorphic surfaces as well. The soil-geomorphic relationships shown in this table were used to prepare the terrain map (Figure 2).

Table 3. Soil series, landform description and interpreted geomorphic surface for soils in the Milford Lake project area.

| Soil Series | Parent Material | Landform | Geomorphic Surface |
|---|---|---|---|
| GEARY COUNTY | | | |
| Cass | Alluvium | First bottoms | T-0 Floodplain |
| Crete | Loess | Uplands | Uplands |
| Dwight | Shale | Uplands | Uplands |
| Geary | Loess | Uplands | Uplands |
| Hobbs | Alluvium | First bottoms of secondary streams | T-0 Floodplain |
| Irwin | Shale | Uplands | Uplands |

continued

Table 3 continued. Soil series, landform description and interpreted geomorphic surface for soils in the Milford Lake project area.

| Soil Series | Parent Material | Landform | Geomorphic Surface |
|---|---|---|---|
| Monoma | Loess | Slopes and uplands | Slope and Upland |
| Muir | Alluvium | Second bottoms | T-1 Terrace |
| Riverwash | Alluvium | | T-0 Floodplain |
| Sharpy | Alluvium | Sand dunes, flooded | T-0 Floodplain |
| Shellaburger | Loess | Uplands | Uplands |
| Sogn | Limestone | Uplands | Uplands |
| Sutphen | Alluvium | Second bottoms | T-1 Terrace |
| Tully | Colluvium | Slopes | Slopes |
| Hastings | Loess | Uplands | Uplands |
| Farnum | Loess | | |
| Florence | Cherty Limestone | Cherty clay loam on uplands | Uplands |
| DICKINSON COUNTY | | | |
| Carwile | Alluvium and loess | Concave areas on uplands | Uplands |
| Clime | Shale | Uplands | Uplands |
| Crete | Loess | Uplands | Uplands |
| Irwin | Shale | Uplands | Uplands |
| Hobbs | Alluvium | Floodplain | T-0 Floodplain |
| Muir | Alluvium | Terraces and high bottoms that rarely flood | T-1 Terrace |

continued

Table 3 continued. Soil series, landform description and interpreted geomorphic surface for soils in the Milford Lake project area.

| Soil Series | Parent Material | Landform | Geomorphic Surface |
|---|---|---|---|
| RILEY COUNTY | | | |
| Alluvial Land | Alluvium | Intermittent drainageways and on floodplains or major streams, frequently flooded | T-0 Floodplain |
| Breaks Alluvial Land Complex | Limestone, Shale | Intermittent drainage on uplands | Uplands |
| Clime-Sogn Complex | Limestone | Upland slopes | Slopes |
| Dwight-Irwin Complex | Limestone | Ridgetops | Uplands |
| Geary | Loess | Uplands | Uplands |
| Irwin | Shale | Uplands | Uplands |
| Reading | Alluvium | Terraces of creeks rarely flooded | T-1 Terrace |
| Smolan | Loess | Uplands | Uplands |
| Tully | Colluvium | Slopes, footslopes | Slopes |
| Wymore | Loess | Uplands | Uplands |
| CLAY COUNTY | | | |
| Calco | Alluvium | Floodplain | T-0 Floodplain |
| Cass | Alluvium | Occurs on flooded or river bottom | T-0 Floodplain |
| Clime | Shale | Uplands | Uplands |
| Crete | Loess | Uplands | Uplands |
| Geary | Loess | Uplands | Uplands |

continued

Table 3 continued. Soil series, landform description and interpreted geomorphic surface for soils in the Milford Lake project area.

| Soil Series | Parent Material | Landform | Geomorphic Surface |
|---|---|---|---|
| Eudora | Alluvium | Occasionally flooded on river bottom | T-0 Floodplain |
| Haynie-Sarpy | Alluvium | Occasionally flooded | T-0 Floodplain |
| Hobbs | Alluvium bottoms | Flooded creek | T-0 Floodplain |
| Holder | Shale | Uplands | Uplands |
| Kipson-Sogn | Limestone | Uplands | Uplands |
| Muir | Alluvium | Terraces | T-1 Terraces |

The upland soils formed in Pleistocene loess are the Monoma, Hastings, Crete, Geary, Farnum, and Shellaburger series. With the exception of the Monoma series, these soils are characterized by well-developed argillic B horizons. The Monoma series is a weakly developed soil formed from silty loess. In many places, it is underlain by a buried paleosol at depths of one to two meters.

The Florence, Sogn, Dwight, Irwin, and Holder series are soils formed in limestone or shale residuum. Most of these soils are less than one meter thick, and they often contain large volumes of chert.

The Tully series is a soil formed in thick colluvial deposits on foot slopes. This soil may contain alluvium where colluvial deposits merge with terraces.

The T-1 terrace soils are the Muir, Sutphen, and Reading series. The Sutphen and Muir soils are found on terraces of the Republican River, and the Muir and Reading soils are found on terraces of tributaries. The terrace soils, with the exception of the Sutphen, are characterized by well developed profiles, although only the Reading has an argillic B horizon.

The soils on the T-0 floodplain are the Cass, Hobbs, Riverwash, Sharpy, Eudora, Cako, and Alluvial Land series. All of these soils are characterized by poorly developed A/C profiles. The lack of a B horizon in the T-0 soils reflects the relatively young age of the sediments and the instability of the floodplain environment.

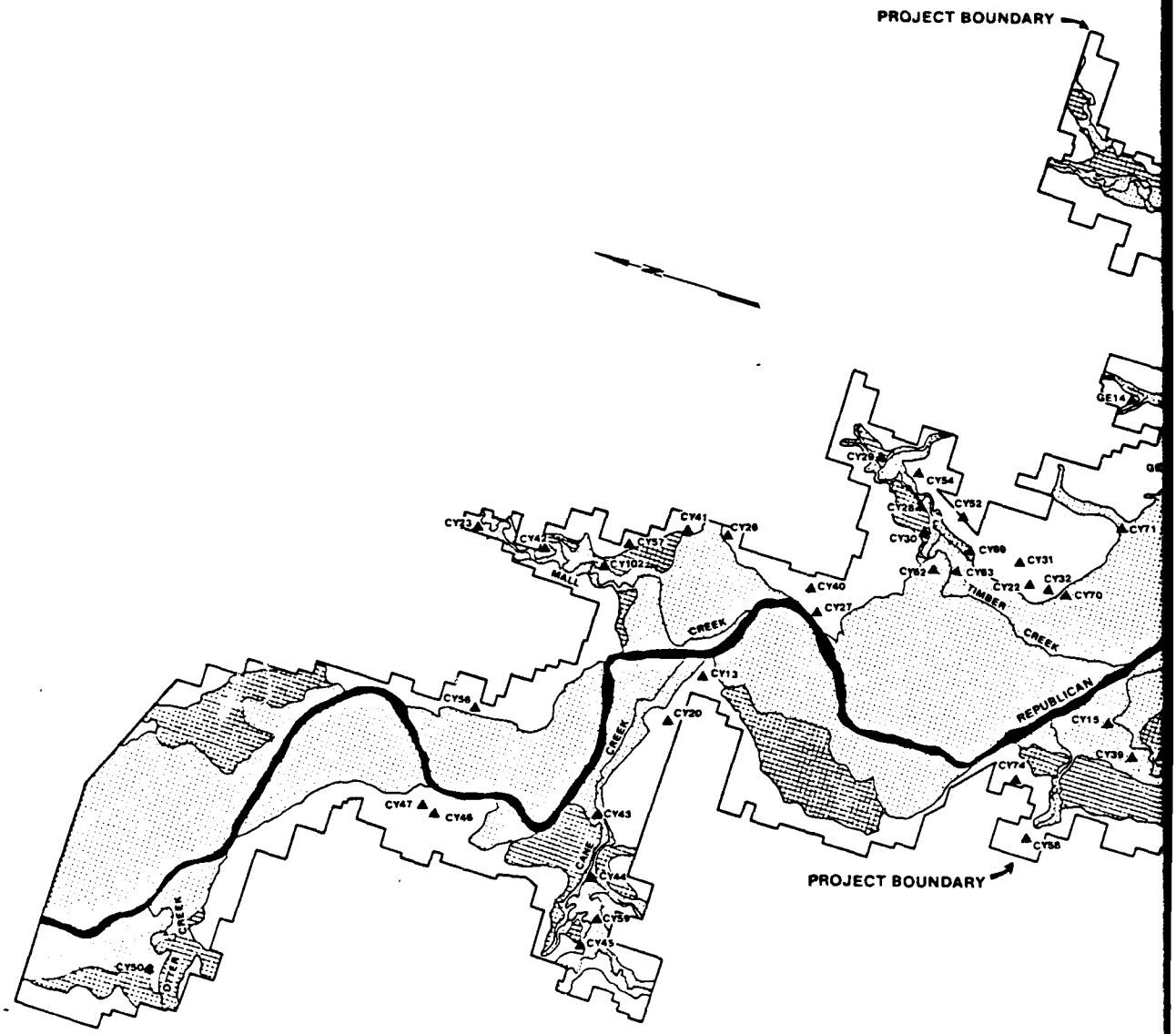
Unfortunately, there are few radiometric dates from the alluvial sediments in the Republican River valley. A sample of wood charcoal recovered from 25 to 30 cm below the T-1 surface at 14DN325 yielded a date of 750±60 years B.P. Charcoal recovered from about the same depth in the T-1 deposit at 14DN326 provided a date of 860±80 years B.P. Kopsick (1980:36) suggests that the T-0 floodplain on the Republican is the same Quaternary alluvium mapped by Fader (1974) for the Kansas River at Junction City. A similar T-0 deposit of the Kansas River has been radiocarbon dated at no more than 2400 years B.P. (Kopsick 1980).

The meandering activity of the Republican during the last 3000 years has removed many of the older T-1 alluvial deposits except where they have been protected by bedrock or flexures in the valley bedrock. Where these older surfaces are preserved (Figure 2), they correlate to the Newman Terrace on the Kansas River and have been dated as late Pleistocene to Holocene in age (Fader 1974). There are no early or middle Pleistocene terrace deposits (T-2 terraces) preserved in the valley around the lake. The T-1 Newman terrace, or its equivalent, is largely covered by the waters of Milford Lake in Geary County, although it is exposed above the shoreline in Clay County. However, nearly all the tributary valleys of the Republican contain portions of this T-1 terrace deposit. The area both north and south of Wakefield has Newman terrace remnants, as do Quimby and Cane Creeks (Figure 2).

Much of the data used to develop the alluvial chronology of sediments in the Milford Lake area has been extrapolated from research done in other parts of eastern Kansas. Most of the geologic and archaeological data was produced without the benefit of radiocarbon dates. The few dates that have been developed come from areas on the Kansas River from as far away as Bonner Springs. For this reason the dating of sediments and surfaces are only referred to in general terms.

It is felt that the lack of radiocarbon dates for sediments in Geary and Clay counties does not prevent development of a model with specific test implications for Milford Lake. Archaeological and geological investigations in the Pomme de Terre drainage in southwestern Missouri (Brackenridge 1981), the Hinkson-Perche drainage in central Missouri (Kopsick 1983), the Little Blue drainage in western Missouri, and along the Kansas River (Kopsick 1980, 1981) have indicated that the correlation of the ages for T-0 and T-1 terraces are comparable throughout these areas. Regional correlation of late Quaternary landscapes are discussed later in this chapter.

Data from the Milford terrain analysis was combined with geological, archaeological and chronological studies conducted along the Kansas River. This area was selected for comparison since it provides the nearest set of data. Based on three radiocarbon dates from T-0 sediments along the Kansas River (Kopsick 1980), any excavations on the upper three meters of the T-0 terrace should encounter sediments no older than 2500 years B.P. Since T-0 sediments are incised into T-1 sediments, the bulk of the T-1 sediments will be older than the oldest T-0 sediments, that is to say 2500 or more years old. T-1 terrace sediments near Bonner Springs, Kansas have contained several paleosols of which the oldest has been dated at roughly 9700 years B.P. (Chris


PROJECT BOUNDARY
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CY15
CY39
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CY58
PROJECT BOUNDARY
CY41
CY26
CY42
CY57
CY102
MALL
CREEK
CY56
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COTTER
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TIMBER
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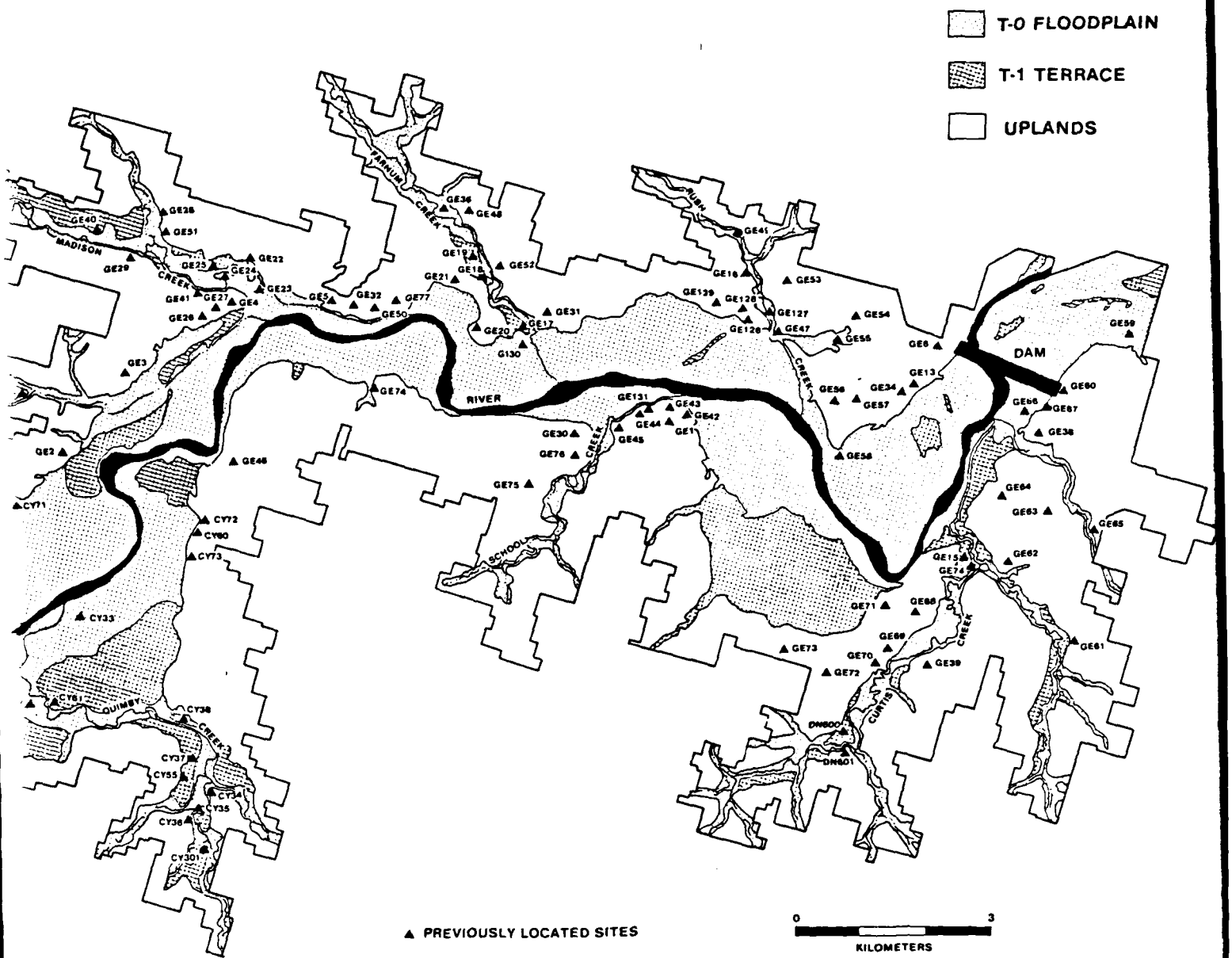



Figure 2. Location of terrain surfaces and previously record archaeological sites at Milford Lake.



2

Holien: personal communication). Geomorphically, the T-1 terrace (Newman terrace) at Milford has been traced along the Kansas River valley all the way downstream to Bonner Springs (Fader 1974). This indicates that the T-1 terrace at Milford Lake contains a modern surface and a stable soil with Plains Woodland to Plains Village aged cultural material within or just below the plowzone. Below the plowzone, the sediments should correlate in age from late Pleistocene and early Holocene at the base to middle and late Holocene near the surface, roughly 12,000 to 3000 years B.P.

Colluvial deposits, particularly where they intersect or overlap with T-1 terrace surfaces, contain late Archaic and Woodland artifacts. Thus, these deposits are at least late Holocene in age.

The upland surfaces vary from deep soils formed on loess (Geary silt loam) to shallow, stony soils over bedrock (Florence cherty clay loam). In areas topographically higher than colluvial deposits, the surfaces should all have been exposed since the end of the Pleistocene. Barring the occurrence of Holocene loess deposits, Late Pleistocene and Holocene age cultural resources should be only shallowly buried or on the surface of these uplands.

## MELVERN AND POMONA LAKES

Melvern and Pomona lakes are located near the headwaters of the Marais des Cygnes River. Melvern Lake impounds a section of the Marais des Cygnes River, while Pomona Lake dams Dragoon and One Hundred and Ten Mile creeks.

Physiographically, the Melvern and Pomona Lake project areas are part of the Osage Plains. The landscape of the area is a dissected plain developed on unequally resistant shale and limestone. Differential erosion of the bedrock has produced a gently rolling topography of valleys and escarpments with moderate to steep slopes adjacent to most of the river and creek valleys. The surface bedrock of Osage County consists of Pennsylvanian and Permian formations overlain in many places by Quarternary and Tertiary alluvial deposits. The geology of the area has been investigated by O'Connor (1955) who identified a number of terrace surfaces. O'Connor broke the alluvial deposits down into a floodplain complex comprised of the floodplain and a low terrace, and a series of older and higher terraces and terrace remnants located along the valley walls and upland slopes.

The floodplain complex identified by O'Connor has a maximum thickness of about 40 ft in the Marais des Cygnes valley and is much less in the tributaries. O'Connor recognized two separate levels of alluvial deposits in the floodplain alluvial complex of the larger stream valleys. The older and higher level was described as comprising 90 percent of the floodplain and even occupying the entire floodplain in many areas of the valleys. In the widest part of the valley, this surface is flat and poorly drained. The younger and lower alluvial

surface is located 2 to 10 ft below the older and higher part of the floodplain. This younger surface comprises ten percent of the floodplain, but ranges from 40 percent to little or none of the floodplain complex locally.

O'Connor defined remnants of four alluvial terraces at elevations of 10-15, 60-75, 80-95 and 140-160 ft above the present alluvial floodplain surface. The lower of these he attributed to be Illinoian in age, the second to be Nebraskan and the upper two to be early Pleistocene or Tertiary in age. The older three terraces are highly weathered and lithologically similar, consisting of siliceous sand and gravel, principally chert, up to several inches in diameter. The chert is chiefly derived from Permian rocks of the Flint Hills region. These gravel deposits range from a few inches to 12 ft in thickness. As the terraces are traversed eastward along the Marais des Cygnes, their relative position in the local topography becomes higher. While O'Connor recognized the breakdown of the modern floodplain complex into two surfaces, both of these surfaces were mapped as a single Quarternary alluvial unit.

A soil survey for Osage County has not been published. However, the soils have been mapped, and a survey is currently in preparation. A set of soil maps and soil descriptions were obtained from the Soil Conservation Service Osage County office. Since this soil survey was completed recently, the terrain under the multipurpose pool of Melvern and Pomona Lakes was not included. The terrain underlying Melvern Lake, however, was mapped in the late 1940s. The 1940s work served as part of the basis for the current soil maps, although a number of soils have been reclassified since that time.

A total of 14 soil series or complexes are mapped at Melvern Lake (Table 4). The parent material of five, the Verdigris, the Osage, the Mason, the Woodson and the Olpe-Kenoma, is alluvium. We correlate the former three soils with the floodplain alluvial complex defined by O'Connor, while the Woodson and Olpe-Kenoma represent older Pleistocene and Tertiary terraces. The Verdigris consists of a deep, well drained soil bordering the modern channel and tributaries of the Marais des Cygnes River. It is characterized by a poorly developed A/C profile. The Osage soil is described as a floodplain soil in the soil survey, although it is typically found at slightly higher positions in the landscape than the Verdigris. This soil has thick, clay-rich B horizon. The high clay content (35 percent) of the subsoil is attributed to accumulation of fine-textured alluvial sediments as the deposit aggraded (Harold Dickey, personal communication). During the dry season, the Osage soil cracks on the surface due to the shrinkage of the 2:1 expanding clays. The cracks usually extend to a depth of one meter or more. While the cracks are open, surface materials fall into them. The cracks close, but because of the "extra" material now present in the lower parts of the profile, a greater volume is acquired and the expanding material passes and slides the aggregates against each other, developing a "lentil" angular blocky structure with slickenside features, or stress cutans, on the ped faces. Because of the presence of slickensides rather than alluvial argillans, the B horizon is not

floodplain of the Marais des Cygnes River into discrete T-0 floodplain and T-1 terrace surfaces. Therefore, the Melvern Lake and Pomona Lake project areas have been mapped into a low T-0/T-1 surface (Osage and Verdigris Series), a T-2 terrace (Woodson Series), older Tertiary terraces (Olpe-Kenoma Series) and an upland/slope surface composed primarily of the Clareson-Eram, Kenoma, Lula and Summit series (Figures 3 and 4).

Only two radiocarbon dates have been obtained for sediments in the Melvern Lake area. Charcoal from 60-80 cm below the low Osage terrace surface at 14LY414 yielded a date of 2300±110 years B.P. A thermoluminescence date of 6300 years B.P. was determined from burnt rock 20 cm below the terrace surface at 140S17. The truncated B horizon of the soil at this site suggested that younger sediments have been stripped off the surface of the T-1 terrace. Based on the older date of 6300 years B.P., these sediments are at least mid-Holocene in age.

In summary, at Melvern and Pomona lakes, nearly 90 percent of the alluvial deposits are Holocene in age, with mid-Holocene (6300 years B.P.), late Holocene (2300±110 years B.P.), and more recent sediments near the surface. The terrain analysis indicates that the slightly higher portions of the floodplain occupied by Osage soils are older T-1 terraces. These terraces probably correlate in age to T-1 terraces described and dated in other parts of the Osage River drainage basin (Haynes 1976).

Haynes (1981:497) noted that the terraces in some locations of the Pomme de Terre valley are so close in elevation that they are not distinguishable on the basis of elevation alone. The same situation apparently occurs on the floodplain of the Marais des Cygnes River.

Between the loess covered uplands and the T-1 terrace surface at Melvern and Pomona lakes, there can be found either colluvial deposits or older terrace deposits. The older terrace deposits are Tertiary and late Pleistocene in age, although some have been mapped by O'Connor (1955) as Kansan in age.

Some interesting comparisons can be made between the project areas in the Marais des Cygnes and Republican River valleys. Milford Lake is located in a deep, wide valley of a major river, while Melvern and Pomona lakes are located in shallow, narrow valleys in the headwaters of a smaller river. The implications are that fluvial activity, particularly meandering, downcutting and flooding, occur to a greater extent along the Republican River and produce more dramatic and distinct geomorphic surfaces. Along the upper Marais des Cygnes River, the area of the upper drainage basin is smaller in comparison to the lower Republican River, and so the separation of geomorphic surfaces at Melvern and Pomona lakes is less distinct due to the smaller scale of fluvial activity in the past.

At Milford Lake, most of the early Holocene T-1 terrace deposits have been removed by late Holocene channel migration. Only a few remnants of T-1 deposits remain in the main valley, while the majority of the tributary valleys contain dissected T-1 terrace sediments. At

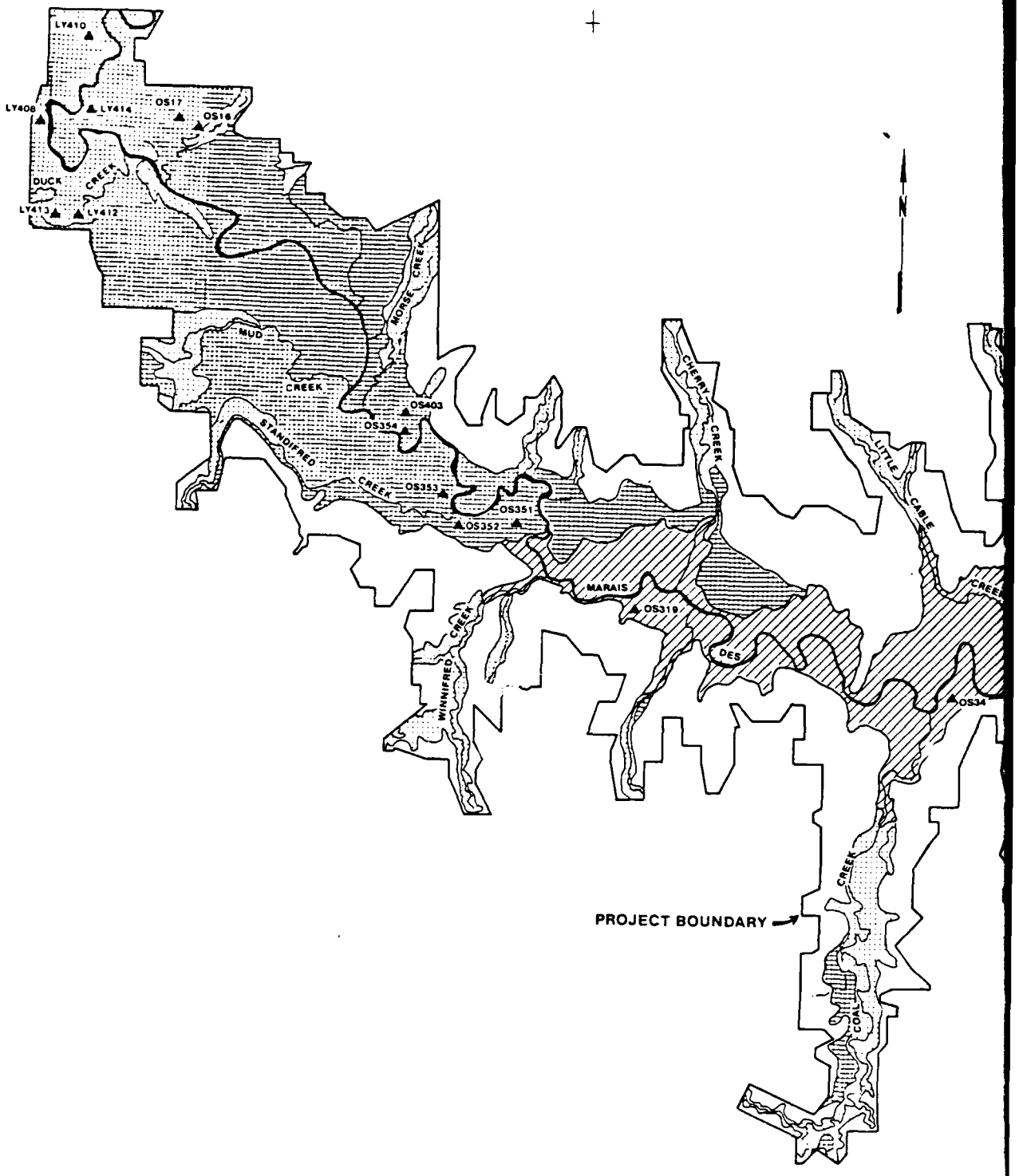
Melvern and Pomona lakes, the effects of late Holocene valley incision and aggradation are not well-defined. Our analysis of the alluvial deposits indicate that Archaic and older cultures would be buried at various depths below the surface of the T-1 terrace. The T-0 terrace should contain modern artifacts on the surface with the basal T-0 sediments being only about 1000-2500 years old. The uplands surfaces, which are largely late Pleistocene in age, should contain a full range of artifacts from Paleo-Indian to Historic Euroamerican.

## REGIONAL CORRELATION OF LATE QUATERNARY LANDSCAPES

The present study identified Holocene and Late Pleistocene age landscapes in the Republican and Marais des Cygnes River valleys. Unfortunately, a lack of radiocarbon dates for sediments in the study areas precluded the determination of absolute alluvial chronologies. However, the study region is in a portion of the East-Central Plains that is encircled by rivers which have yielded time-stratigraphic data. These data have been used to reconstruct the regional alluvial chronology for the Holocene and Late Pleistocene (e.g. Thompson and Bettis 1980; Artz 1980, 1984). Thus, the alluvial chronologies of the Republican and Marais des Cygnes Rivers may be inferred from a broad spectrum of geomorphic evidence collected outside of the study region. The following discussion focuses on some of this geomorphic evidence.

In the Little Blue River drainage of western Missouri, radiocarbon dates show that the upper 2.9 m of the T-1 deposit aggraded between 4500 and 2000 years B.P. Aggradation either slowed or ceased between 2500 and 2000 years B.P., as inferred from the large number of unburied Woodland and post-Woodland sites found on present-day T-1 surfaces (Kopsick 1982). After 2000 years B.P., but before 1420-1460 years B. P., the Little Blue renewed its downcutting and the present floodplain (T-0) began to aggrade. The upper 1 m of the T-0 fill at 23JA43 aggraded between 750 and 150 years B.P. The date of 150 years B.P. is from a soil which is believed to have formed before Euroamerican settlement in the mid-nineteenth century. According to Kopsick (1982), alluvium burying this soil reflects increased runoff and sediment yield due to land clearance and cultivation.

The alluvial sequences in the Truman Reservoir area of west central Missouri have been studied extensively by a number of researchers (Haynes 1976, 1977, 1978, 1981, Ahler 1973, 1976; Johnson 1977; Brackenridge 1978, 1979, 1981; Lees et al. 1982). The bottoms of the major stream valleys contain an extensive system of Pleistocene and Holocene alluvial terraces. Terrace T-1c of the Pomme de Terre River, known as the Rodgers alluvium, was deposited in four episodes (T-1c1 to T-1c4) between ca. 11,000 and 1000 years B. P. (Ahler 1976; Haynes 1981). The T-1c alluvium is younger than the 13,550 years B.P. date for the uppermost Bonney Spring alluvium (T-1b) and older than the 840 years B.P. date on the Pippins alluvium (T-0). The T-1c terrace was abandoned by the Pomme de Terre River after 1500 years B.P. The modern floodplain


LY410
LY408
LY414
OS17
OS16
DUCK
CREEK
LY413
LY412
MUD
CREEK
MORSE CREEK
OS403
OS354
STANDIFRED
CREEK
OS353
OS351
OS352
CHERRY
CREEK
LITTLE
CABLE
CREEK
MARAIS
OS319
DES
WINNIFRED CREEK
OS34
COAL
CREEK
PROJECT BOUNDARY
N

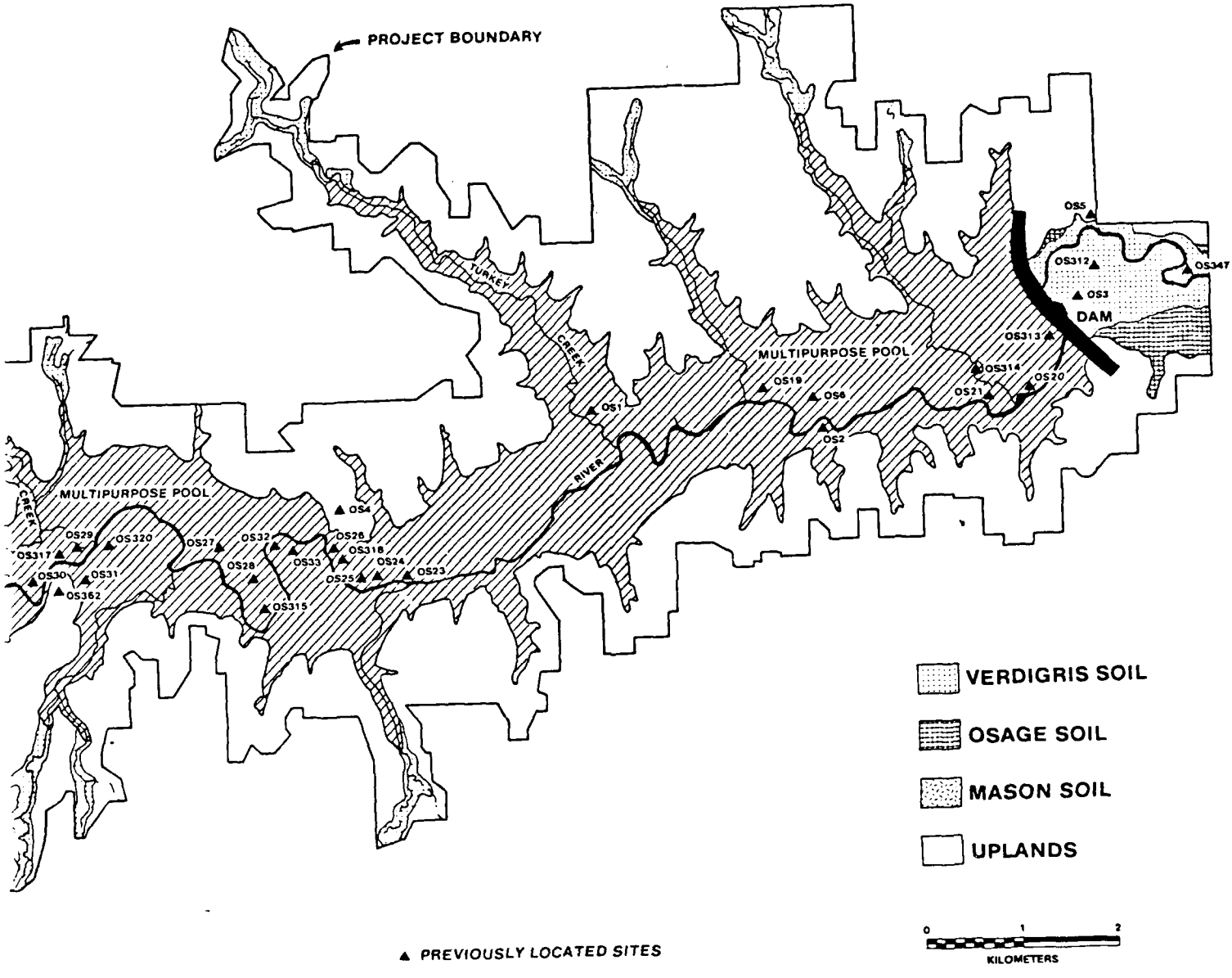
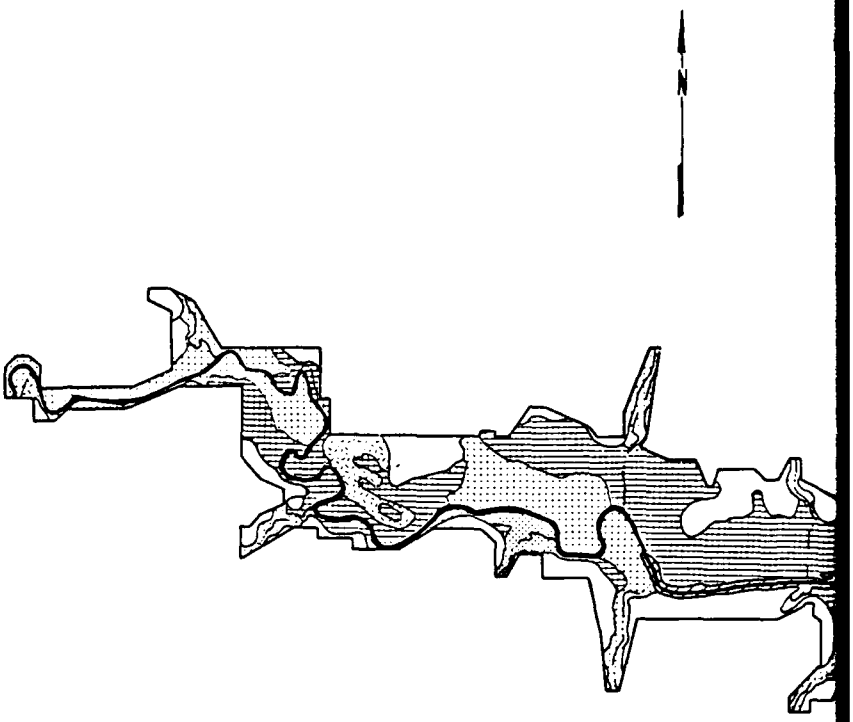



Figure 3. Location of terrain surfaces and previously recorded sites at Melvern Lake.


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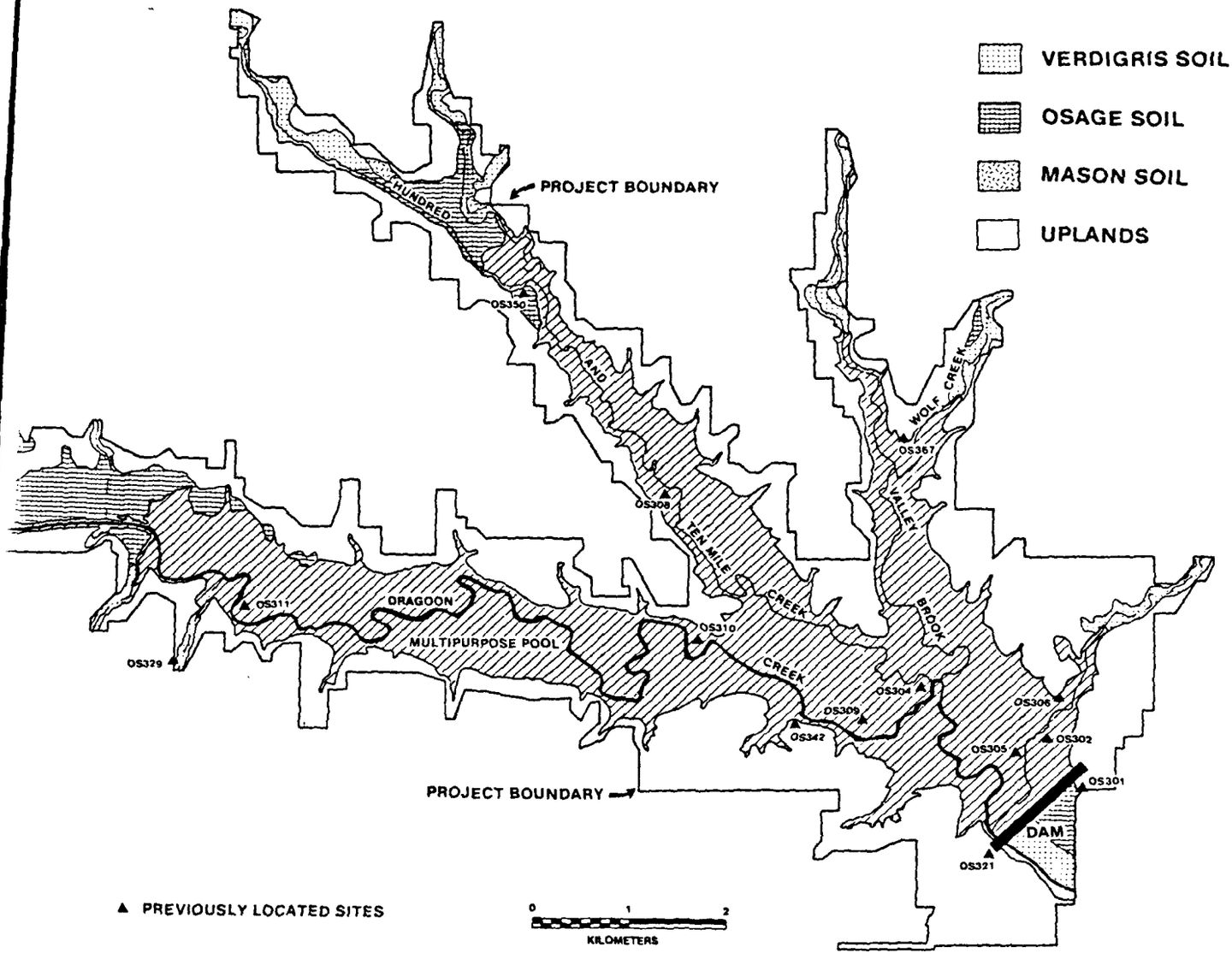



Figure 4. Location of terrain surfaces and previously sites at Pomona Lake.

began forming around 1,000 years B.P. and continued to aggrade until after 600 years B.P., when downcutting occurred. A return to conditions of net aggradation took place shortly before 300 years B.P., as evidenced by a radiocarbon date from Rodgers Shelter (Haynes 1981).

A recent study of alluvial soils in the upper Walnut River basin of the southern Flint Hills of Kansas (Artz 1984) documents approximately 4000 years of changing fluvial environments. A soil on the T-1 terrace of the Walnut River formed between 4000 and 2000 radiocarbon years B.P. Burial of this soil has occurred on colluvial footslopes and fan deposits at the edge of the valley and on abandoned levees and channels active between 2000 and 1000 years B.P. Artz (1984) suggests that localized deposition during this period was accompanied by increased fluvial activity, culminating in channel entrenchment and the abandonment of T-1 surfaces.

The three chronologies summarized in the preceding discussion each contain at least one major episode of stream entrenchment during the Late Holocene, which ended a previous episode of aggradation or soil formation. On the Little Blue and Walnut Rivers, the transition from T-1 aggradation or stability to entrenchment occurred at 2000 years B.P. On the lower Pomme de Terre River, the T-1 was abandoned sometime between 1680 and 840 years B.P. A number of other studies from Kansas, Missouri, Iowa and Oklahoma document geomorphic events similar to, and synchronous with, those documented in the previous discussion. For example, on Cotton Creek on the Littley Caney River in northeastern Oklahoma, a major geomorphic transition involving stream entrenchment occurred at 1200 years B.P. (Hall 1977). Stream valleys in western Iowa experienced rapid accumulation of sediments between 3500 and 2000 years B.P. (Thompson and Bettis 1980). Alluviation was terminated in these valleys by renewed downcutting shortly after 2000 years B.P., and was followed by an episode of aggradation. A final episode of gullying occurred in western Iowa around 1000 years B.P. and was followed by alluviation between 7000 and 100 years B.P. (Thompson and Bettis 1980).

It is apparent that a major fluvial-geomorphic discontuity occurred in the East-Central Plains between ca. 1000-2000 years B.P. Artz (1984) suggests that the general synchroneity of episodes of aggradation, stability and degradation supports the hypothesis that these geomorphic changes were climatically induced. The pattern is especially significant in that the alluvial chronologies used in this analysis represent reponses in drainages of widely varying sizes, including the Missouri-Kansas, Arkansas and Red River systems. Synchronous responses over such a range is difficult to explain by other mechanisms, such as base-level changes (Artz 1984).

It is likely that the Republican and Marais des Cygnes Rivers responded to the same climatically induced hydrologic changes documented in other river valleys of the East-Central Plains. Thus, the sequence and age of floodplain and terrace deposits should be similar to those identified in nearby river valleys. Future archaeological and geomorphological research in the study region hopefully will yield radiocarbon dates that can be used to clearly determine the alluvial chronologies of the Republican and Marais des Cygnes Rivers.

# V. PREVIOUS ARCHAEOLOGICAL RESEARCH AT MILFORD, MELVERN AND POMONA LAKES

Larry J. Schmits

One of the initial steps in formulating the research design for the Melvern, Milford and Pomona Lake archaeological survey and evaluation consisted of a background and literature search. Previous reports were reviewed; the cultural resources management plans for each lake were consulted; archaeological site files at the Kansas State Historical Society (KSHS) were examined; and the National Register of Historic Places and the state register were checked for properties within the project areas. The objectives of this review were to identify the known sites; determine their cultural affiliation, site size and geomorphologic setting; and assess the degree to which each of the lakes has been archaeologically investigated. These data were then used to determine the association of archaeological sites with specific landforms and soil types and to select optimal survey transect intervals.

## Milford Lake

Milford Lake is the most extensively investigated of the three lakes. Five surveys and four excavation projects have occurred within the lake's boundaries. Prior to the 1982 investigations, 120 sites had been recorded in the lake area (Figure 2). In Table 5, the cultural affiliation is given for each site and based generally on the classifications in the Milford Lake cultural resources management plan (O'Brien 1978). Sites are discussed in terms of the cultural-historical periods discussed in Section III (Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Protohistoric, Historic Aboriginal and Historic Euroamerican) of this report rather than the specific units listed in the table. These periods correspond to O'Brien's units in the following fashion: Paleo-Indian (Plano), Plains Archaic (Munkers Creek), Plains Woodland (Schultz), Plains Village (Smoky Hill, Upper Republican, Central Plains), Historic Aboriginal (Historic Pawnee) and Historic Euroamerican (Historic).

The first archaeological investigations conducted in the vicinity of Milford Lake were the work of Floyd Schultz, an amateur archaeologist. Schultz was most active in the 1920s and 1930s collecting sites and excavating mounds along the Republican River, many of which were first identified by him. Schultz's notes and catalogued collections have provided the data for two publications on the archaeology at Milford Lake (Eyman 1966; Schultz and Spaulding 1948).

In 1961, the Kansas State Historical Society excavated three sites in the lake area (Witty 1963). The Woods (14CY30) and Streeter (14CY29) sites were originally recorded by Schultz, while the Avery site

Table 5. Archaeological sites previously recorded from Milford Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE1 (Bogan) | Historic Pawnee | Marshall & Witty 1967 | Tested | Historic Aboriginal | Hastings | Uplands |
| 14GE2 | Schultz | Eyman 1966 | Tested | Plains Woodland | Sogn | Uplands |
| 14GE3 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Geary | Uplands |
| 14GE4 (Berry Mounds) | Schultz, Smoky Hill | Muller & Schock 1964 | Tested | Plains Woodland, Plains Village | Monoma | Slopes/ Uplands |
| 14GE5 | Schultz | Eyman 1966, Muller & Schock 1964 | Tested | Plains Woodland | Monoma | Slope/ Uplands |
| 14GE6 | Schultz | Schultz & Spaulding 1948 | Tested | Plains Woodland | Hastings | Uplands |
| 14GE13 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE14 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Sogn | Uplands |
| 14GE15 | Smoky Hill, Woodland | Muller & Schock 1964 | Survey | Plains Village, Plains Woodland | Muir | T-1 Terrace |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE16 | Smoky Hill | Muller & Schock 1964 | Tested | Plains Woodland | Hastings | Uplands |
| 14GE17 | Smoky Hill, Schultz | Muller & Schock 1964 | Tested | Plains Woodland, Plains Village | Muir | T-1 Terrace |
| 14GE18 | Smoky Hill | Muller & Schock 1964 | Survey | Plains Village | Muir | T-1 Terrace |
| 14GE19 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Muir | T-1 Terrace |
| 14GE20 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE21 (Miller) | Smoky Hill, Woodland, Archaic | Sperry 1964, O'Brien 1976 | Tested | Plains Village, Plains Woodland, Plains Archaic | Hastings | Uplands |
| 14GE22 | Smoky Hill | Muller & Schock 1964 | Survey | Plains Village | Sogn | Uplands |
| 14GE23 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Cass | T-0 Floodplain |
| 14GE24 | Smoky Hill | Muller & Schock 1964 | Survey | Plains Village | Hobbs | T-0 Floodplain |
| 14GE25 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Muir | T-1 Terrace |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE26 | Archaic (?) | Muller & Schock 1964 | Survey | Unknown Prehistoric | Sogn | Uplands |
| 14GE27 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Hastings | Uplands |
| 14GE28 | Smoky Hill, Munkers Creek Archaic | Muller & Schock 1964 O'Brien 1976 | Survey | Plains Village, Plains Archaic | Hastings | Uplands |
| 14GE29 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Crete | Uplands |
| 14GE30 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE31 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE32 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE33 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Muir | T-1 Terrace |
| 14GE34 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Sogn | Uplands |
| 14GE36 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE38 | Archaic, Schultz | O'Brien 1976 | Survey | Plains Archaic, Plains Woodland | Monoma | Slope/ Uplands |
| 14GE39 | Munkers Creek Archaic (?) | O'Brien 1976 | Survey | Unknown Prehistoric | Crete | Uplands |
| 14GE40 | Archaic? Plano? | O'Brien 1976 | Survey | Unknown Prehistoric | Monoma | Uplands |
| 14GE41 | Archaic, Schultz | Parks 1978 | Tested | Plains Archaic, Plains Woodland | Hastings | Uplands |
| 14GE42 | Unknown, Archaic | O'Brien 1976 | Survey | Plains Archaic | Hastings | Uplands |
| 14GE44 | Paleo-Indian? Archaic? | O'Brien 1976 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE43 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE45 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE46 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE47 | Smoky Hill, Schultz | O'Brien 1976 | Survey | Plains Village, Plains Woodland | Hastings | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE48 | Smoky Hill | O'Brien 1976 | Survey | Plains Village | Crete | Uplands |
| 14GE49 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |
| 14GE50 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Hastings | Uplands |
| 14GE51 | Early Archaic (?) | O'Brien 1976 | Survey | Unknown Prehistoric | Geary | Uplands |
| 14GE52 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Sogn | Uplands |
| 14GE53 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE54 | Historic | Schwiekhard and | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE55 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Cass | T-0 Floodplain |
| 14GE56 | Historic | Schwiekhard and O'Brien | Survey | Historic Euroamerican | Hastings | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE57 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE58 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Cass | T-0 Floodplain |
| 14GE59 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Cass | T-0 Floodplain |
| 14GE60 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE61 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Crete | Uplands |
| 14GE62 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Sogn | Uplands |
| 14GE63 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Crete | Uplands |
| 14GE64 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE65 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Crete | Uplands |
| 14GE66 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Cass | T-0 Floodplain |
| 14GE67 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hobbs | T-0 Floodplain |
| 14GE68 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |
| 14GE69 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Sogn | Uplands |
| 14GE70 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Sogn | Uplands |
| 14GE71 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE72 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Crete | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE73 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE74 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Muir | T-1 Terrace |
| 14GE75 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |
| 14GE76 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Hastings | Uplands |
| 14GE77 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Shella-burger | Uplands |
| 14GE126 | Schultz | Sperry 1965 | Tested | Plains Woodland | Sogn | Uplands |
| 14GE127 (Rush Creek) | Smoky Hill | Sperry 1965 | Tested | Plains Village | Hobbs | T-0 Floodplain |
| 14GE128 | Archaic (?) | Sperry 1965 | Survey | Unknown Prehistoric | Sogn | Uplands |
| 14GE129 | Schultz | Sperry 1965 | Tested | Plains Woodland | Shella-burger | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14GE130 | Unknown | Sperry 1965 | Survey | Unknown Prehistoric | Sharpy | T-0 Floodplain |
| 14GE131 | Schultz, Upper Republican | Sperry 1965 | Tested | Unknown Prehistoric | Hastings | Uplands |
| 14CY13 | Schultz | Muller & Schock 1964 Eyman 1966 | Survey | Plains Woodland | Geary | Uplands |
| 14CY15 | Woodland | Muller & Schock 1964 | Survey | Unknown Prehistoric | Unknown | T-0 Floodplain |
| 14CY20 | Schultz | Muller & Schock 1964 | Tested | Plains Woodland | Geary | Uplands |
| 14CY22 | Central Plains | Muller & Schock 1964 | Tested | Plains Woodland | Geary | Uplands |
| 14CY23 | Schultz | Muller & Schock 1964 | Tested | Plains Woodland | Unknown | Uplands |
| 14CY26 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Kipson-Sogn | Uplands |
| 14CY27 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Kipson-Sogn | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14CY28 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Muir | T-1 Terrace |
| 14CY29 (Streeter) | Woodland | Witty 1963 | Tested | Plains Woodland | Muir | T-1 Terrace |
| 14CY30 (Woods) | Smoky Hill | Witty 1963 | Tested | Plains Village | Muir | T-1 Terrace |
| 14CY31 | Schultz, Historic | Eyman 1966 | Survey | Plains Woodland, Historic Euroamerican | Geary | Uplands |
| 14CY32 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Geary | Uplands |
| 14CY33 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Unknown | T-0 Floodplain |
| 14CY34 | Central Plains | Muller & Schock 1964 | Survey | Plains Village | Crete | Uplands |
| 14CY35 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |
| 14CY36 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Crete | Uplands |
| 14CY37 | Woodland, Central Plains | Muller & Schock 1964 | Survey | Plains Woodland, Plains Village | Crete | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14CY38 | Central Plains | Muller & Schock 1964 | Survey | Plains Village | Muir | T-1 Terrace |
| 14CY39 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Unknown | T-0 Floodplain |
| 14CY40 | Schultz | Muller & Schock 1964 | Survey | Plains Woodland | Geary | Uplands |
| 14CY41 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Crete | Uplands |
| 14CY42 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Unknown | T-0 Floodplain |
| 14CY43 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |
| 14CY44 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |
| 14CY45 | Archaic (?) | Muller & Schock 1964 | Survey | Unknown Prehistoric | Crete | Uplands |
| 14CY46 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Holden | Uplands |
| 14CY47 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Holden | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14CY50 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Muir | T-1 Terrace |
| 14CY52 (Woods) | Schultz | Eyman 1966, Muller and Schock 1964 | Survey | Plains Woodland | Crete | Uplands |
| 14CY54 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Kipson-Sogn | Uplands |
| 14CY55 | Archaic or Woodland (?) | Muller & Schock 1964 | Survey | Unknown Prehistoric | Muir | T-1 Terrace |
| 14CY56 | Woodland | Muller & Schock 1964 | Survey | Plains Woodland | Geary | Uplands |
| 14CY57 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Unknown | Uplands |
| 14CY58 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Kipson-Sogn | Uplands |
| 14CY59 | Unknown | Muller & Schock 1964 | Survey | Unknown Prehistoric | Hobbs | T-0 Floodplain |
| 14CY60 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Geary | Uplands |
| 14CY61 | Smoky Hill | O'Brien 1976 | Tested | Plains Village | Unknown | T-1 Terrace |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14CY62 | Smoky Hill, Schultz | O'Brien 1976 | Survey | Plains Village, Plains Woodland | Eudora | T-0 Floodplain |
| 14CY63 | Schultz | O'Brien 1976 | Survey | Plains Woodland | Unknown | T-0 Floodplain |
| 14CY69 | Historic | Schweikhard and O'Brien 1982 | Survey | Historic Euroamerican | Muir | T-1 Terrace |
| 14CY70 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |
| 14CY71 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Unknown | T-0 Floodplain |
| 14CY72 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |
| 14CY73 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Geary | Uplands |
| 14CY74 | Historic | Schwiekhard and O'Brien 1982 | Survey | Historic Euroamerican | Crete | Uplands |

continued

Table 5 continued. Archaeological sites previously recorded from Milford Lake.

| NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 14CY102 | Central Plains | Sperry 1965 | Survey | Plains Village | Unknown | T-1 Terrace |
| 14CY301 (Avery) | Archaic, Woodland | Witty 1963 | Survey | Plains Archaic, Plains Woodland | Muir | T-1 Terrace |
| 14DN600 | Archaic | O'Brien 1976 | Tested | Plains Archaic | Muir | T-1 Terrace |
| 14DN601 | Unknown | O'Brien 1976 | Survey | Unknown Prehistoric | Geary | Uplands |

(14CY301) was reported by another amateur. Woods and Avery yielded significant data: the former was a Plains Village Tradition earthlodge village and the latter a multicomponent site. The Streeter site was a disturbed Woodland site.

Following the activities of the Kansas State Historical Society, the University of Kansas conducted a survey of the lake area (Muller and Schock 1964) which resulted in the location of 63 sites. In 1964 and 1965, the University of Nebraska continued the survey and testing program, with eight new sites located and five tested (Sperry 1965). In addition, two Smoky Hill lodge sites were excavated. In 1967, the Kansas State Historical Society tested the Bogan site, 14GE1 (Marshall and Witty 1967). Bogan, which is now on the National Register, was a fortified Historic Pawnee earthlodge village overlooking the Republican River. A subsequent study of historic Pawnee sites has attributed Bogan to a late 18th century occupation by the Republican band (Roberts 1978).

A shoreline survey conducted in 1975 by Kansas State University (KSU) recorded 20 new sites and two previously located sites (O'Brien 1976). In 1977, test excavations carried out by KSU at 14GE41, a Schultz habitation site, recovered features and associated organics (Parks 1978). Subsequent to the investigation, erosional activity destroyed the remainder of the site. This excavation was followed in 1979 by a survey of 15 percent of the public use areas, also by KSU, which recorded no new prehistoric sites but added 32 historic sites to the inventory (Schwiekhard and O'Brien 1982). A survey of Milford State Park was conducted by the Kansas State Historical Society during March of 1981 for a resurfacing project on portions of existing roads in that area. No new sites were recorded although previously recorded sites 14GE73, 14GE34, 14GE47 and 14GE54 were re-examined. No cultural remains were found at 14GE73 and 14GE34. A few isolated artifacts were recovered at 14GE47 and it was thought that subsurface portions of the site still remained (Witty 1981b).

The locations of the 124 previously recorded prehistoric and historic sites were plotted on topographic maps and then transferred to geomorphic terrain maps (Figure 3). Table 6 lists the distribution of cultural components by terrain types; sites with questionable cultural affiliation have been included within the category of "Unknown Prehistoric". One hundred and thirty-seven components were located: none were Paleo-Indian, 5.1 percent were Plains Archaic, 26.2 percent were Plains Woodland, 13.1 percent were Plains Village, 24.1 percent were Historic Euroamerican and 30.7 percent were Unknown Prehistoric. A single site (0.8 percent) was Historic Aboriginal.

Table 6. Distribution of archaeological components at Milford Lake by geomorphological terrain type.

| Cultural Period | T-0 Terrace | T-1 Terrace | Uplands | Total | Percent |
|---|---|---|---|---|---|
| Paleo-Indian | 0 | 0 | 0 | 0 | 0 |
| Plains Archaic | 0 | 2 | 5 | 7 | 5.1 |
| Plains Woodland | 3 | 5 | 28 | 36 | 26.2 |
| Plains Village | 3 | 7 | 8 | 18 | 13.1 |
| Historic Aboriginal | 0 | 0 | 1 | 1 | 0.8 |
| Historic Euroamerican | 6 | 2 | 25 | 33 | 24.1 |
| Unknown Prehistoric | 11 | 5 | 26 | 42 | 30.7 |
| TOTAL | 23 | 21 | 93 | 137 | 100 |
| Percent | 16.8 | 15.3 | 67.7 | 100 | |

The Plains Archaic period is represented by seven components, two of which are located on the T-1 terrace and five on the uplands. The 36 Plains Woodland components include three on the T-0, five on the T-1 terrace, and 28 on the uplands. The 18 Plains Village components include three on the T-0 floodplain, seven on the T-1 terrace and eight on the uplands. The single Historic Aboriginal site is located on the uplands. The 33 Historic Euroamerican sites include six on the T-0, two on the T-1 and 25 on the uplands. The large number of sites with Unknown Prehistoric components include 11 on the T-0, five on the T-1 terrace, and 26 on the uplands. More than two-thirds of the components (67.9 percent) are located on the uplands, followed by 16.8 percent on the T-0 floodplain and 15.3 percent on the T-1 terrace.

The dimensions of 17 sites, excluding mounds, were studied. Their maximum range was from 10 to 583 m indicating a highly skewed sample. Therefore, the extremes were excluded and a sample mean equal to 104.32 m ± 75.12 m was calculated. These figures suggested that the sites at Milford Lake tend to be large and therefore, a transect interval of 50 m was recommended for subsequent survey.

## Melvern Lake

Considerable archaeological work has been done within the Melvern Lake project area including four federally funded archaeological surveys and three testing and excavation projects. Prior to the 1982 survey, 43 sites had been located on project lands (Table 7). Table 7 is based on a preliminary cultural resource management plan by Aldenderfer (1980) which lists the sites located, their cultural affiliation(s), pertinent references and the level of previous investigation at each site. Additional information on soil type and geomorphic surface has been added for each site. The cultural affiliations are those assigned by the various investigators, while the cultural periods are those assigned during the current investigations.

The initial archaeological survey at Melvern Lake consisted of an archaeological reconnaissance conducted by the Kansas State Historical Society under the direction of Roscoe Wilmeth (1958). The results of this project indicated the presence of nine sites in the project area. The second major project at Melvern Lake was conducted by the University of Kansas in 1962 under the direction of Carlyle S. Smith (Smith and Birkby 1962a, 1962b; Moore and Birkby 1964). Six sites were found and excavations were conducted at 140S1, 140S312 and 140S314. The major focus of these investigations was 140S1 where Archaic, Woodland and Plains Village components were present. Burials and habitation structures dating from the Plains Village component were recovered.

In 1967, additional survey and excavation work in the eastern half of the lake area was conducted by the University of Kansas under the direction of Lawrence Bradley (1968). Fifteen new sites were located with excavations carried out at five of these sites. In most cases, these sites either had Plains Village components or components of unknown cultural affiliation. The fourth survey of Melvern Lake was conducted by Susan B. Traub (1975) and was concentrated on an area between the multi-purpose pool level and the floodpool in the upper reaches of the lake area. Four new sites were discovered during this survey.

The most recent systematic investigation within the Melvern Project area was the discovery and limited excavation at the National Register listed Cow-Killer site (140S347) by the Kansas State Historical Society (Reynolds 1982). The site was discovered during the construction of U.S. Highway 75 and contained an Archaic component characterized by stemmed points and Munkers Creek knives, similar to the Late Archaic component in Unit III at the Coffey site (Schmits 1978). Plains Woodland and Plains Village components were also present at the site. Eight additional sites have been reported since then by members of the Kansas Archaeological Association.

A total of 52 components have been identified at these 46 Melvern Lake sites (Table 8). Sites with questions as to their cultural affiliation have been included within the Unknown Prehistoric category. Components present at Melvern Lake include three dating to the Plains Archaic period, ten to the Plains Woodland Period, 20 to the Plains Village period, two with Historic Aboriginal components and 17 with Unknown Prehistoric components. No site with a definite Paleo-Indian

Table 7. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S1 (Turkey Creek) | Archaic Central Plains | Moore & Birkby 1964 | Surface Collection, Tested | Plains Archaic, Plains Village | Unknown | Lowland |
| 140S2 | Central Plains | Moore & Birkby 1964 Traub 1975 | Surface Collection | Plains Village | Unknown | Lowland |
| 140S3 (Jones) | Central Plains | Moore & Birkby 1964 Bradley 1968 | Surface Collection, Tested | Plains Village | Verdigris | Lowland |
| 140S4 (Hammond) | Unknown | Moore & Birkby 1964 Bradley (1968) | Tested | Unknown Prehistoric | Clareson-Eram | Uplands |
| 140S5 | Territorial/ Reservation | Moore & Birkby 1964 Traub 1975 | Mapped | Historic-Aboriginal | Eram-Lula | Uplands |
| 140S6 | Woodland, Central Plains | KSHS files | Surface Collection | Plains Woodland, Plains Village | Unknown | Lowland |
| 140S16 | Unknown | KSHS files | Surface Collection | Unknown Prehistoric | Osage | Lowland |
| 140S17 | Unknown | KSHS files | Unknown | Unknown Prehistoric | Osage | Lowland |

continued

Table 7 continued. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S19 | Territorial/ Reservation or American Expansion | Bradley 1968 | Surface Collection, Tested | Historic Aboriginal | Unknown | Lowland |
| 140S20 | Central Plains | Bradley 1968 | Surface Collection | Plains Village | Unknown | Lowland |
| 140S21 | Central Plains | Bradley 1968 | Surface Collection, Tested | Plains Village | Unknown | Lowland |
| 140S23 (Litch) | Woodland (?) | Bradley 1968 | Surface Collection, Tested | Unknown Prehistoric | Unknown | Lowland |
| 140S24 | Central Plains | Bradley 1968 | Surface Collection, Tested | Plains Village | Unknown | Lowland |
| 140S25 | Central Plains | Bradley 1968 | Surface Collection, Tested | Plains Village | Unknown | Lowland |

continued

Table 7 continued. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S26 | Woodland | Bradley 1968 | Surface Collection, Tested | Plains Village | Unknown | Lowland |
| 140S27 | Central Plains | Bradley 1968 | Surface Collection, Tested | Plains Village | Unknown | Lowland |
| 140S28 | Central Plains | Bradley 1968 | Surface Collection, Tested (?) | Plains Village | Unknown | Lowland |
| 140S29 | Unknown | Bradley 1968 | Field Survey | Unknown Prehistoric | Unknown | Lowland |
| 140S30 | Unknown | Bradley 1968 | Surface Collection | Unknown Prehistoric | Unknown | Lowland |
| 140S31 | Unknown | Bradley 1968 | Surface Collection | Unknown Prehistoric | Unknown | Lowland |
| 140S32 | Woodland | Bradley 1968 | Surface Collection, Tested | Unknown Prehistoric | Unknown | Lowland |

continued

Table 7 continued. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S33 | Unknown | Bradley 1968 | Field Survey | Unknown Prehistoric | Unknown | Lowland |
| 140S34 | Archaic (?) Woodland (?) | Bradley 1968 | Surface Collection, Tested | Unknown Prehistoric | Unknown | Lowland |
| 140S312 (Wiley) | Plains Archaic, Plains Woodland, Central Plains | Wilmeth 1958 Moore & Birkby 1964 Bradley 1968 | Surface Collection, Tested | Plains Archaic, Plains Woodland, Plains Village | Verdigris | Lowland |
| 140S313 | Unknown | Wilmeth 1958 Moore & Birkby 1964 | Surface Collection | Unknown Prehistoric | Unknown | Lowland |
| 140S314 (Harsch) | Central Plains | Wilmeth 1958 Moore & Birkby 1964 | Surface Collection, Tested | Plains Village | Unknown | Lowland |
| 140S315 | Archaic (?) Woodland, Central Plains | Wilmeth 1958 Moore & Birkby 1964 | Surface Collection | Plains Woodland, Plains Village | Unknown | Lowland |
| 140S317 | Unknown | Wilmeth 1958 Moore & Birkby 1964 | Surface Collection | Unknown Prehistoric | Unknown | Lowland |

continued

Table 7 continued. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S318 | Middle Ceramic, *Pomona Focus* | Wilmeth 1958<br>Moore & Birkby 1964<br>Wilmeth 1970 | Surface | Plains Village | Unknown | Lowland |
| 140S319 | Unknown | Wilmeth 1958 | Surface Collection | Unknown Prehistoric | Unknown | Lowland |
| 140S320 | Unknown | Wilmeth 1958 | Field Survey | Unknown Prehistoric | Unknown | Lowland |
| 140S347 (Cow-Killer) | Archaic, Woodland, Central Plains | Reynolds 1973, 1982 | Tested | Plains Archaic, Plains Woodland, Plains Village | Verdigris | Lowland |
| 140S351 | Woodland (?) Central Plains | Traub 1975 | Surface Collection | Plains Village | Osage | Lowland |
| 140S352 | Unknown | Traub 1975 | Surface Collection | Unknown Prehistoric | Osage | Lowland |
| 140S353 | Woodland (?) Central Plains (?) | Traub 1975 | Surface Collection | Unknown Prehistoric | Osage | Lowland |

continued

Table 7 continued. Previously recorded sites at Melvern Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S354 | Woodland (?) Central Plains (?) | Traub 1975 | Surface Collection | Unknown Prehistoric | Osage | Lowland |
| 140S362 | Woodland | KSHS files | Surface Collection | Plains Woodland | Clareson-Eram | Uplands |
| 140S403 | Woodland | KSHS files | Surface Collection | Plains Woodland | Osage | Lowland |
| 14LY408 | Middle Woodland, Pomona Focus | KSHS files | Surface Collection | Plains Woodland, Plains Village | Unknown | Lowland |
| 14LY410 | Pomona Focus | KSHS files | Surface Collection | Plains Village | Unknown | Lowland |
| 14LY412 | Woodland | KSHS files | Surface Collection | Plains Woodland | Unknown | Lowland |
| 14LY413 | Early Ceramic, Middle Ceramic | KSHS files | Surface Collection | Plains Woodland, Plains Village | Unknown | Lowland |
| 14LY414 | Middle Ceramic | KSHS files | Surface Collection | Plains Village | Unknown | Lowland |

or Euroamerican cultural affiliation had been recorded in the Melvern Lake project area.

Table 8. Distribution of archaeological components at Melvern Lake by geomorphological terrain type.

| | Lowland | Upland | Total | Percent |
|---|---|---|---|---|
| Plains Archaic | 3 | | 3 | 5.6 |
| Plains Woodland | 9 | 1 | 10 | 19.2 |
| Plains Village | 20 | | 20 | 38.5 |
| Historic Aboriginal | 1 | 1 | 2 | 3.8 |
| Unknown Prehistoric | 16 | 1 | 17 | 32.7 |
| TOTAL | 49 | 3 | 52 | 100.0 |
| PERCENT | 94.2 | 5.8 | 100.0 | |

The three Plains Archaic components are all located on the lowlands. Nine of the Plains Woodland components are on the lowlands and one on the uplands. All 20 of the Plains Village period components are located on the lowlands. The 17 sites with Unknown Prehistoric components include 16 on the lowlands and one on the uplands. One of the Historic Aboriginal components is situated on the lowlands and the other is located on the uplands.

The available data prior to the 1982 and 1984 evaluations indicated an overwhelming predominance of lowland locations. Additionally, the data showed relatively heavier usage of the area by Plains Village populations with lesser numbers of Plains Woodland and Plains Archaic occupations. Notable by their absence were sites with Historic Euroamerican components.

In order to determine an appropriate survey interval for Melvern Lake, the site sizes were analyzed. Minimum site dimensions were available for eleven sites (24 percent of the total sites). Site survey forms and reports of investigations were of minimal use for this purpose as the dimensions are generally given in square feet or are not

indicated. Most of these sites were prehistoric habitation sites, although one was a possible burial mound and another a possible historic Sac/Fox house foundation.

The maximum dimension of the eleven sites ranged from 6 to 250 m with an average dimension of 79±70 m. This relatively large standard deviation indicates that a majority of the sites were between 8 and 148 m in maximum dimension. Given this wide range, the average was recalculated after deleting the smallest and the largest sizes. Based on nine site sizes, the average was 64±32 m.

The survey transect interval was based on the average site size and its standard deviation. A transect interval based on mean site size (64 m) would probably miss several sites since relatively broad expanses of land and a thin sinuous shoreline zone were to be surveyed. Therefore, a transect interval based on the standard deviation of 35 m was deemed more appropriate.

## Pomona Lake

Of the three lakes under consideration, Pomona has been the least investigated. The sample of known archaeological sites consists of those discovered during the 1958 Kansas State Historical Society survey (Wilmeth 1958) and five sites that have been reported since then (Table 9).

The original archaeological reconnaissance conducted by Wilmeth (1958) in the Pomona project area recorded ten sites located principally along the floodplain and terraces of Dragoon, 110 Mile and Coon Creeks. Excavations were subsequently conducted by Wilmeth at the Masenthin site (14OS301) and at the Hart site (14OS305) (Wilmeth 1970). The Masenthin site contained Protohistoric burials (cremations) that were thought to represent Sac and Fox occupations of the area. Data from the Hart site, along with information recovered from other sites, led to the definition of the Pomona focus (Witty 1967, Wilmeth 1970). A daub covered structure with a circular postmold pattern was recovered at Hart. Ceramics included cordmarked sherd tempered globular jars. Wilmeth noted a similarity between this site and Smoky Hill sites reported by Wedel (1959).

In the cultural resources management plan for Pomona Lake, Traub (1978) lists an additional five sites (Table 9) that have been reported to the Kansas State Historical Society by Wilmeth and Witty. One of these is probably an historic Sac/Fox grave that may be associated with the Masenthin site, while the other four sites are small habitational sites.

Seventeen components have been identified at the 15 sites in the Pomona Lake project area. The distribution of these components by geomorphic terrain type and by cultural historical period is presented in Table 10. Included are one Plains Archaic component (5.9 percent), four Plains Woodland components (23.5 percent), four Plains Village components (23.5 percent), four Historic Aboriginal components (23.5

Table 9. Previously recorded archaeological sites from Pomona Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S301 (Masenthin) | Historic Sac/Fox | Wilmeth 1958, Wilmeth 1970 | Survey, Excavation | Historic Aboriginal | Summit | Upland |
| 140S302 | Historic Sac/Fox | Wilmeth 1958 | Survey | Historic Aboriginal | Unknown | Lowland |
| 140S303 | Plains Farmer | Wilmeth 1958 | Survey | Plains Village | Unknown | Lowland |
| 140S304 | Unknown | Wilmeth 1958 | Survey | Unknown Prehistoric | Unknown | Lowland |
| 140S305 (Hart) | Pomona Focus Historic American | Wilmeth 1958, Wilmeth 1970 | Survey, Excavation | Plains Village, Historic Euroamerican | Unknown | Lowland |
| 140S306 | Historic Sac/Fox | Wilmeth 1958 | Survey | Historic Aboriginal | Unknown | Lowland |
| 140S308 | Woodland | Wilmeth 1958 | Survey | Plains Woodland | Unknown | Lowland |
| 140S309 | Archaic | Wilmeth 1958 | Survey | Plains Archaic | Unknown | Lowland |
| 140S310 | Unknown | Wilmeth 1958 | Survey | Unknown Prehistoric | Unknown | Lowland |
| 140S311 | Woodland, Plains Farmer | Wilmeth 1958 | Survey | Plains Woodland, Plains Village | Unknown | Lowland |

continued

Table 9 continued. Previously recorded archaeological sites from Pomona Lake.

| SITE NUMBER | CULTURAL AFFILIATION | REFERENCE | LEVEL OF INVESTIGATION | CULTURAL PERIOD | SOIL SERIES | GEOMORPHIC SURFACE |
|---|---|---|---|---|---|---|
| 140S321 | Historic Sac/Fox | KSHS files, Traub 1978 | Survey | Historic Aboriginal | Olpe-Kenoma | Upland |
| 140S329 | Unknown | KSHS files, Traub 1978 | Survey | Unknown Prehistoric | Summit | Upland |
| 140S342 | Early Ceramic | KSHS files, Traub 1978 | Survey | Plains Woodland | Eram-Lula | Upland |
| 140S350 | Early Ceramic | KSHS files, Traub 1978 | Survey | Plains Woodland | Osage | Lowland |
| 140S367 | Middle Ceramic | KSHS files, Traub 1978 | Survey | Plains Village | Summit | Upland |

percent), one Historic Euroamerican component (5.9 percent) and three Unknown Prehistoric components (17.6 percent).

Table 10. Distribution of archaeological components at Pomona Lake by geomorphological terrain type.

| | Lowland | Upland | Total | Percent |
|---|---|---|---|---|
| Plains Archaic | 1 | | 1 | 5.9 |
| Plains Woodland | 3 | 1 | 4 | 23.5 |
| Plains Village | 3 | 1 | 4 | 23.5 |
| Historic Aboriginal | 2 | 2 | 4 | 23.5 |
| Historic Euroamerican | 1 | | 1 | 5.9 |
| Unknown Prehistoric | 2 | 1 | 3 | 17.6 |
| Total | 12 | 5 | 17 | 99.9 |
| Percent | 70.6 | 29.4 | 100.0 | |

The Plains Archaic component is located on the lowlands, while three Plains Woodland components are located on the lowlands and one is on the uplands. Three of the Plains Village components are on the lowlands and one is on the uplands. The Historic Aboriginal components include two occupations on the lowlands and two on the uplands. The Historic Euroamerican site is located on the lowlands. Two of the three Unknown Prehistoric components are located on the lowlands, while one is situated on the uplands.

In summary, the data indicates a preference for lowland locations by all cultural groups. Twelve of the 17 sites (70.6 percent) are located on the lowlands and the remaining five (29.4 percent) are on the uplands.

The range of site sizes was also examined. The seven sites with usable data had a range from 6 to 45 m with an average of 24.2±14.8 m. This wide range is in part attributable to the variability in site function, which ranges from historic aboriginal graves to historic American sites and prehistoric habitation sites. Because of the wide range and small sample, descriptive statistics were not useful for determining the survey interval. Therefore, a 35 m interval was employed based on the data from the similar environmental context at Melvern Lake.

# VI. RESEARCH DESIGN

Larry J. Schmits

## RESEARCH GOALS

The proposed cultural resource inventory and evaluation at Milford, Melvern and Pomona Lakes as required by the U. S. Army Corps of Engineers accomplishes basic management goals (i.e., the identification and evaluation of properties, a preservation plan, and/or mitigation of adverse effects) through a research framework that addresses pertinent regional research problems. The research goals defined for the project have been derived from previous archaeological investigations, geomorphological terrain study, and a review of the current understanding of archaeology in eastern Kansas. The research goals for the Milford, Melvern and Pomona survey can be divided into three major problem domains: (1) refinement of the culture history of the project area; (2) delineation of settlement-subsistence patterns, and (3) formulation of a predictive model for site distribution in the project areas.

### Culture History

Previous archaeological work in the three project areas and in eastern Kansas in general has produced evidence of numerous sites dating to the Late Archaic, Plains Woodland and Plains Village Tradition periods. Little or no evidence of occupation of the area for the Paleo-Indian, Early Archaic or Middle Archaic periods has been documented. Sites dating to these earlier periods are common in areas of the High Plains to the west (Frison 1978) and to the east in Missouri (Chapman 1975). Data is badly needed to determine whether this skewed distribution of sites represents minimal occupation of the area during these earlier periods, biases as a result of previous survey methods or the result of recent geomorphological processes. Consequently, one major goal of the project was to locate Paleo-Indian, Early and Middle Archaic sites.

Many culture history questions remain concerning the later Plains Woodland and Plains Village occupations of the area. While numerous sites can be assigned to these broader periods, it is rarely possible to assign the sites in question to particular phases or prehistoric cultural units. A number of Woodland phases have been proposed for eastern Kansas including the Keith focus, the Grasshopper Falls phase, and the Greenwood phase (Reynolds 1979). Work was needed to clarify the temporal position and social relationship between these complexes in eastern Kansas.

The cultural historical position and affiliation of many Plains Village Tradition sites is equally ambiguous. Most sites in the Pomona and Melvern Lake areas have been assigned to the Pomona focus (Aldenderfer 1980), while sites in the Milford Lake area have been assigned to the Smoky Hill and Upper Republican phases (O'Brien 1978). Wedel (1959:629) suggested the possible

transition from Smoky Hill to Upper Republican. Witty (1978) has suggested that the Pomona focus represents a development from earlier Plains Woodland patterns in eastern Kansas, such as Grasshopper Falls and Greenwood phases. These hypotheses need to be evaluated in the light of current information. The relationship between Pomona sites and Smoky Hill sites also needed to be assessed.

The Republican band of the Pawnee ranged over the Milford Lake area in the Historic Period. Grange (1979) has recently noted that the Pawnee can be linked with the Protohistoric Lower Loup phase. The Lower Loup phase may be subdivided into geographically localized groups representing forerunners of the historic Pawnee bands. Grange notes that while general links to certain Central Plains Tradition assemblages have been identified, other Central Plains assemblages could prove to be significant. Protohistoric sites at Milford may have an important bearing on the development of the Pawnee. Roberts (1978) has concluded that a temporal gap exists between the Pawnee Kansas Monument site and Bogan site located on the Republican drainage. The location of additional Historic Pawnee sites may well fall within this hiatus.

Early Historic records indicate a lack of occupation of the Pomona and Melvern project areas prior to movement of Kansa Indians into the region in the early nineteenth century. Dates from some Pomona focus sites range from 1550-1600 A.D. suggesting that Plains Village Tradition cultures survived into the Protohistoric periods (Schmits et al. 1980). A question arises concerning the identity of these cultural units during the Protohistoric and their identity by the advent of the Historic Period. The aboriginal inhabitants of this area during the Historic periods were the immigrant Sac and Fox. These groups were in the process of being acculturated into Euroamerican society. Little data is presently available regarding the material aspects of Sac and Fox life. Wilmeth (1970) noted that the Sac and Fox graves at the Masenthin site were atypical for historically recorded graves of the Sac and Fox.

In summary, the archaeological record in eastern Kansas appears to reflect an indigenous development from a series of Plains Woodland cultures to Plains Village to historically known tribes or cultures. Explication of such a sequence would be extremely important in answering questions concerning culture change and process.

## Settlement-Subsistence Patterns

While substantial data are available regarding the later segments of the culture history of the project areas, little information has been put forth regarding settlement-subsistence patterns. The survey of a number of microenvironments within the project lands would provide information regarding the distribution of sites in the project area.

Data from investigated Archaic sites such as Snyder (Grosser 1973, 1977), Williamson (Schmits 1980b) and Coffey (Schmits 1978, 1980a, 1981) indicate that these sites are invariably located in low depressional areas of the floodplain which are subjected to seasonal inundation. In so far as can be determined, these sites appear to have been dry season extractive camps occupied by hunter-gatherers during the late summer and fall. The question that presents itself is where were sites located during other seasons, such as

during the winter or during the spring and early summer when the lowlands were inundated by flooding.

Work to the east in the Kansas City area on the Nebo Hill settlement-subsistence pattern (Reid 1980, Reeder 1980) indicates the presence of dichotomous lowland (interpreted to be winter) and upland (interpreted as warm weather) occupations. Such a dichotomous topographic positioning of settlements could hold for eastern Kansas as well. Little survey work of the uplands in the project areas of Milford, Pomona and Melvern Lakes has been conducted. It is not presently known whether upland Archaic sites are present in the Melvern and Pomona areas. The survey of the Milford, Melvern and Pomona project areas, which includes lowland floodplain areas, slopes and upland topography, presents an opportunity to determine the full range of locations used for Archaic settlements. The results of the Milford, Melvern and Pomona survey can be expected to provide important information regarding Archaic settlement-subsistence patterns in eastern Kansas and how these patterns compare with adjacent areas, such as western Missouri.

The Woodland period in eastern Kansas includes two major cultural traditions. Hopewell occupations, found in the eastern part of the state, are characterized by artifact styles similar to those found in the Kansas City and central Missouri areas to the east. This cultural manifestation appears to be the result of the westward migration of Hopewellian populations from the Illinois River valley (Johnson 1976). The second and more widespread Woodland cultural tradition is referred to as Plains Woodland. In the eastern part of Kansas, Plains Woodland groups include Grasshopper Falls, Greenwood and Cuesta phases. Plains Woodland groups likely represent a continuity with the earlier Archaic groups.

For the most part, explicit statements regarding settlement patterns have been made only for areas adjacent to eastern Kansas, although Reynolds (1979:73) has characterized the settlement pattern for the Grasshopper Falls Phase as consisting of small isolated clusters of nuclear households or individual nuclear households occupying terraces adjacent to secondary drainages. He states that a sedentary lifestyle is indicated with at least part-time residence each year in domestic houses of some permanence. Henry (1979:59) has suggested a less sedentary settlement pattern for Plains Woodland populations to the south in the Hominy Creek valley of north central Oklahoma. He characterizes this pattern as a centrally based circulating pattern with small social groups present during summer/autumn and large group aggregation during other seasons.

To the east in the Kansas City area, Johnson (1976) has suggested that Kansas City Hopewell settlement patterns consisted of large permanently occupied villages located near the mouths of tributaries of the Missouri River and small ancillary camps located upstream in the tributaries. Whether a similar settlement pattern holds for Hopewell tradition populations in eastern Kansas has not been investigated. Information recovered from the survey of Milford, Melvern and Pomona Lakes should provide empirical data regarding Woodland settlement patterns in eastern Kansas, including the degree of sedentism among Plains Woodland populations.

Plains Village Tradition sites have been more intensively investigated in the project areas, although again few explicit statements have been made

regarding settlement patterns. Wedel (n.d., cited in Lippincott 1978) has stated that Upper Republican settlement patterns within the Solomon River valley are sometimes situated on larger streams, but more often are located on tributaries convenient to arable lands, water, wood and perhaps to sources of lithic materials. Lippincott (1978:82) further notes that Upper Republican sites in the Solomon River include small hamlets, isolated households and seasonal campsites. Witty (1963) has noted that Plains Village populations at the Woods and Streeter sites near Milford were located in small tributary stream valleys.

In the Pomona Lake area, Plains Village Tradition Pomona focus sites are located on the floodplain of One Hundred and Ten Mile Creek near the dam axis (Wilmeth 1970). The Harsh site, a Pomona site in the Melvern Lake area, was located on the floodplain of Stevens Creek, a tributary of the Marais des Cygnes (Moore and Birkby 1964). Dead Hickory Tree, a Plains Village site in John Redmond Reservoir, was located on the floodplain of the Neosho River (Schmits et al. 1980). To the east on the Little Blue drainage in Jackson County, Missouri, May Brook phase Plains Village sites are located in low depressional areas of the floodplain and appear to represent late summer and fall extractive camps rather than sites occupied over a long period (Schmits 1980d). Further information is required regarding the range of Plains Village settlement patterns in eastern Kansas. In particular, a determination of whether the sites were occupied on a year round or seasonal basis is needed.

In summary, the survey of Milford, Melvern and Pomona Lake areas can be expected to provide empirical data regarding Archaic, Woodland and Plains Village settlement patterns in eastern Kansas. Specific questions that will be addressed include Archaic hunter-gatherer adaptation to upland and floodplain depressional environments, the relative degree of sedentism represented by Plains Woodland sites and finally, the range of Plains Village settlement types.

Microenvironments present in the project areas can be defined largely on the basis of topographic and vegetational cover. At Milford, the project areas to be surveyed include floodplains, valley slopes and limited amounts of uplands. Prehistorically, the floodplain would have included wetland, floodplain prairie and riparian forest communities. A hillside breaks community would have been present on the slopes, especially along limestone outcroppings. The uplands would have been covered by an upland prairie community. Similar microenvironments would be present in the Pomona and Melvern project areas. Slope oak-hickory and upland forests would be more extensive, however, with the hillside breaks community absent and the riparian forest community more extensive.

It must be recognized that the presence of microenvironments played an important part in structuring prehistoric settlement-subsistence patterns. The availability of resources varies from one microenvironment to the next and within each microenvironment from one season to the next. Low depressional wetland communities contain a large number of edible annual weedy seed-producing plants during the summer and fall, such as chenopods and ammaranths. In the uplands, floral resources such as tubers are generally available in the spring. Similar variations exist in the distribution of animal species: antelope and bison are located in the uplands while deer are found in the riparian forest community.

Prehistoric peoples dependent on these plant and animal species would have been sensitive to these variations and would have adjusted their exploitative patterns accordingly. However, the role of microenvironments in the settlement-subsistence patterns of eastern Kansas is not fully understood. The data which accrues during the Milford, Melvern and Pomona survey will contribute towards an elucidation of these relationships.

### Predictive Model

The development of predictive models has become a focal point in cultural resource management. Aldenderfer and Bezsylko (1981:21) have noted that the most reliable predictive models are those based on well-structured, comprehensive sampling strategies designed to provide quantitative estimates of site distribution in reference to a postulated settlement pattern. Predictive statements can then be made about location, site type and assemblage content for a given environment. One of the objectives of the project was to locate, record and evaluate the cultural resources of the project area and to develop a predictive model of archaeological sensitivity for the project area based on the known site distribution.

The results of the geomorphological terrain analysis along with the study of settlement-subsistence systems provide two major sources of information for the development of the predictive model. First, the delineation of the terrace sequence and alluvial chronology provides information regarding the age of the alluvial sediments. This information indicates the parameters for the location of sites of various ages on the floodplain. For example, Plains Village Tradition sites might be located on the T-0 floodplain. Late Archaic sites might be buried on the T-1 terrace fill or located on the surface of higher terraces. We might find that earlier Archaic sites are deeply buried in the T-1 terrace fill, or conversely we might find that various valleys were scoured out during the early Holocene. If the latter, Early Archaic sites would be preserved only on the uplands.

## FIELD AND LABORATORY METHODS

The archaeological survey and site testing program at Melvern, Milford and Pomona Lakes was designed to achieve a set of cultural resource management and research goals. The following discussion focuses on the field and laboratory methods designed to provide the necessary data to address the research goals discussed above.

### Field Survey and Testing

The field investigative procedures at the three lakes consisted of transect sampling and testing of located sites. Transect sampling is a pedestrian field survey technique in which the surveyor traverses an area along a previously selected route while maintaining a constant distance between himself and other members of the survey crew (Chartkoff and Chartkoff

1980). The transect routes can be linear or curvilinear. Intervals between transects for the surveys at Melvern, Milford and Pomona Lakes were derived from an analysis of site sizes. At Melvern and Pomona, the intervals were 35 m; at Milford, they were 50 m. Data regarding the date, transect designation, transect orientation, transect dimensions, environmental data, drainage systems, ground visibility and vegetation were recorded for each of the surveys.

The survey staff consisted of two two man teams. One crew conducted the survey and testing at Melvern and Pomona Lake project areas and the second crew covered the Milford project area. Each team consisted of a Project Archaeologist and a Survey Archaeologist. The site testing was conducted by a four man team headed by the Project Archaeologist. The two man survey crew was considered optimal in terms of logistics for the narrow parallel shoreline transects, while the four man testing team was considered optimal for the more intensive test excavations.

The surfaces of sites located were sketch mapped and collected during the testing phase. Planimetric maps tying the site to topographic contours and more permanent natural/cultural features (such as bridges, fencelines, road intersections, houses, utility lines, etc.) were made with a transit or alidade. Information was recorded so that sites could easily be located on U.S. Army Corps of Engineers real estate tract maps. Collection techniques varied according to the size of the site and the density of cultural material present. Small sites with little cultural debris were intesively collected; large sites with a great amount of debris on the surface were sampled for diagnostic artifact types. After the site located during the survey the periphery of the site was flagged and a temporary datum established and diagnostic artifacts (at the minimum) collected. The site was then located U.S.G.S. 7.5 minute quadrangle maps.

Test excavations were performed, where warranted, at prehistoric and historic sites located within the project areas. The primary objective of the testing was to produce sufficient data to make a determination of eligibility for the National Register of Historic Places for the property in question. The primary types of data sought during the testing phase were: (1) horizontal and vertical extent of the site, (2) data which would establish the nature, density and cultural affiliation of the occupation, and (3) information useful for formulating a mitigation plan.

Testing required the establishment of a permanent datum marker with all collected materials, subsurface tests, etc., located and plotted on a topographic map, which indicated the directional orientation of the materials, tests, etc., in relation to the datum. Shovel tests were the most common test procedure used in determining the horizontal limits of sites.

One by one meter test excavation units were used to determine the vertical limits of sites and to obtain samples of diagnostic artifacts and organics suitable for dating. The number of test units placed at any given site was dependent upon site size and condition, although the scope of work limited the number of test units in any given site to 16 square meters. It was found that test units placed at 25 m intervals provided excellent coverage for most sites. Test units were placed on sites where (1) shovel tests and soil cores were unable to determine the depth and/or horizontal extent of

buried deposits, and (2) where additional knowledge of site integrity and content was necessary to evaluate the site's eligibility for the National Register.

All tools recovered in each unit were piece plotted to the nearest cm. In addition, level summary forms were completed for each excavation level in each test unit. Excavation levels were normally 10 cm in depth. Data recorded for each level included the site number, excavation unit, depth, excavation techniques, description of soils and stratigraphy, artifacts recovered, features present, as well as special samples and photographs taken. Profiles were also recorded for each test unit. The recovered material was bagged and recorded by level and unit. All test units were backfilled.

In addition to the field methodology discussed above, the testing of historic sites involved documentary research including examination of land records, histories, atlases, etc. These records provided information regarding the identity of the historic properties in question, as well as data with which to assess the significance of each property. The field methodology for historic sites did not deviate substantially from the procedures used on prehistoric sites. However, there was greater potential for historic properties to contain structures such as foundations, monuments, etc, which required detailed mapping and recordation in some instances, rather than test excavation.

## Laboratory Methods

The assemblages recovered from the sites were initially sorted into raw material categories such as ceramics, chipped stone, ground stone, unworked stone and other classes of debris. Chipped stone tools and lithic debitage constitute the largest class of artifacts found on most of the sites. In many cases, these tools and associated debris make up the entire site inventory. Classification is important in organizing this data set and in providing a body of information from which inferences regarding cultural history and settlement-subsistence patterns can be made. In practice, an infinite number of classifications are possible depending upon the type of data being sought. In the present study, the primary types of information desired include the chronological placement and identification of functional activities that took place at the site in question. This information is often important in establishing the cultural affiliation of a site and in determining its role in prehistoric settlement-subsistence patterns. At the same time, it is important that a classificatory scheme be a comprehensive descriptive device in order to fully document the technological variability in a prehistoric assemblage.

## Lithic Analysis

With the above objectives in mind, the classificatory scheme used here combined elements of many techno-morphological and functional classificatory procedures. A principal objective of the approach was to develop a system which would provide data regarding the use of lithic implements and at the same time permit the rapid classification necessary in a CRM project. The

method developed here is a modified version of the analytical system developed by Chapman (1977).

The initial procedure was a technological subdivision of the assemblage into categories based on the presence or absence and type of edge retouch present (Chapman 1977). Retouch can be separated into two general categories defined by the length of retouch scars relative to the surface area upon which they are visible. If the scars extend from the perimeter of the edge over one-third or more of the dorsal or ventral surface of the tool, then the retouch is termed facial or invasive retouch (Figure 5a-b). If the retouch scars extend from the edge perimeter over less than one third of either surface, then it is termed marginal retouch (Figure 5c). Facial retouch observable on only one surface of debitage is termed unifacial retouch (Figure 5b). Facial retouch observed on both the ventral and dorsal surfaces of debitage is termed bifacial retouch (Figure 5a). Facial retouch, whether bifacial or unifacial, results in considerable alteration of the morphology of a piece of debitage. It is assumed to have been undertaken in the context of the manufacture of tools for use in specific contexts.

Within these two categories of facially retouched tools, a number of functional tool classes can be recognized on the basis of morphology (shape), placement of working edge, edge shape and evidence of edge damage or wear. These attributes serve to identify broad functional tool categories which can then be associated with a specific prehistoric activity. Many tools, such as a biface, could easily go through several stages of utilization beginning as a blank, then being used as a knife and then as a projectile point preform. The classification of a tool is generally dependent upon the stage at which it enters the archaeological record.

A second problem encountered is that many tools indicate multiple functional uses, such as cutting wear on projectile points or knife wear on scrapers. Classification of multifunctional tools can be approached in several ways. On cultural resource management projects such as the present one where collections must be rapidly processed, it is often most efficient to assign the tool to its principal functional class, based on the overall morphology of the tool. In this case, a projectile point with secondary evidence of knife wear would still be classified as a point.

Edge Shape and Wear Patterns

Many attributes of edge shape are informative about the function of the tool edge. In general, beveled edge shapes asymmetric to the horizontal plane or maximum projection of the tool are termed planoclinal and can be associated with scraping use while thin symmetric "biclinical edges" can be associated with use as a cutting tool (Isaac 1977).

A projection is essentially a "pointed" edge which projects outward from the perimeter of a piece of debitage (Figure 5g). Projections may be simply utilized junctures where two portions of the perimeter meet in an acute angle, or they may be manufactured through retouching. Projections exhibit variability in outline which can be classified according to the shape of the distal end of the projection shaft, or tip. Some projections terminate in a pointed tip, while others end in a rounded tip.

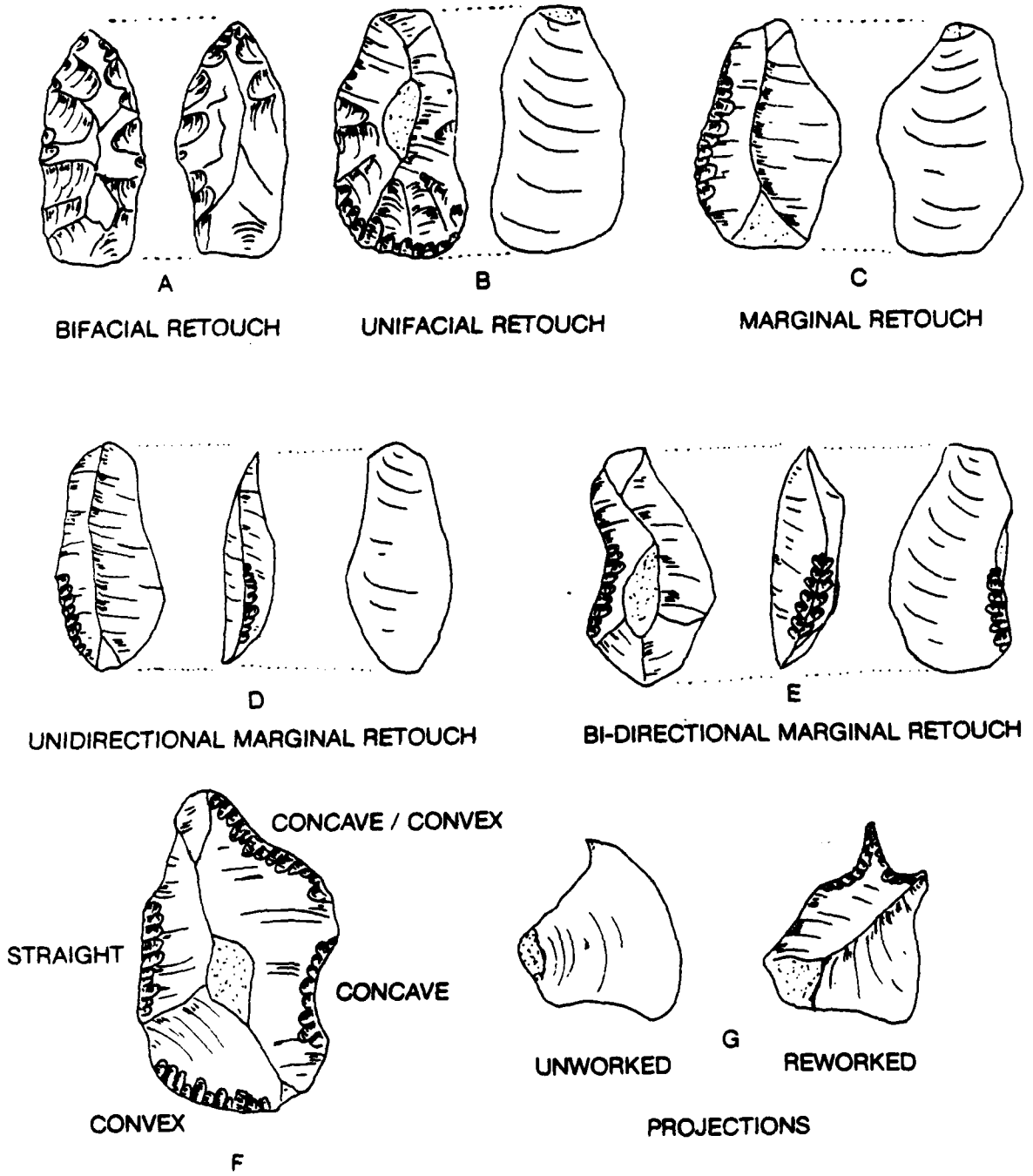



Figure 5. Lithic terminology used in the study.

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Several morphological attributes of nonprojecting edges were monitored nominally especially for informal flake tools. The utilized or retouched portions of debitage perimeters, when viewed with respect to the long axis of the edge, are classified as concave, straight, convex, or concave-convex (Figure 5f).

Wear patterns are defined as observable alterations of some portion of an artifact which has apparently occurred through utilization of that artifact as a tool (Chapman 1977). This alteration is generally observable under magnification as a range of different patterns of microfracture -- the result of force having been applied to some portion of the artifact edge during its use. Wear patterns defined in this analysis are very gross in nature and those which can be defined will be of low level magnification. In general, four classes were recognized: step fracture, attrition, polish and battering.

Step Fracture: Step fractures are the negative scars of microscopic pieces of debitage which have been removed from one surface of an edge as the edge was used in a scraping fashion. The angle at which the force was applied through this type of usage, results in pieces of debitage terminating abruptly in "hinges" rather than feathering outward from their proximal ends. The negative scars removed in this fashion are observed as a series of small hinge fractures of "steps" situated on one surface quite near the perimeter of the utilized portion of an artifact (Chapman 1977).

Step fracture is commonly the result of a "scraping" movement in which the edge is held on a surface of some material and moved in a direction perpendicular to the long axis of the edge while pressure is being exerted downward. In these cases, step fractures do occur singly and are generally observed as a clustering of many small steep fractures situated close together at different distances from the edge perimeter. Occasionally, step fractures may be observed which are at a diagonal to the long axis of the edge. These are produced through use of the edge in a motion parallel to the long axis of the edge, and are nearly always found in association with attrition of the edge perimeter.

Attrition: Attrition is a wear pattern observed on the edge perimeter itself, unlike step fracture which is found on surfaces adjacent to the edge perimeter. Attrition is produced by holding an edge perpendicular to some material and using the edge in a "sawing" motion while exerting pressure downward (Chapman 1977). This use of the edge in a direction parallel to its long axis occasionally results in the occurrence of a few step fractures on either surface adjacent to the perimeter which are oriented diagonally to the long axis of the edge rather than parallel to it.

Attritioned edge perimeters are evenly rounded from the juncture of the two edge perimeters toward both surfaces, and the rounded portions of the edge often exhibit pitting. Slightly rounded edge perimeters can be observed in conjunction with step fractures produced through scraping use, but, in these cases, the rounding occurs only from the ventral/dorsal juncture of the edge perimeter toward the surface upon which the step fractures are evident, giving the edge a beveled appearance in cross-section. The pitting characteristic of attritional wear is not observed in these cases.

Attrition has been produced experimentally on edges of silicious stone artifacts by Ahler (1971:82-85) through wood sawing, disjointing, bone whittling, bone sawing, and, to a lesser extent, through meat slicing. Ahler terms this wear pattern as "edge blunting". Experiments with both retouched and unretouched debitage perimeters have reduplicated attritional wear by using edge perimeters in a sawing motion upon both wood and bone (Chapman 1977).

Polish: Polish is a sheen or mirror-like surface exhibited by both the edge perimeter and portions of the surfaces adjacent to the edge perimeter. Witthoft (1967) has differentiated polish produced by abrasion from polish produced through accretion of opal. The latter results from heat generated through usage of the edge in cutting grass-like vegetal materials.

Polish is one of the more difficult wear patterns to identify because of the glassy nature of many silicious chipped stone materials. Ahler (1971:82-86) reproduced slight to moderate polish on some tools in the context of wood whittling and imbedding hafted projectile points into silty topsoil. Polish of the abrasive kind has been observed on a great variety of artifacts recovered from a great variety of archaeological contexts. Pronounced, or heavy polish, is often observed to occur in conjunction with striation, which is indicative of abrasion rather than opal accretion.

Battering: Battering, as a category of wear on silicious materials, is characterized by conchoidal fractures resulting from impact. Battering can be observed microscopically as a concentration of concoidal fractures upon a portion of the artifacts. These fractures appear as small white rings 0.5-1.5 mm in diameter. Under microscopic examination, the ring is a small conical fracture extending outward from its center at the surface into the body of material. Individual fractures of this sort are produced through impact of that portion of the artifact upon, or by, some other material. Repeated usage of the artifact results in a concentration of overlapping fractures of this sort. Quite often, such repeated use eventually results in fragmentation of the surface, giving the surface a distinctly "roughened" appearance. Battering wear is employed as a criterion to distinguish from hammering usage exhibited on other categories of artifacts, such as cores.

Chipped Stone Tool Classification

Bifacial Tools. Bifacial tools exhibit primary invasive flaking on two surfaces (Figure 5a). Primary flaking is the removal of large thinning and shaping flakes which significantly alter the outline or cross-section of the tool. Within the general category of biface, there are several functional classes separated on the basis of morphology and evidence of utilization.

Projectile points are symmetrical bifaces with laterally convergent edges that form a distal point and which have a proximal haft element. They are generally considered to be primarily designed to serve as the tip of a projectile. However, this may not always be the case. At Rodgers Shelter, Ahler (1971) has found that tools generally classified as projectile points exhibited wear patterns indicative of other usages.

Haft element modifications can consist of side or corner notches, a basal stem or shoulder, or thinning of the base by removal of one or more large

flakes. The presence of such modification indicates that the artifact was intended to be mounted on the end of a shaft for use as a piercing tool. However, some bifacial tools which do not exhibit definite hafting modifications, but whose size, outline and edge characteristics preclude most other uses, are traditionally classified as projectile points. Small, symmetrical, triangular bifaces with or without hafting modification, whose distal margins converge to a point are referred to as arrow points. Generally, only projectile points sufficiently complete for typological classification will be discussed as projectile points.

Bifacial knives are thinned, unstemmed bifaces whose morphology and wear patterns indicate use as a cutting tool. A bifacial knife is generally a triangular or ovate light-duty biface with at least one edge which exhibits attritional wear. It should be recognized that such wear can result from platform preparation or fine retouching, as well as from cutting utilization and so, may not indicate use as a knife. The presence of wear is generally considered necessary to make a functional interpretation, although detailed wear pattern analysis is generally not necessary.

Bifacial blanks are bifaces which exhibit no readily identifiable wear patterns and thus are not functionally assignable. These can include unfinished tools and tools broken during manufacture, or bifaces which are discarded due to flaws in the raw material. Blanks also subsume the heading of preforms, or tools intended for later reduction into points or knives.

Bifacial scrapers are classified on the basis of the presence of a steep marginal retouch and wear indicative of use as a scraping tool. Many bifacial scrapers appear to be secondarily utilized as scrapers and do not appear to have been manufactured primarily for use as a scraper. Generally, only a small portion of the potential working edge available was utilized as a scraper.

Unifacial Tools. Unifacial tools exhibit primary facial modification on only one suirface (Figure 5b). The other surface is unmodified or only marginally modified. Such retouch generally produces substantial modification in the form of a piece of debitage and is directed towards the production of predetermined characteristics. The majority of unifacially modified tools are end scrapers. These tools possess ovoid to subtriangular outlines with a steeply angled, excurvate working edge at one end and facial flaking over most of the dorsal surface of the flake. They are generally considered to be hideworking tools.

Marginally Retouched Tools. Tools with subinvasive retouch are classified as marginally retouched when the retouch extends along more than one third of the perimeter of the tool. Marginally retouched tools include flake scrapers and perforators. Flake scrapers are characterized by a steep angle of retouch, while perforators are characterized by a projection suitable for piercing.

Edge-Modified Tools. These tools make up the majority of the artifacts from many sites. Edge-modified debitage are informal implements which exhibit marginal retouch in the form of deliberate flaking along one or more edge. This modification generally extends over less than one third of the perimeter of the artifact and is generally confined to from 1-5 mm along the tool margin. These tools are usually subdivided into debitage categories such as

edge-modified flakes or edge-modified chunks. Such tools will generally see one episode of use and will rarely be curated or maintained.

Lithic Manufacturing Debris

Lithic manufacturing debris comprises the majority of the assemblages recovered from investigated sites. Initially, this material was subdivided by techno-morphological attributes into cores, chunks and debitage. In some cases cores, chunks and debitage were subdivided into more specific categories characterizing the nature of the lithic assemblage and providing a more detailed analysis of the stages of lithic tool manufacture conducted at the sites. Definitions of classes of lithic manufacturing debris are presented below.

Cores. Cores consist of pieces of chert which exhibit patterned negative flake scars from which flakes were removed by direct or indirect percussion. Within the general category of core, several morphological classes are recognized based on the size, shape, degree of platform preparation and flake scar patterning observed.

Block cores are large pieces of chert which are irregular in shape and exhibit one or more natural striking platforms. They are distinguished by their large size and a thickness which is at least one half or greater than the largest dimension. Flake removal entails the detachment of large expanding flakes with minimal platform preparation. Tabular cores differ from block cores in that their thickness is one half or less than the maximum dimension. They differ morphologically as well in that they are more quadrilateral in cross-section. Like the block cores, tabular cores exhibit minimally prepared natural striking platforms from which large expanding flakes were detached. Nodular cores are naturally eliptical pieces of chert. Although generally smaller than block or tabular cores, they also exhibit an expanding flake pattern and minimally prepared, natural striking platforms. Prepared cores exhibit systematic platform preparation for the removal of lamellar or parallel edged flakes. They tend to by pyramidal in shape where flakes have been removed. These differ from true blade cores in that the negative flake scars tend to be less parallel-sided and not as elongated. Core nuclei are worn out or exhausted pieces of chert which exhibit negative flake scars. Given the small size and degree of reduction, it is not possible to determine whether they were derived from any of the types described above. Core fragments are pieces of chert that exhibit evidence of both systematic flake removal and natural, angular cleavage planes. As opposed to the other types described above, these specimens are amorphously shaped and are probably sections of larger block cores or tabular cores that prematurely fractured along pre-existing planes.

Chunks. Chunks consist of angular multifaceted pieces of chert greater than 3 cm in maximum dimension. They exhibit none of the systematic flake removal associated with cores nor any of the morphological characteristics of flakes. Most represent trimming elements removed during the initial reduction of a core or material that was discarded as a waste by-product during lithic manufacture. Cortical chunks are simply chunks that exhibit one or more cortical surfaces.

Debitage. Debitage consists of generalized waste flakes and shatter detached by direct or indirect pressure or percussion during the reduction of cores and

manufacture of chipped stone tools. They exhibit no evidence of postdetachment modification such as intentional retouch or utilization.

Flakes are recognized by the morphological characteristics of striking platforms, bulbs of percussion and ripple marks. This category includes decortication flakes, intermediate flakes, bifacial trimming flakes and chips. Decortication flakes have a minimum dimension of 2 cm and exhibit at least 50 percent cortex on their dorsal surfaces. They represent the intermediate stages of lithic reduction and tool manufacture and include secondary decortication flakes as well as primary and secondary trimming flakes. Bifacial trimming flakes are recognized by the presence of multifaceted platforms which exhibit characteristic 'lipping' of the striking platform over the vertical surface of the flake. These elements are very thin and possess small negative flake scars in their dorsal surface. Bifacial trimming flakes are representative of the final stage of lithic tool manufacture and maintenance. Chips are flakes less than 2 cm in maximum dimension.

Small pieces of chert less than 3 cm in maximum dimension that are irregular in shape and lack characteristics of flakes are classified as shatter. Shatter does not bear evidence of conchoidal fracture. It may have resulted from breakage along the chert's natural cleavage planes, excess force applied during lithic reduction, heat treatment, treadage or noncultural factors such as freeze-thaw action. It is possible that some of the shatter actually represents unidentifiable flake fragments.

## DETERMINATION OF NATIONAL REGISTER ELIGIBILITY

Cultural resources are scarce, nonrenewable components of the environment which are being destroyed rapidly through urban, industrial, agricultural, and natural processes. The economic demands resulting from population expansion have accelerated the rate of destruction for these resources to an unprecedented level during the 20th Century. A growing realization that many of the physical and intangible reminders of the past were apt to be lost forever led to promulgation of statutes at the Federal, state and local level to help insure the preservation or conservation of cultural resources.

The centerpiece of Federal preservation legislation is the National Historic Preservation Act of 1966, as amended by P. L. 96-515. As set forth in that statute, inclusion on the National Register of Historic Places provides protective legislation for a cultural property. The criteria which determine
whether a property is eligible for the National Register are set forth in 36 C.F.R. 60.6:

> National Register criteria for evaluation. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or

(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distiguishable entity whose components may lack individual distinction; or

(d) That have yielded, or may be likely to yield, information important in prehistory or history.

These criteria set forth in a precise manner the substance of what is termed "legal significance" (Schiffer and Gumerman 1977:245). To state the situation concisely, if a property is adjudged to meet one or more of the above criteria, it is eligible for inclusion in the National Register (i.e., it is a significant property) and therefore falls under the provenience of Federal cultural resource protection statutes. However, a determination of "significance" cannot be as simply and summarily assessed as the Federal Regulations seem to imply.

Because the Federal statutes which govern most cultural resource management projects revolve around determinations of significance and National Register eligibility, a substantial amount of literature is developing that explore these concepts (Dixon 1977; Glassow 1977; McGimsey 1979; Raab and Klinger 1977 and 1979; Schiffer and House 1977a and 1977b; Scovill et al. 1972; Sharrock and Grayson 1979; and Wendorf 1978). Within cultural resources management, "significance" is recognized as a fluid concept, one which must be malleable in order to meet the myriad of diverse situations that arise. What is "significant" varies from area to area and through time as research interests change. Promulgation of state and regional research designs, which are authorized by the National Historic Preservation Act of 1966, would provide a groundwork for determinations of significance but not a complete solution. Archaeologists have to make the necessary determinations on the basis of what is already known, possible future developments, existing research designs, comparisons, and with the best overall professional judgement. This is the archaeologist's primary responsibility.

Determination of eligibility for archaeological resources are generally made using Criterion D. The most widely accepted and commonly employed means of making determinations under this criterion, is to assess a site's potential to contribute new or substantial data towards the resolution of one or more research questions. Which research questions are important in making determinations of significance are occasionally enumerated by professional organizations or by the state or federal agency charged with responsibility for cultural resources. In this instance, a series of research topics will be set forth in the project's research design. These topics reflect the investigator's understanding of the current state of knowledge in the project area's region.

In making recommendations for the sites encountered during the Milford, Melvern, and Pomona survey four basic criteria were utilized. These were: (1) physical condition of the site, (2) the site content, (3) its relationship to regional research questions, and (4) the expected impact on the site. The first three will be used to evaluate the potential of the site in answering questions pertinent to the archaeology of the region and the fourth will be used in the process of making recommendations for mitigation, if required.

Site condition is based on the amount and nature of postdepositional disturbance. Factors such as plowing, construction activities, road building and natural erosion will be taken into account. The site content is based on the archaeological features or remains which have been recorded or which can be expected to be present, given the erosional and depositional conditions at the site. Included in the site content are such things as the presence or absence of a surface distribution, preservation of subsurface cultural deposits or features and the likelihood of recovering datable carbon, faunal or botanical remains or diagnostic artifacts. These factors and others will be examined to determine which materials a future researcher might have to work with in further evaluation of the site. The knowledge gained about the particular site will then be examined in relation to the present knowledge about the region with regard to its potential for improving the data base regarding past human events in the area.

These three major factors taken together were used in making a judgement as to the relative significance of a particular site. In the case of a site judged not significant, no further work will be recommended. This does not mean the site is of no interest as an archaeological manifestation, but rather that work would be unlikely to increase the data base beyond that acquired in survey and testing. Destruction of these sites will, therefore, not seriously affect the data base for the region.

In the case of a site that was judged to be significant, there are a limited number of options for mitigation. The preferred option is preservation (Wendorf 1978, King 1975, Lipe 1974) and in cases where this appears feasible, it will be recommended. Preservation can include anything from simply withholding site location information to active protection of the site dependent on the anticipated utilization of the area. The other option, in cases where planned activities will destroy or seriously endanger the site, is data recovery by excavation. The form this excavation will take is up to the investigator and is dependent on the nature of the site and the research questions to be addressed. It could range from a controlled surface collection to a major block excavation. The orientations and knowledge of future researchers must guide the final mitigation plans.

# VII. SURVEY AND TESTING AT MILFORD LAKE

James A. Donohue, Donald E. Weston and Alan F. Arbogast

## INTRODUCTION

Milford Lake is located on the Republican River, approximately ten miles above its confluence with the Smoky Hill River (Figure 1). The project was initially authorized in 1938, reauthorized in 1954 and completed for operation in 1965. The project drains 3620 square miles downstream from Harlan County Lake in south central Nebraska. The dam is a rolled earthfilled structure 6300 ft (1920 m) long and 140 ft (43 m) high. The multipurpose pool inundates 16,000 ac at an elevation of 1144.4 ft above msl, which expands to 33,000 ac at full floodpool at an elevation of 1176.2 ft above msl. The multipurpose pool has a shoreline 163 miles (262 km) in length. Milford Dam is situated approximately four miles northwest of Junction City, Kansas and 131 miles west of Kansas City, Missouri.

An intensive cultural resources survey of 4178 ac (1692 ha) or 25 percent of the project lands at Milford leased to the Kansas Fish and Game Commission was conducted by ESA in the summer of 1982. The lands leased by the Kansas Fish and Game Commission include 16,712 ac (6768.4 ha) of project lands situated primarily along the western side and northern end of Milford Lake. An additional 637 ac were surveyed during the spring of 1984 bringing the total area investigated at Milford Lake to 4815 ac (1925 ha) or 28.8 percent of the lands leased to the Kansas Fish and Game Commission (Figure 6).

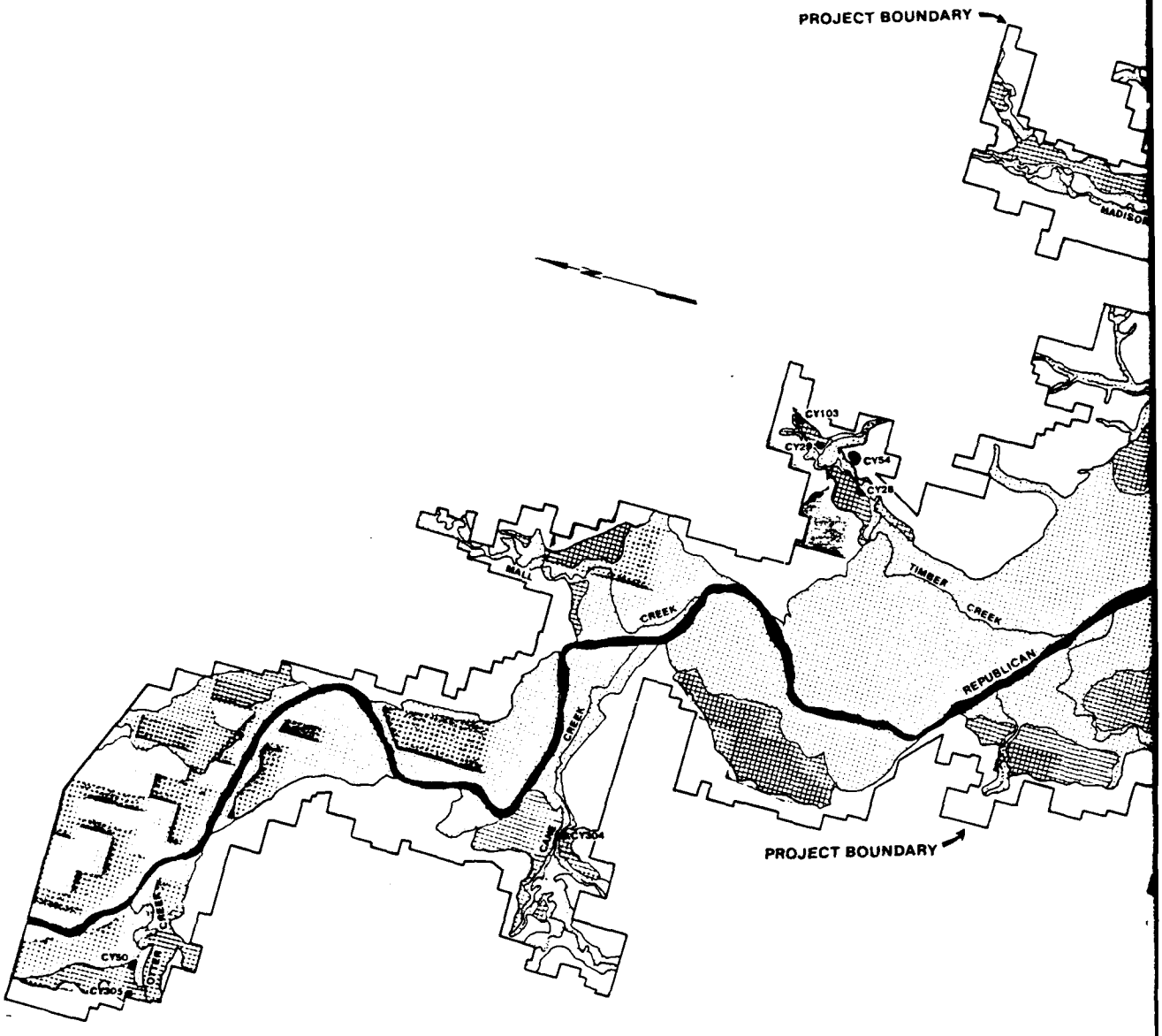
The original sampling design for the Milford survey was developed in the summer of 1981 and specified equal weighting of T-0, T-1 terrace and upland terrain. A reconnaissance of the Kansas Fish and Game Commission lands was conducted and fields within the various terrain types were selected for inventory. Unfortunately, the field work was delayed due to funding restrictions until late May of 1982. By this time large tracts of the previously selected survey units were covered with thick stands of wheat. The original sampling strategy was modified to include areas with adequate visibility and areas where the work would not interfere with agricultural production. Survey units were selected on the basis of ground cover and terrain type, while still attempting to provide adequate samples of the three terrain types. These modifications in the sampling design were approved by the U. S. Army Corps of Engineers prior to initiation of the field work. Most of the terrain investigated in 1984 consists of uplands located along the upper reaches of tributary streams. Valleys and terraces in these reaches are narrow and comprise minimal acreage. Also, at the time of the survey in the spring of 1984, large portions of the bottomlands were either inundated or consisted of wetlands precluding effective survey.

The 1982-1984 intensive survey of Milford Lake was conducted in accordance with the methods discussed in the research design (Section VI). Each survey tract was investigated by means of pedestrian transect sampling. Based on the analysis of site size at Milford Lake, a survey transect interval of 50 m was chosen. Transects were usually linear and oriented east to west or north to south depending upon the orientation of the survey tract. Survey transects which followed prominant natural features, such as stream banks, cutbanks, and terrace swales, were generally curvilinear. When a potential site was located, transects were reduced to either 5 or 10 m intervals, depending on the density of the cultural debris encountered. The site was then walked until its approximate boundaries were defined. The site was located on the appropriate USGS 7.5 minute topographic map and a field number was assigned. Kansas State Historical Society survey forms were then completed and official site numbers were later obtained. Due to the selection of survey tracts based on high visibility, subsurface survey sampling techniques were generally not required at Milford Lake. However, soil profile exposures, such as gullys and cutbanks, were inspected for indications of cultural remains. After completion of the survey, each of the located sites was tested to evaluate their eligibility for the National Register of Historic Places.

The areas surveyed at Milford Lake in 1982-1984 have been grouped into eight geographic areas. The eight survey areas defined at Milford Lake from north to south were designated as the Northern, Cane Creek, Mall Creek, Cocklebur Terrace, Timber Creek, Quimby Creek, East Quimby and Curtis Creek Areas. The distribution of the acreage by geomorphological terrain type of each tract surveyed within each area is presented in Table 11. A brief discussion of each survey unit and the results of the cultural resource inventory are presented below.

The Northern Survey Area is situated at the extreme northern end of Milford Lake and consists of nine survey tracts. The only significant tributary of the Republican River in the Northern Survey Area is Otter Creek. A total of 155 transects were required to survey the Northern Area. The Northern Area was the largest area surveyed at Milford Lake comprising a total of 1826 ac (739.5 ha). The Northern Area survey tract primarily consist of T-0 terrace and smaller areas of T-1 terrace located along Otter Creek and an intermittent stream on the eastern side of the survey unit (Figure 6). A total of 1450 ac of T-0 floodplain and 338 ac of T-1 terrace were inventoried. A small amount (38 ac) of uplands were also inventoried. Surface visibility varied from 50 to 100 percent with the majority of the survey tracts having 80 to 100 percent visibility. Fields were either freshly plowed or recently planted in corn, soybeans or milo.

The inventory of the Northern Survey Area resulted in the location of two sites, one of which (14CY50) was previously recorded. Both 14CY50 and the newly recorded site, 14CY305, are located on the T-1 terrace of Otter Creek. Sites were conspicuously absent on the floodplain of the Republican River probably due to their recent burial by floodplain deposits.


PROJECT BOUNDARY
CY103
CY29
CY54
CY28
MALL
CREEK
TIMBER
CREEK
REPUBLICAN
CREEK
CY104
PROJECT BOUNDARY
CY50
CY205

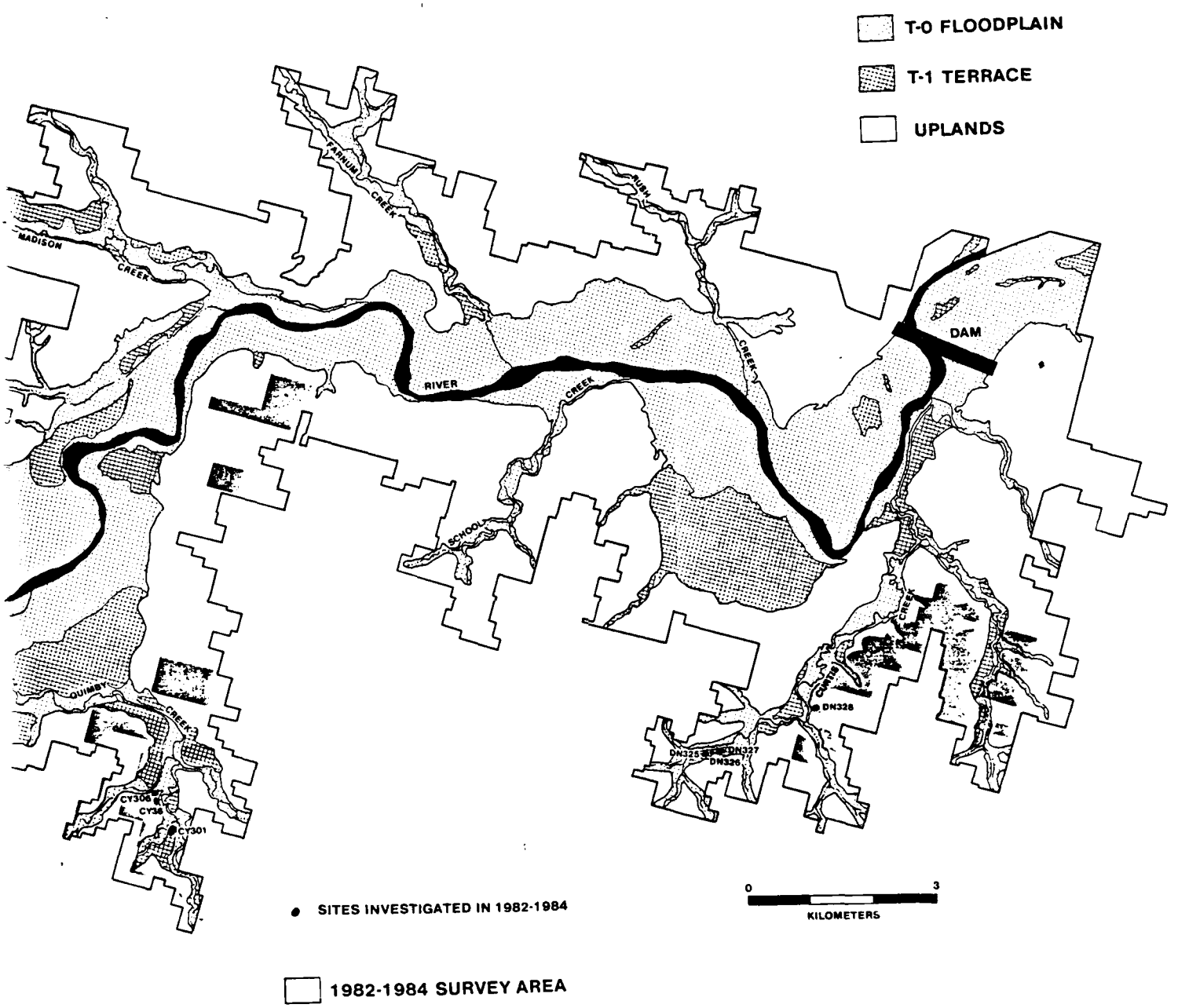



Figure 6. Location of area survey and sites investigated during the 1982-1984 survey at Milford Lake.



2

Table 11. Description and acreages of survey tracts at Milford Lake.

| AREA | Parcel | ACREAGE T-0 | T-1 | Uplands | TOTAL |
|---|---|---|---|---|---|
| Northern | 1 | 365 | 6 | | 371 |
| | 2 | 346 | 66 | 9 | 421 |
| | 3 | 17 | 141 | 14 | 172 |
| | 4 | 125 | 5 | 5 | 135 |
| | 5 | 32 | 79 | | 111 |
| | 6 | 272 | 2 | 10 | 284 |
| | 7 | 47 | 39 | | 86 |
| | 8 | 120 | | | 120 |
| | 9 | 126 | | | 126 |
| Total | | 1450 | 338 | 38 | 1826 |
| Cane Creek | 1 | 42 | 35 | 20 | 97 |
| Mall Creek | 1 | | 11 | 11 | 22 |
| | 2 | 4 | 25 | 17 | 46 |
| | 3 | 125 | 41 | 10 | 176 |
| Total | | 129 | 77 | 38 | 244 |
| Cocklebur Terrace | 1 | 3 | 109 | 6 | 118 |
| | 2 | | 146 | 10 | 156 |
| | 3 | | 97 | 6 | 103 |
| Total | | 3 | 352 | 22 | 377 |
| Timber Creek | 1 | | | 63 | 63 |
| | 2 | 3 | 23 | 96 | 122 |
| | 3 | 8 | | 51 | 59 |
| | 4 | 2 | 12 | 47 | 61 |
| | 5 | | | 31 | 31 |
| Total | | 13 | 35 | 288 | 336 |

continued

Table 11 continued. Description and acreages of survey tracts at Milford Lake.

| AREA | Parcel | ACREAGE T-0 | T-1 | Uplands | TOTAL |
|---|---|---|---|---|---|
| Quimby Creek | 1 | 13 | 66 | 4 | 83 |
| | 2 | | 68 | 7 | 75 |
| | 3 | 23 | 92 | 128 | 243 |
| | 4 | | | 100 | 100 |
| | 5 | | | 43 | 43 |
| | 6 | | 80 | 2 | 82 |
| | 7 | | | 35 | 35 |
| | 8 | 42 | 28 | 24 | 94 |
| | 9 | 37 | | 19 | 56 |
| | 10 | 9 | | 45 | 54 |
| Total | | 124 | 334 | 407 | 865 |
| East Quimby | 1 | | | 46 | 46 |
| | 2 | | | 42 | 42 |
| | 3 | 2 | | 121 | 123 |
| Total | | 2 | | 209 | 211 |
| Curtis Creek | 1 | 5 | 33 | 8 | 46 |
| | 2 | 3 | | 120 | 123 |
| | 3 | 5 | | 185 | 190 |
| | 4 | | | 42 | 42 |
| | 5 | 7 | 5 | 162 | 174 |
| | 6 | 7 | 5 | 18 | 30 |
| | 7 | | | 16 | 16 |
| | 8 | | | 48 | 48 |
| | 9 | | 6 | 184 | 190 |
| Total | | 27 | 49 | 783 | 859 |
| TOTAL | | 1790 | 1220 | 1805 | 4815 |

Only a small amount of the Cane Creek Area at Milford Lake was inventoried. The total of 97 ac inventoried consists of two survey tracts including 42 ac of T-0 floodplain, 35 ac of T-1 terrace and 20 acres of uplands. The fields in this unit had been plowed just prior to

the survey resulting in 99 to 100 percent surface visibility. The tracts surveyed in the Cane Creek Area required 14 survey transects. One site, designated as 14CY304, was located on the T-1 terrace of Cane Creek.

A total of 244 ac were surveyed in the Mall Creek Area. Terrain inventoried incliudes 129 ac of T-0 floodplain, 78 ac of T-1 terrace, and 38 ac of uplands. The fields in the Mall Creek Area had been either freshly planted or plowed prior to survey with surface visibility ranging from 60 to 100 percent. A total of 16 survey transects were required to survey this area. No sites were located in the Mall Creek unit, although two previously recorded sites, 14CY102 and 14CY41, were located just outside the unit's borders.

Three tracts were surveyed in the Cocklebur Terrace Area, which is located on the western side of Milford Lake. The tracts inventoried in this survey unit consist of 3 ac of T-0 floodplain terrain, 352 ac of T-1 terrace and 22 ac of uplands. Fields in this survey area were either in freshly planted milo and corn or were fallow and surface visibility ranged from 80 to 100 percent. A total of 24 transects were walked in this unit.

The Timber Creek Survey Area received only minimal coverage in 1982, when one tract consisting of 63 ac of uplands was inventoried. Consequently, this survey area was a major focus of the 1984 investigations when four survey tracts consisting of 273 ac (110 ha) were inventoried. Of the 336 total ac surveyed, upland terrain made up 288 ac of the area investigated with the remaining area including 13 ac of T-0 floodplain and 35 ac of T-1 terrace.

Surface conditions in upland pastures consisted of a thin cover of short grass with visibility ranging from 25 to 60 percent. Cultivated tracts on the floodplain, T-1 terrace and upland fields were in thin grass, short wheat, or corn stubble with surface visibility ranging from 50 to 100 percent. A total of 62 transects were required to survey the five tracts. Four sites were located in the Timber Creek Survey Area, including three previously unrecorded sites (14CY28, 14CY29, and 14CY54) and one previously unrecorded site (14CY103). All three sites are located on the T-1 terrace of Quimby Creek.

A total of 865 ac located in ten tracts were surveyed in the Quimby Creek Area. The eight tracts surveyed in 1982 include 78 ac of T-0 terrace, 334 ac of T-1 terrace and 343 ac of uplands. Two tracts investigated in 1984 consist of 64 ac of uplands and 46 ac of T-0 floodplain. The survey required a total of 128 transects. Most of the fields in this area were either freshly cultivated or had a stubble from the prior year's crop with surface visibility ranging from 80 to 100 percent. Fields in low wheat or thin grass accounted for four percent of the survey area and had a surface visibility of approximately 50 percent. A total of three sites were located including two previously recorded sites (14CY36 and 14CY301) and one new site (14CY306). 14CY36 and 14CY306 were located on upland terrain while 14CY301 was located on T-1 terrace.

The Curtis Creek area is the southernmost survey unit at Milford Lake. A total of 859 ac located in nine tracts was inventoried. Six tracts surveyed in 1982 account for 605 ac and three tracts investigated in 1984 covered 254 ac. A total of 783 ac of upland terrain was surveyed. The remainder of the terrain surveyed in this area consists of 49 ac of T-1 terrace and 27 ac of T-0 floodplain. A total of 122 transects were required to inventory the Curtis Creek tracts. Field conditions were similar to those in the other survey units with most of the fields having been either plowed or in stubble or freshly planted corn, beans, milo or wheat. Surface visibility ranged from 50 to 100 percent. A small portion (38 ac) of the survey area was in thick grass or wheat stubble and therefore requiring shovel testing. Four sites were located in the Curtis Creek Area, all previously unrecorded. Three sites, designated as 14DN325, 14DN326 and 14DN327, are all located closely together on the T-1 terrace. The fourth site, 14DN328, is situated on the uplands.

In summary, an intensive cultural resources inventory of 4815 ac of lands leased by the U. S. Army Corps of Engineers to the Kansas Fish and Game Commission was conducted during the spring and summer of 1982 and the spring of 1984. The area inventoried is located in eight survey areas and comprises 36 individual tracts within these areas. A total of 37.2 percent of the area sampled is classified T-0 floodplain terrain, 25.3 percent is T-1 terrace and 37.5 percent is upland terrain.

A total of 14 sites were located as a result of the inventory. Six sites (14CY28, 14CY29, 14CY36, 14CY50, 14CY54 and 14CY301) have been previously recorded. 14CY36 is situated on the T-0 floodplain. Sites 14CY28, 14CY29, 14CY50, 14CY103, 14CY301, 14CY304, 14CY305, 14DN325, 14DN326 and 14DN327, are situated on T-1 terraces. 14CY54 and 14DN328 are on the uplands. A discussion of the test excavations conducted at each site is presented on a site by site basis below.

## WEISIE SITE (14CY28)

This site was initially reported by Muller and Schock in 1964. They suggested that the site might be the Weisie site which had been reported and collected by Floyd Schultz. The cultural affiliation of the site is unknown. However, Muller and Schock suggested that the site may be related to the Woods site (14CY30), a Plains Village occupation located to the south of 14CY28. When relocated in 1984, the site consisted of a light lithic scatter located along a meander scar of the T-1 terrace of Timber Creek. The site was situated just east of a prominent bluff and is bounded on the north by a large borrow pit which may have destroyed part of the site (Figure 7). When surveyed, the site was in low wheat 15 to 20 cm high which had grown to 30-40 cm in height by the time the site was tested (Figure 8).

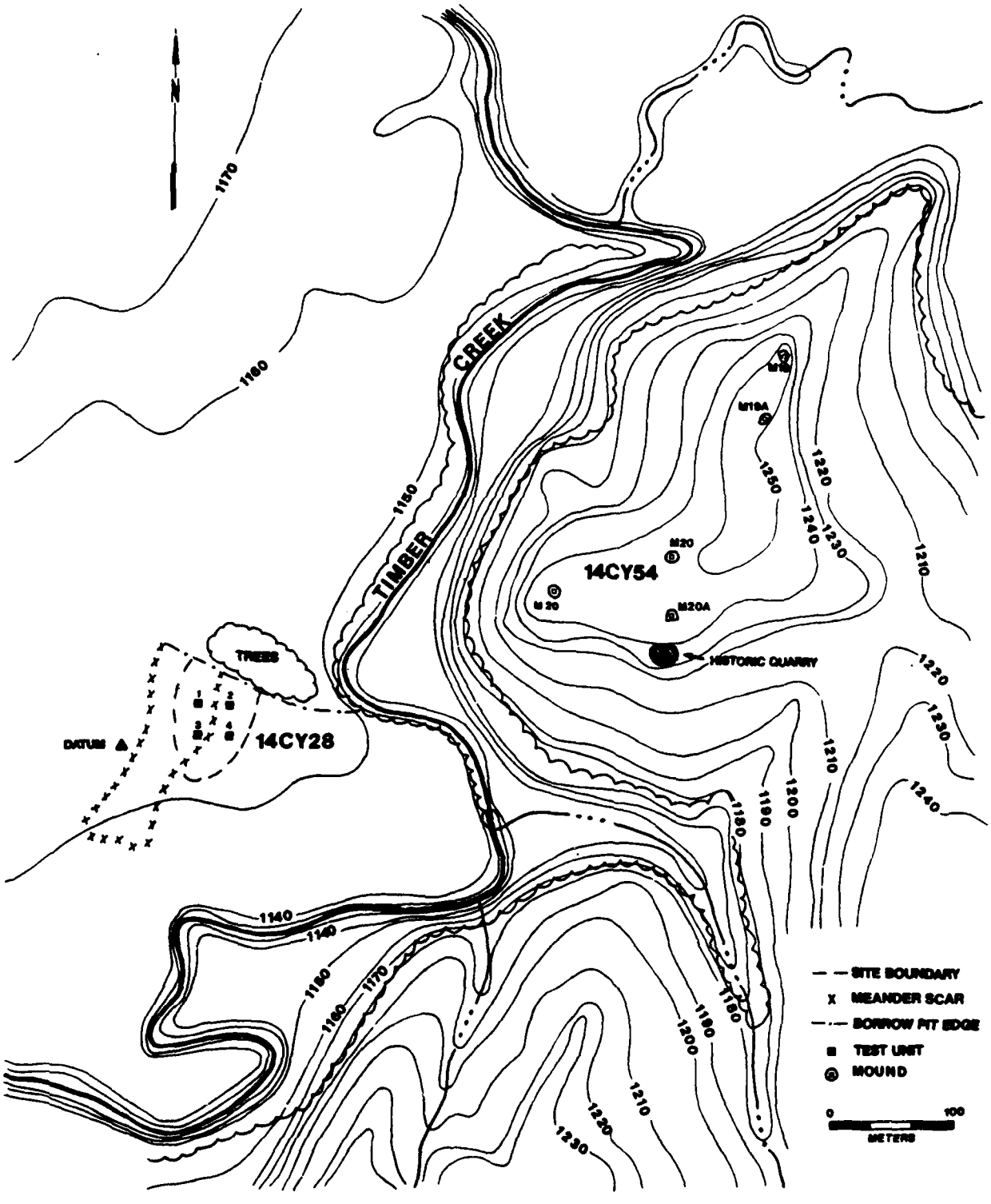



Figure 7. Location and plan view of the investigations at 14CY28 and 14CY54.

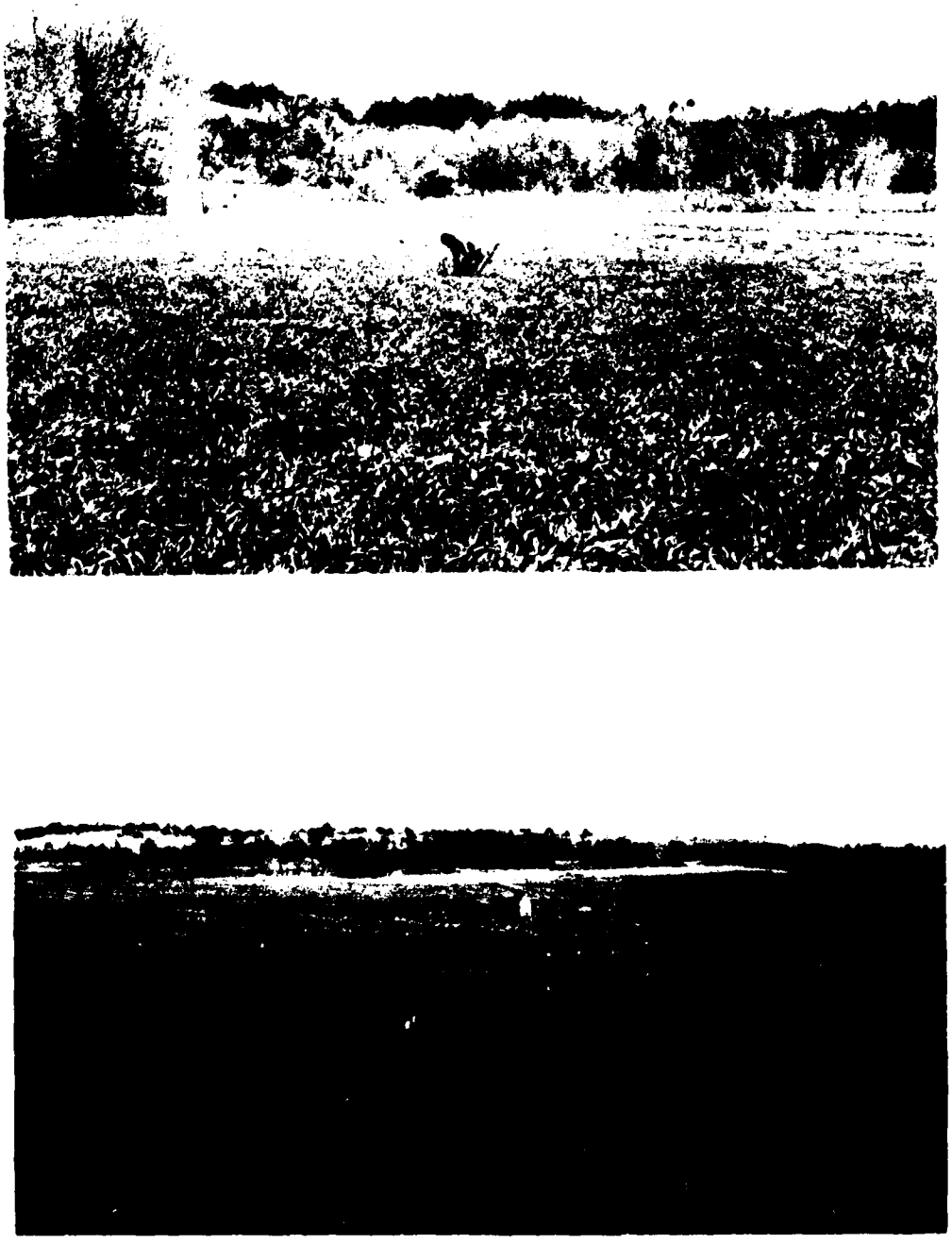


Figure 8. General views of 14CY28 and 14CY29. View to the southeast of testing at 14CY28 (upper) and general view to the east of 14CY29 (lower).

The 1984 test investigations included the establishment of a site datum, an intensive surface collection and the excavation of four test units. This work indicated that 14CY28 consists of a light lithic scatter extending over an area of 4300 sq m. Four test units were excavated at 25 m intervals and oriented in order to crosscut the T-1 terrace and the lower T-0 terrace near the center of the artifact scatter. The test excavations were sterile except for the recovery of one burnt rock and two pieces of unworked stone from the upper 20 cm of Test Unit 2.

## Soil Stratigraphy

14CY28 is located on soils mapped by the Clay County Soil Survey as Muir silt loam and Hobbs silt loam. The Muir silt loam is located on the higher T-1 terrace of the site where Test Units 1 and 3 were excavated. Hobbs silt loam is located on the lower T-0 floodplain portion of the site where Test Units 2 and 4 are located. Hobbs silt loam channeled is a frequently flooded creek bottom soil in narrow creek bottoms. Cultural materials were recovered from the surface of the Ap horizon on both soils. No subplowzone cultural materials were recovered. The profile of Test Unit 1, located on the Muir silt loam, and Test Unit 2, located on Hobbs silt loam, are presented below.

Test Unit 1:

| | | |
|---|---|---|
| Ap | 0-20 cm | Dark grayish brown (10YR4/2) silt loam; granular structure. |
| A | 20-50 cm | Dark grayish brown (10YR4/2) silt loam; granular structure to weak fine subangular blocky structure. |
| Bw1 | 50-70+cm | Very dark gray (10YR3/1) silty clay; strong fine subangular blocky structure. |

Test Unit 2:

| | | |
|---|---|---|
| Ap | 0-16 cm | Very dark grayish brown (10YR3/2) silty clay loam; granular structure. |
| C1 | 16-30 cm | Dark yellowish brown (10YR4/4) silty clay; granular weak fine subangular blocky structure. |
| C2 | 30-60+cm | Dark brown (10YR3/3) silt loam; granular to massive structure. |

## Artifact Assemblage

The artifact assemblage from 14CY28 consists of a small sample of chipped stone tools, lithic manufacturing debris, burnt rock and unworked stone. The two chipped stone tools include an unthinned bifacial blank manufactured from unheated local gray chert which appears to have fractured during reduction. The second tool consists of an edge-modified chunk which exhibits step fracture wear indicative of scraping use. The lithic manufacturing debris includes one core, seven chunks, four flakes, 12 chips and 13 pieces of shatter. The core is a piece of tabular gray chert from which five or six flakes have been removed. All but two pieces of debitage are local gray cherts. One piece of shatter is white quartzite and one flake is a light colored fossiliferous chert. Only one flake and two pieces of shatter appear to have been heat treated. The burnt rock consists of four small pieces of thermally oxidized pink limestone. The unworked stone consists of two small pieces of chert gravel.

## Discussion and Recommendations

14CY28 is a small light lithic scatter with a limited content. A previous survey at the site by the University of Kansas recovered only one flake. The 1984 investigations indicate that the site extends over 4300 sq m. Other than a biface blank and one edge-modified flake, no other chipped stone tools or temporally diagnostic artifacts were found, nor were any organics suitable for radiocarbon dating recovered from the excavations. Therefore, the cultural and temporal affiliations of this site cannot be determined. As noted above, Muller and Schock suggest a Plains Village period occupation based on its proximity to 14CY30 (the Woods site), which was identified as a Smoky Hill phase site by Witty (1963). Test excavations demonstrate that the cultural deposits at this site are restricted to the plowzone. Activities which may be inferred to have occurred at the site appear to be limited to chipped stone tool manufacture as indicated by the blank, core, chunks and flakes. 14CY28 appears to be a very limited-use site of unknown temporal affiliation. The site's limited content and lack of subsurface integrity severely limit its potential to address regional research questions. The site is not recommended to be eligible for the National Register.

## STREETER SITE (14CY29)

The Streeter site (14CY29) was first recorded and collected by Floyd Schultz of Clay Center, Kansas in the late 1920s. The Schultz collection was later donated to the University of Kansas. The site was tested in 1961 by the Kansas State Historical Society (Witty 1963). The 1961 investigations consisted of the excavation of twenty-six 60 by 60 cm test units and a trench 1.5 m deep crosscutting the terrace at the site, as well as an intensive surface collection. This work indicated that cultural materials were restricted to the plowzone and that very little material was present on the surface. No diagnostic artifacts and only one point fragment were recovered from the 1961 excavations. Based

on an examination of the Schultz collection from the site, which includes two decorated body sherds, Witty (1963) suggested that the site was related to the Middle Woodland Kansas City Hopewell complex.

The Schultz collection from the site discussed by Witty (1963) includes a sample of 30 points and seven sherds. The most numerous point type consists of expanding stemmed corner-notched forms somewhat similar to the Steuben type. The second largest group of points discussed by Witty consists of seven lanceolates with straight concave and convex bases. The remaining points in the Schultz collection consist of four triangular forms with straight bases and three contracting stemmed forms similar to Langtry or Gary types. Also illustrated by Witty are large bifaces which appear to be gouges and chisels. Expanding stemmed drills, end scrapers, a chert pendant and roulette decorated sherds are also present.

When relocated in 1984, the Streeter site was located in a field of low volunteer wheat and consisted of a large light lithic scatter located along the slopes and lower edge of a meander scar on the T-1 terrace of Timber Creek (Figure 9). The 1984 investigations included the establishment of a site datum, intensive surface collection and definition of the site limits. Subsurface investigations were not conducted due to the extensive test excavations conducted by Witty in 1961. A meander of Timber Creek is encroaching on the western side of the site and has exposed a steep profile of the terrace sediments approximately 3 to 4 m deep. This profile revealed no evidence of subsurface cultural deposits. The 1984 investigations recovered 198 artifacts and indicated that the Streeter site covered an area of 5960 sq m.

## Soil Stratigraphy

14CY29 is located on the T-1 terrace of Timber Creek. The channel of the creek has cut back into the T-1 deposit on the west side of the site, exposing approximately 5 m of terrace sediments in the stream bank. Timber Creek is bordered by a narrow T-0 floodplain on the west side of its channel.

The soils at 14CY29 are mapped as the Muir silt loam in the preliminary soil survey for Clay County. However, inspection of the stream bank on the western edge of the site revealed a soil profile that is not typical of the Muir series. This profile is described below.

| | | |
|---|---|---|
| Ap | 0-20 cm | Very dark grayish brown (10YR3/2) silt loam; moderate, fine, granular structure; common roots; gradual, smooth boundary. |
| A1 | 20-32 cm | Dark brown (10YR3/3) silt loam; moderate, fine, granular structure; common roots and pores; abrupt, smooth boundary. |
| B1 | 32-45 cm | Dark yellowish brown (10YR4/4) silty clay loam; moderate, very fine, subangular blocky structure; clear, smooth boundary. |

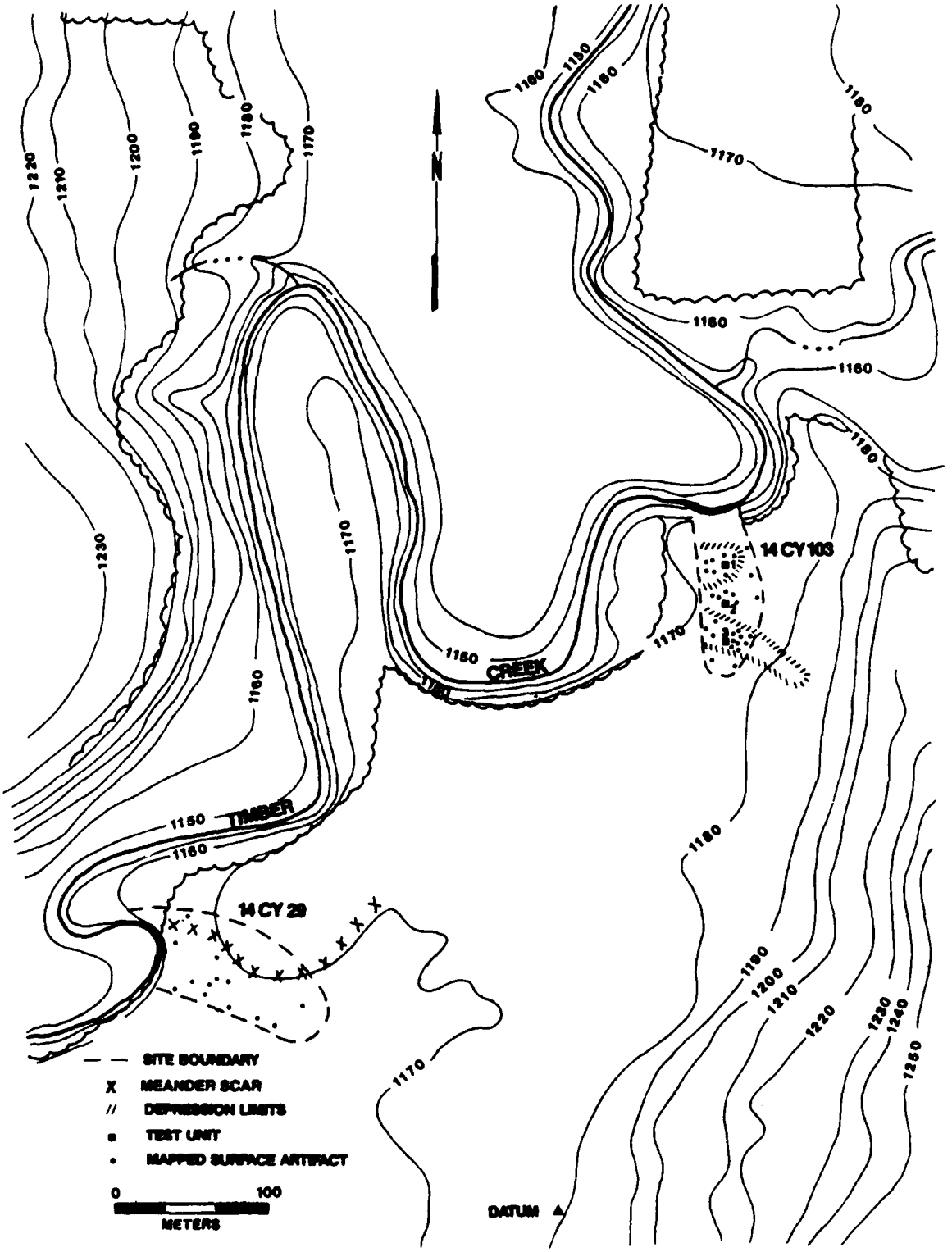



Figure 9. Location of sites 14CY29 and 14CY103.

| | | |
|---|---|---|
| B21t | 45-60 cm | Dark yellowish brown (10YR4/4) silty clay loam; moderate, very fine, subangular blocky structure; firm, gradual, smooth boundary. |
| B22t | 60-79 cm | Dark yellowish brown (10YR4/4) silty clay loam; moderate, fine, subangular blocky structure; firm; clear, smooth boundary. |
| C | 79-110 cm | Yellowish brown (10YR5/4) silty clay loam; weak, coarse, prismatic structure; hard when dry; few fine iron and manganese concretions. |

Unlike the Muir silt loam, the soil at 14CY29 has an argillic horizon. In addition, the soil exposed in the stream bank has distinct prismatic structure in the C horizon. The degree of soil development in the T-1 sediments at 14CY29 exceeds that of the Muir soil. Based on the soils evidence, it is likely that the T-1 surface at this site has been stable for at least two thousand years.

## Artifact Assemblage

A fairly substantial assemblage of cultural materials including 22 chipped stone tools, one ground stone mano, 152 pieces of lithic manufacturing debris and 20 pieces of burnt rock, unworked stone, animal bone and shell were recovered from the surface of 14CY29. Unfortunately, no ceramics or temporally diagnostic chipped stone tools were found. The chipped stone tools include two biface fragments, 17 edge-modified flakes and one edge-modified chunk. One biface fragment appears to be a midsection of a bifacial knife manufactured from local gray chert. The second specimen is a distal fragment of a point or drill also manufactured from local gray chert. Neither specimen appears to have been heated. All of the edge-modified debitage was manufactured from local gray chert. Five specimens appear to have been heat treated.

The mano is a fine grained brown quartzite cobble that has been ground to a smooth flat finish. The lithic manufacturing debris consists of two cores, six chunks, 75 flakes and 69 pieces of shatter. The lithic manufacturing debris is local gray chert, although one flake is a red quartzite. Twelve flakes have been heated.

Nine pieces of burnt limestone, seven pieces of unworked stone, two fragments of fresh water mussel shell and two pieces of unworked animal bone were also recovered during the investigations. Most of the burnt rock was recovered from south of the terrace scarp indicating that a hearth may have been plowed out in this area.

## Discussion and Recommendations

The Streeter site (14CY29) consists of a large light lithic scatter located on the T-1 terrace of Timber Creek. Extensive test excavations

conducted by the Kansas State Historical Society in 1961 indicated that no subplowzone cultural deposits were located at the site. This was confirmed by the absence of subsurface deposits in the cutbank on the western edge of the site in 1984. No diagnostic artifacts were recovered during the 1984 investigations and the earlier Kansas State Historical Society's work recovered only one point base.

Based on the presence of decorated ceramics in the Schultz collection, Witty (1963) suggested that 14CY29 dated to the Middle Woodland period. Since no diagnostic artifacts were recovered during the 1984 investigation, little additional data on the cultural affiliation of the site can be presented. The presence of ceramics in the Schultz collection clearly suggests the presence of a Plains Woodland component. The occurrence of a large number of expanding stemmed corner-notched forms, some of which are similar to the Steuben type, along with contracting stemmed forms similar to the Langtry type, also indicate that the primary occupation of 14CY29 occured during this period. The recovery of lanceolate points, however, may indicate that 14CY29 has multiple components. Lanceolate points are often associated with Archaic period occupations. The possible presence of an Archaic component at the Streeter site would indicate that the T-1 terrace surface here is quite old. Analysis of the 1984 collection of chipped stone tools would seem to indicate that 14CY29 is a small limited-use or special purpose camp. However, the substantial number of tools in the Schultz collection suggest that the site may be a residential camp. Activities which may be inferred to have taken place include hunting and butchering, hide preparation, perforating, plant food processing, woodworking and food preparation. As indicated by Witty's (1963) test excavations, any cultural features or in situ cultural deposits at the site have already been destroyed by recent agricultural practices.

In summary, 14CY29 consists of a large possibly multi-component site located on a prominent T-1 terrace of Timber Creek. The site appears to have Archaic and Plains Woodland components. The Plains Woodland occupation appears to be the most intensive occupation based on the ceramics and point styles in the Schultz collection. While the relationship of this site to Hopewell manifestations farther to the east and to nearby mound groups is significant, there appears to be little data left at the site. Based on the lack of stratigraphic integrity and content, 14CY29 is not recommended to be eligible for the National Register.

## 14CY36

14CY36 was first reported by Muller and Schock (1964). The site lies on the T-0 floodplain of Quimby Creek about 4.2 km southwest of the creek's confluence with the Republican River (Figure 10). The site is approximately 50 m east of 14CY306 and consists of a moderate lithic scatter which covers an area of approximately 9930 sq m.

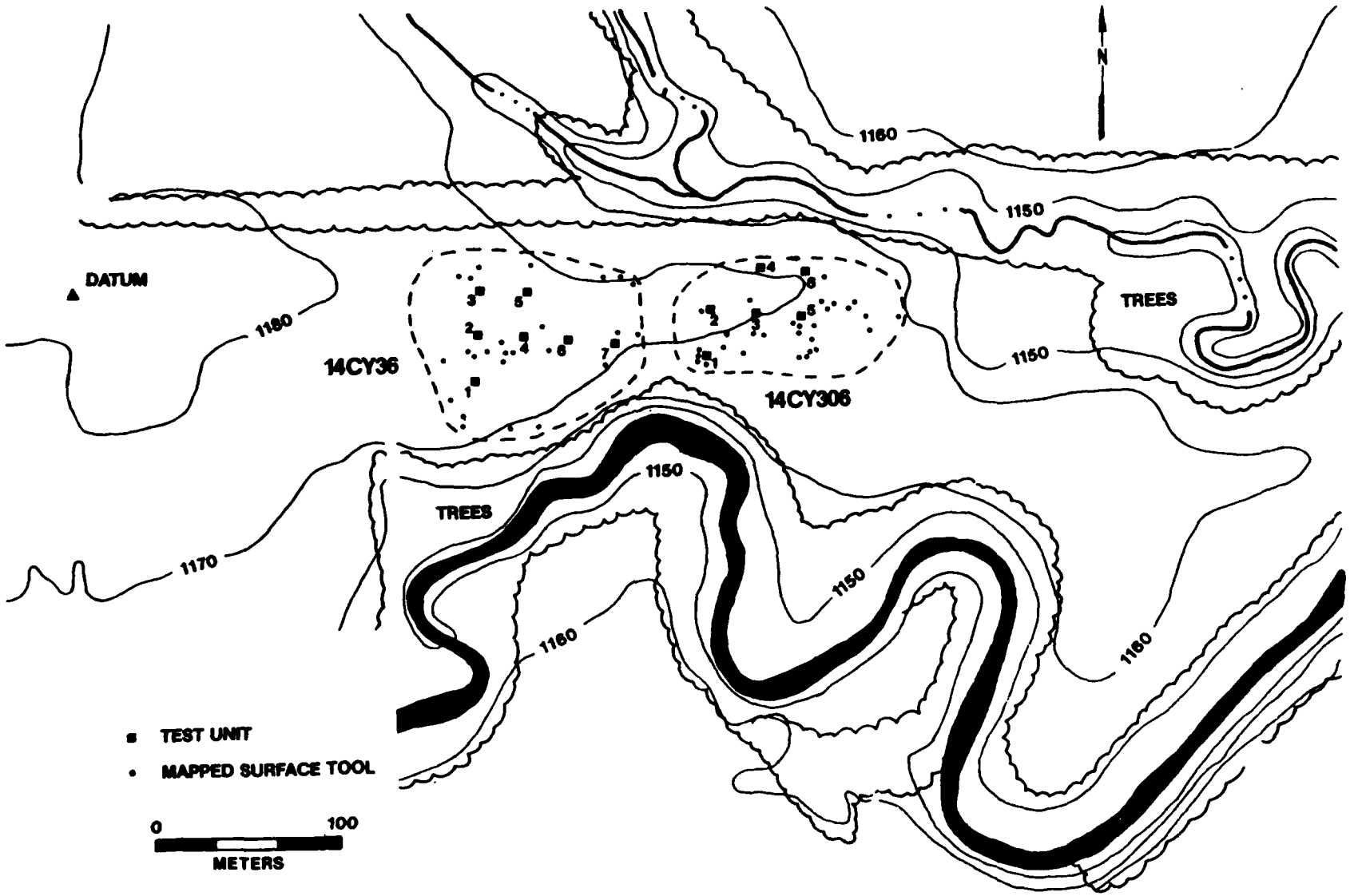



Figure 10. Location and plan view of test excavations at 14CY36 and 14CY306.

At the time of testing the site was in milo (Figure 11). Three test unit transects were laid out to sample the site. Seven one by one m test units were evenly spaced at 25 m intervals and were excavated to a depth of 80 cm. None of the test units revealed any cultural debris below the plowzone. All surface artifacts were mapped and collected.

## Artifact Assemblage

The artifact assemblage from 14CY36 consists of 33 chipped stone tools, 70 pieces of lithic manufacturing debris and 19 pieces of burnt rock, unworked stone and historic artifacts (Table 12). The majority of the tools are edge-modified flakes and scrapers, although three biface fragments were also covered. Two bifaces are distal sections of projectile points or bifacial knives (Figure 12a-b) while the third is a midsection of a biface. All three are made from mottled grayish brown chert and were recovered from the surface. None show any evidence of thermal alteration.

The six scrapers were recovered from the surface. Four are marginally retouched and two are unifacially worked end scrapers. One end scraper is made from dark blue chert. Heavy usage of this tool is evidenced by the pronounced step fracture wear on the distal and lateral edges. The other unifacial end scraper was manufactured from a mottled grayish white chert and exhibits much less wear. The remaining marginally retouched scrapers were made from flakes and chunks. One specimen, made from a marginally retouched flake, is pale blue in color. None of the scrapers were heated.

The edge-modified debitage includes 23 edge-modified flakes and one edge-modified chunk. One edge-modified flake was recovered from the 0-20 cm level of Test Unit 7 with the remainder recovered from the surface. These tools are made from light brown to gray to blue local cherts. Seven of the edge-modified tools have been thermally altered.

The 70 pieces of lithic manufacturing debris incluae one core, 15 chunks, 24 flakes and 30 pieces of shatter. The core was from the surface and is a bluish gray tabloid of local chert. Fourteen chunks were from the surface and one was recovered from the 0-20 cm level of Test Unit 1. All are unheated local blue or brown cherts. One flake was recovered from the 0-20 cm level in Test Unit 3 and a second from Test Unit 6. The remaining 22 were surface finds. The flakes include bifacial thinning flakes and secondary decortication flakes. Two pieces of shatter were recovered from the 0-20 cm level in Test Unit 1 and one piece each from the 0-20 cm level in Test Units 3 and 7. The remaining

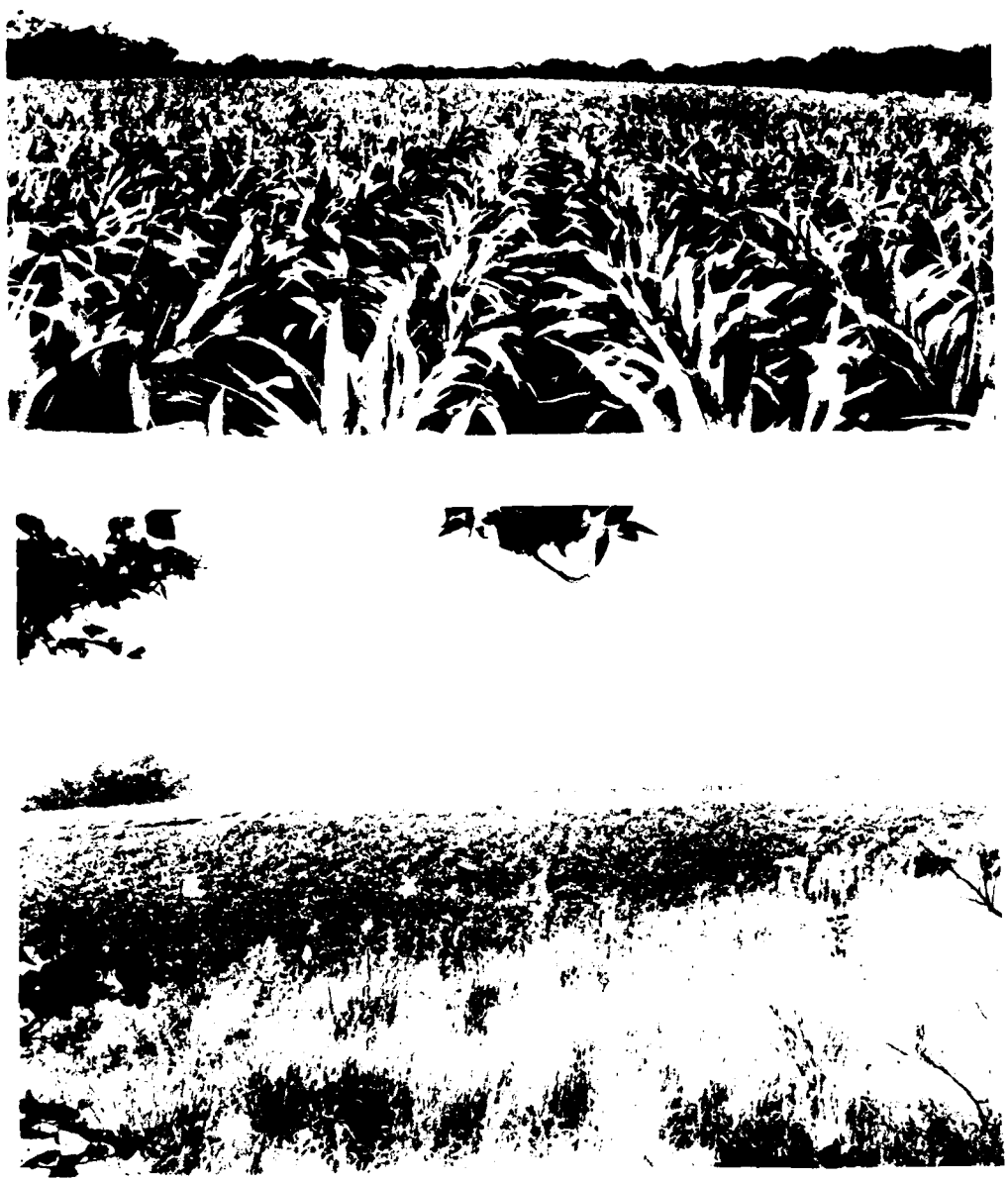


Figure 11. General views of 14CY36 and 14CY50. View to the west of 14CY36 (upper) and view to the west of 14CY50 (lower).

Table 12. Artifact assemblage from 14CY36.

| | Test Units | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|
| | 1 | 3 | 6 | 7 | | |
| CHIPPED STONE TOOLS | | | | | | |
| Biface Fragments | | | | | 3 | 3 |
| Scrapers | | | | | 6 | 6 |
| Edge-Modified Flakes | | | | 1 | 22 | 23 |
| Edge-Modified Chunk | | | | | 1 | 1 |
| Total | | | | 1 | 32 | 33 |
| LITHIC MANUFACTURING DEBRIS | | | | | | |
| Cores | | | | | 1 | 1 |
| Chunks | 1 | | | | 14 | 15 |
| Flakes | | 1 | 1 | | 22 | 24 |
| Shatter | 2 | 1 | 1 | | 26 | 30 |
| Total | 3 | 2 | 2 | | 63 | 70 |
| BURNT ROCK | | | | | 1 | 1 |
| UNWORKED STONE | | 5 | 1 | | 9 | 15 |
| HISTORIC ARTIFACTS | | | | | | |
| Metal | 1 | | 1 | | | 2 |
| Ceramic | | | | | 1 | 1 |
| Total | 1 | | 1 | | 1 | 3 |
| TOTAL | 4 | 7 | 4 | 1 | 106 | 122 |

26 pieces of shatter were from the surface. All of the manufacturing debris in locally available bluish gray to brown chert. Only six specimens were thermally altered.

Six pieces of unworked stone were recovered from the test units and nine pieces from the surface. This material is primarily small pieces of angular chert gravel. Three historic artifacts from 14CY36 include a




Figure 12. Artifacts from 14CY36, 14CY50 and 14CY306: a-b, bifacial knives from 14CY36; c, projectile point from 14CY50; d-e, bifacial blanks from 14CY306.

.22 caliber bullet recovered from Test Unit 6, a small metal ring from Test Unit 1 and a historic ceramic rim sherd from an ironstone vase.

### Discussion and Recommendations

14CY36 is a single component prehistoric site which is located on the floodplain of Quimby Creek just west of 14CY306. Intensive pedestrian survey indicated the presence of a moderate surface scatter. However, no debris was located below the plowzone in any of the seven test units and the site appears to have been disturbed by agricultural activity. The presence of the biface fragment and edge-modified flakes indicates that 14CY36 was an activity area focused on cutting and scraping tasks. Limited evidence of tool manufacture is present, consisting of the core and lithic manufacturing debris. Unfortunately, the cultural affiliation of the site cannot be determined due to the lack of diagnostic artifacts. The limited historic assemblage could be recovered from many agricultural fields, and is insufficient evidence to indicate the presence of a historic component. Based on the lack of intact subsurface deposits, 14CY36 is not considered eligible for the National Register.

## 14CY50

14CY50 was located by Muller and Schock during their 1964 survey (Muller and Schock 1964). The site lies on a prominent T-1 terrace near a bend in Otter Creek, just upstream from its confluence with the Republican River. During the 1982 survey, visibility at the site was 100 percent and the site was found to be a light lithic scatter extending over an area of 14990 sq m. When testing was initiated, the field was in waist high soybeans. Flagging of surface cultural debris was carried out by walking between the rows of beans. All located artifacts were mapped and collected. Two transects of one by one m test units were laid out to crosscut the site limits (Figure 13). The six test units were excavated to a depth of 80 cm. No cultural debris was located below the plowzone.

### Soil Stratigraphy

14CY50 is located on soils mapped by the Clay County Soil Survey as the Muir silt loam. Muir soils are terrace soils which form on noncalcerous silty alluvium. All of the cultural materials recovered from 14CY50 are located on the Ap horizon. The profile of Test Unit 4 is presented below.

| | | |
|---|---|---|
| Ap | 0-20 cm | Dark grayish brown (10YR4/2) silt loam; fine granular structure. |

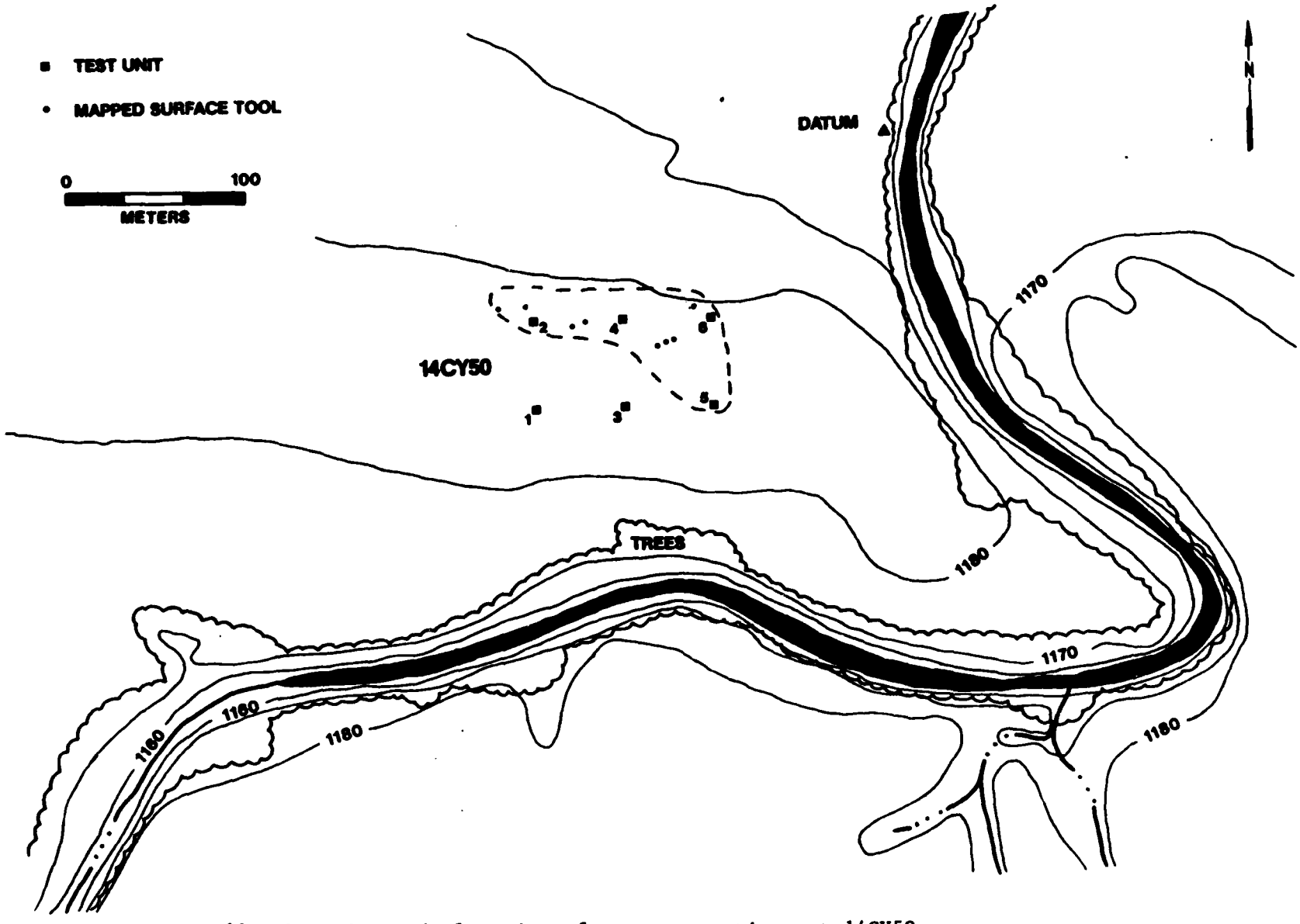



Figure 13. Location and plan view of test excavations at 14CY50.

| | | |
|---|---|---|
| A | 20-50 cm | Very dark grayish brown (10YR3/2) silt loam; granular to very fine subangular blocky structure. |
| Bw1 | 50-80+cm | Very dark grayish brown (10YR4/2) silty clay; moderate subangular blocky structure. |

## Artifact Assemblage

The artifact assemblage from 14CY50 includes 20 chipped stone tools, 73 pieces of lithic manufacturing debris, one ground stone tool, two minerals, one burnt rock and two pieces of glass (Table 13). The chipped stone tools include one projectile point, three biface fragments, 15 edge-modified flakes and one edge-modified chunk. With the exception of the point, all of these tools were recovered from the surface. The point was recovered from the 0 to 20 cm level of Test Unit 4. It is a fragment of a small triangular arrow point made from unheated local gray chert (Figure 12c). The point exhibits a transverse break at the distal end of the fragment and a diagonal break at the proximal end. The presence of the point suggests a Plains Woodland or Plains Village cultural affiliation for the site.

The three small biface fragments are made from local gray chert and include one thermally altered fragment with an impact fracture. The 15 edge-modified flakes predominately have step fracture wear indicating light-duty scraping tasks. All of the edge-modified flakes were derived from unheated locally available gray to brown chert. One heated edge-modified chunk with a concave working edge was also recovered.

The ground stone tool is a hammerstone made from a stream-worn, fine grained brown quartzite cobble. Battering is present on three edges of the cobble. The lithic manufacturing debris includes 41 flakes, four chunks and 28 pieces of shatter. Bifacial thinning flakes are present as are secondary decortication flakes. Twelve of the 41 flakes have been thermally altered. The manufacturing debris was principally recovered from the surface, although a small percentage was recovered from the plowzone in the test units.

Except for five pieces of white fossiliferous chert, all the manufacturing debris was derived from local gray or brown cherts. Other miscellaneous debris from the site includes two pieces of hematite, one burnt rock and two pieces of glass. One piece of glass is a weathered bottle fragment and the other is a piece of white milk-glass jar lid.

## Discussion and Recommendations

14CY50 is a light lithic scatter located on a prominent T-1 terrace of Otter Creek. The excavation of six test units to a depth of 80 cm failed to locate any cultural deposits below the plowzone. Based on the presence of a triangular arrow point, the site appears to be a Plains

Table 13. Artifact assemblage from 14CY50.

| | Test Units | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 4 | 5 | 6 | Surface | TOTAL |
| CHIPPED STONE TOOLS | | | | | | | |
| Projectile Point | | | 1 | | | | 1 |
| Biface Fragments | | | | | | 3 | 3 |
| Edge-Modified Flakes | | | | | | 15 | 15 |
| Edge-Modified Chunk | | | | | | 1 | 1 |
| Total | | | 1 | | | 19 | 20 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | |
| Chunks | | | | | | 4 | 4 |
| Flakes | 1 | 1 | | 2 | | 37 | 41 |
| Shatter | | 2 | 1 | | 1 | 24 | 28 |
| Total | 1 | 3 | 1 | 2 | 1 | 65 | 73 |
| GROUND STONE TOOL | | | | | | 1 | 1 |
| MINERALS | | | | | | 2 | 2 |
| BURNT ROCK | | | | | | 1 | 1 |
| HISTORIC ARTIFACTS | | | | | | 2 | 2 |
| TOTAL | 1 | 3 | 2 | 2 | 1 | 90 | 99 |

Village occupation although the evidence for this interpretation is small. The limited content of the site and the lack of undisturbed cultural deposits indicates that 14CY50 was a temporarily occupied campsite. The presence of a fragmentary arrow point indicates that hunting may have occurred. Light-duty scraping tasks also took place, as did the manufacture of chipped stone tools. Based on the limited content of the site and the lack of undisturbed cultural deposits, 14CY50 is not considered eligible for the National Register.

## 14CY54

14CY54 is one of the many mortuary sites in the Milford area first investigated by Floyd Schultz. Muller and Schock (1964) found a reference in Schultz's notes on the Weisie site (14CY28) to the presence of two mounds on the Weisie Farm. While Muller and Schock did not actually relocate the site during their survey, they did correctly indicate the site's probable location and recommended that the site be reinvestigated. O'Brien (1976) relocated and recorded the site in 1976. On the site survey form, she notes that the north mound is designated as Mound 19 and the west mound is designated Mound 20 on Schultz's mound list. It is not known whether Schultz excavated either or both of these mounds.

Upon relocation during the 1984 survey of the Timber Creek Area, 14CY54 was found to consist of two mound groups comprising four mounds, a possible fifth mound and a historic quarry (Figure 14). Following Schultz's original designations, the northern mound group has been designated Mound Group 19 and the western mound group as Mound Group 20. Since the mound groups are distributed widely over the bluff crest (Figure 14), the entire blufftop is interpreted as being a ritual-mortuary site covering an area of approximately 25,670 sq m.

The only portable artifacts recovered from the 1984 investigations at the site consist of one edge-modified flake and five pieces of shatter which were widely scattered over the bluff. Evaluative investigations consisted of the establishment of a site datum from which the mortuary features were mapped, along with description and photo documentation of the various features. Subsurface investigations were not warranted to determine the site's eligibility for the National Register.

### Mound Group 19

Mound Group 19 is located at the northern end of the bluff and consists of two distinct forms of tumuli (Figure 7). The northernmost mound, probably designated by Schultz as Mound 19, can be more accurately termed a cairn, as it is composed almost entirely of stone. Mound 19 is located near the edge of the northern bluff crest and overlooks site 14CY29. The mound or cairn is situated along the highest portion of the bluff at the 1250 ft contour and consists of a roughly circular concentration of various sized limestone rocks 8 m in diameter with a maximum height of 40 cm (Figure 14). A roughly rectangular depression approximately 1.5 m long by 1 m wide and 20 to 30 cm deep is located near the center of the cairn. This depression appears to represent a previous excavation.

The second mound was identified in 1984 and designated as Mound 19A. It is situated 50 m south of Mound 19 along the 1250 ft contour and consists of a low indistinct and dome-shaped configuration of soil and smaller limestone rocks. This mound is approximately 6 m in diameter and is 15 to 20 cm high at the highest point. Mound 19A also contains a

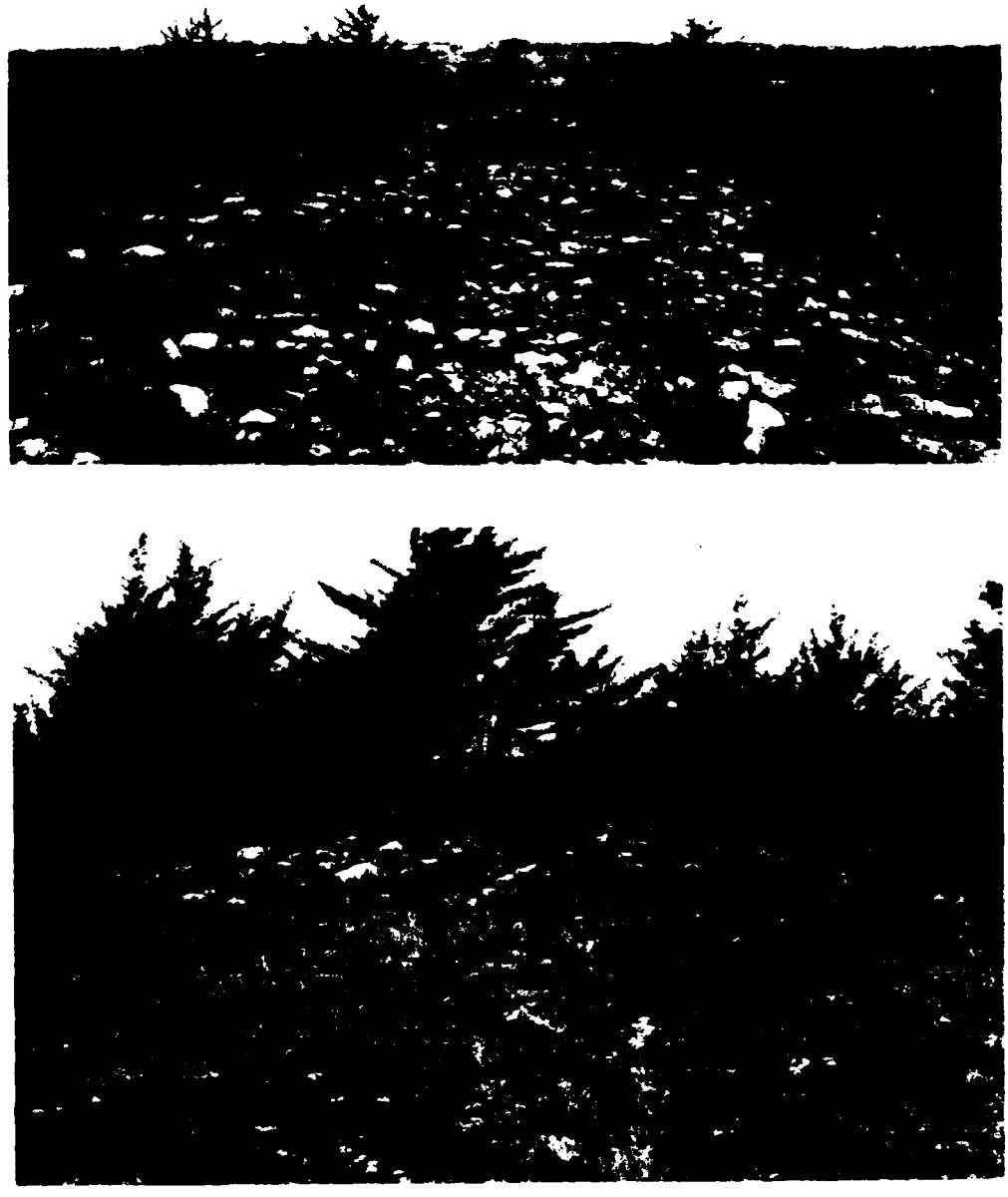


Figure 14. General view of site 14CY54. View to the south of Mound 19 (upper) and view to the west of Mound 20 (lower).

sub-rectangular depression approximately 2 m by 1.5 m in size, presumably from a previous excavation.

## Mound Group 20

Mound Group 20 is located on the south central and southwestern side of the blufftop (Figure 7). This mound group is similar to the Mound 19 group in form and layout, consisting of a cairn and a less distinct earthen mound. The cairn (Schultz's Mound 20) is located near the 1240 ft contour on the bluff crest edge overlooking 14CY28 (Figure 14). Mound 20 is 8 m in diameter and rises 35 cm above the ground at its highest point. The mound is composed of various sized limestone rocks. The mound has a centrally located rectangular hole 2 m long by 1 m wide and 25 cm deep which appears to be a previous excavation.

The associated low and indistinct earth and rock fill mound, designated as Mound 20A, is located 95 m east of Mound 20. Mound 20A is roughly circular in shape with a diameter of 10 m. The mound is 15 to 20 cm high at its highest point above the bluff surface. This mound appears to have been trenched during a previous excavation. A rectangular depression 4 m long by 2 m wide crosscuts the mound from southwest to northeast. Mound 20A is similar to, though somewhat larger than, Mound 19A.

A third possible low earthen mound was located 45 m north of Mound 20A. This probable mound is highly disturbed by burrowing rodents. No artifacts were found in the burrow fill and this feature could be an old rodent burrow such as a prairie dog village. The general form, however, is similar to the earthen mounds 19A and 20A. Since this feature may represent a disturbed earth tumuli, the area was designated as Mound 20B. Mound 20B is roughly 7 m in diameter and 15 to 20 cm in maximum height.

## Quarry

A large depression 12 m in length, 7 m in width and 1 m in depth was located along a limestone outcrop on the southern edge of the bluff top at 14CY54 (Figure 7). This ovoid depression is situated 35 m south of Mound 20A and contains numerous tabular limestone blocks. No artifacts were located in the vicinity of the depression. The limestone outcrop in this quarry has natural fracture planes forming rough rectangular blocks of varying size. The excavation appears to be a Historic period limestone quarry rather than a quarry associated with the construction of the prehistoric mounds. The quarry is located over 100 m east of Mound 20 and over 250 m south of Mound 19. The volume of rock removed would appear to be greater than the entire volume of rock utilized in constructing Mounds 19 and 20. The cairns are also constructed largely of smaller limestone slabs which are readily available in the vicinity of the mounds. The thick rectangular blocks observed in the bottom of the quarry would have required excavation and prying out. Limestone blocks are one of the most common Historic period building materials used in this part of Kansas and the quarry's location would have allowed

convenient access. Based on these considerations, this feature does not appear to be associated with the prehistoric mortuary complex at the site.

## Discussion and Recommendations

14CY54 is a multicomponent special-use site situated on the summit of a bluff east of Timber Creek. The prehistoric component consists of a mortuary complex composed of two mound groups including four and possibly five mounds. Two types of tumuli are present. The first consists of limestone cairns situated on the most prominent points of the bluff overlooking the valley of Timber Creek. These cairns are approximately 8 m in diameter and 30 to 40 cm in height. The second consists of low indistinct earth and rock fill mounds 6 to 9 m in diameter and 15 to 20 cm in height. These mounds are situated in less prominent positions on the bluff and appear to be arranged south and east of the cairns.

It cannot be determined from the presently available data if the two styles of mortuary structures are components of the same mortuary complex, or if they represent the work of two distinct cultural complexes. The apparent co-occurrence of cairns and earthen mounds may indicate that the two mound styles are part of the same ritual complex, although this cannot be demonstrated. The temporal position of the mounds is also unknown. Few mounds or cairns have been excavated and reported from this area of Kansas. The James Younkin Mound was excavated by Schultz in 1931 (Schultz and Spaulding 1948). The description of this mound indicates that was considerably larger than those at 14CY54. Schultz and Spaulding interpret the rich grave furnishings recovered from the mound as indicating affiliation with the Middle Woodland Kansas City Hopewell complex. They also indicate that artifacts from the mound appear to be related to the preceeding Late Archaic period and that they also have some traits more common to later Plains Village periods. Based on the analysis of Schultz's collections and the testing of the Dan Younkin Mounds (14GE2), Eyman (1966) defined a Middle Woodland Schultz focus mortuary complex for the Milford area. Given the occurrence of Middle Woodland Hopewellian traits in many of the Schultz Mounds and the nearby location of a Plains Woodland period site with Hopewellian characteristics (14CY29), the mound groups at 14CY54 are likely affiliated with the Plains Woodland Schultz phase.

Mound construction is generally considered to be one of the major traits of the Woodland period. The association of cairns and other mound tumuli with the Woodland period is evidence that 14CY54 dates to this period. This inference is, however, not conclusive due to the increasing incidences of mounds and cairns associated with the Archaic period (Kleppinger and Henning 1976; Wood 1961; Reynolds 1977). After conducting an extensive investigation of mound and cairn tumuli sites in southwestern Missouri, Wood (1961) concluded that although the specific mode of burial within cairns and mounds may vary through time, the technique of using cairns and mounds as cemeteries commenced in the Archaic and lasted to the Protohistoric or Historic periods. Reynolds

(1977) considers the Range and Matter Mounds (14ML307) in north central Kansas to date to the Late Archaic period.

In summary, 14CY54 is a mortuary complex consisting of two cairns and two or three smaller earthen and rock mounds. All of the mounds appear to have been disturbed to varying degrees by previous excavations. However, the mounds likely retain structural and/or artifactual content as indicated by the recovery of numerous artifacts from excavated mounds exhibiting similar disturbances (Schultz and Spaulding 1948; Wood 1961, 1967; and Reynolds 1977). The mound complexes are likely associated with the Plains Woodland Schultz phase, although the possibility of an earlier Archaic period affiliation or later Plains Village affiliation cannot be precluded based on the data at hand. As a component of a poorly understood mortuary complex, 14CY54 has the potential to add significant data on the prehistory of northeastern Kansas. 14CY54 is recommended to be eligible for the National Register. The site does not appear to be in any danger of negative impact from the current land-use (grazing) and all of the disturbance observed at the site appears to be quite old. Therefore, no mitigative actions are recommended for 14CY54.

## 14CY103

This previously unrecorded site consists of a light lithic scatter situated on an undulating terrace south of a meander of Timber Creek (Figure 9). The site was located approximately 450 m northeast of 14CY29 and was in a field of milo stubble with a surface visibility of 80 percent when initially located (Figure 15). Evaluative investigations at the site included the establishment of a permanent datum, the intensive collection of surface artifacts and the excavation of three one by one m test units at 25 m intervals. The investigations indicated that the site covered an area 90 m north to south by 40 m east to west. The transect of test units was located near the center of the site and placed so as to crosscut the low ridge and swales on the terrace surface and the dense artifact scatter defined at the site. The site covers an area of 2980 sq m. A meander of Timber Creek is encroaching on the northern edge of the site. Debitage was found in the upper 30 cm of this cut.

The test excavations encountered a paleosol at 25 cm below the surface in Test Unit 1. This test unit was located in a swale on the terrace surface just south of the encroaching meander of Timber Creek. The paleosol contained burnt clay, charcoal, unworked animal bone and burnt rock. Test Unit 2, situated on a low rise south of Test Unit 1, encountered no evidence of the paleosol nor were any cultural materials found in this unit. Test Unit 3, situated in low depression south of Test Unit 2 encountered Feature 1, a small burnt concentration of burnt rock, 20 cm below the surface. The paleosol was not encountered in this test unit and the cultural material did not extend below a depth of 30 cm.

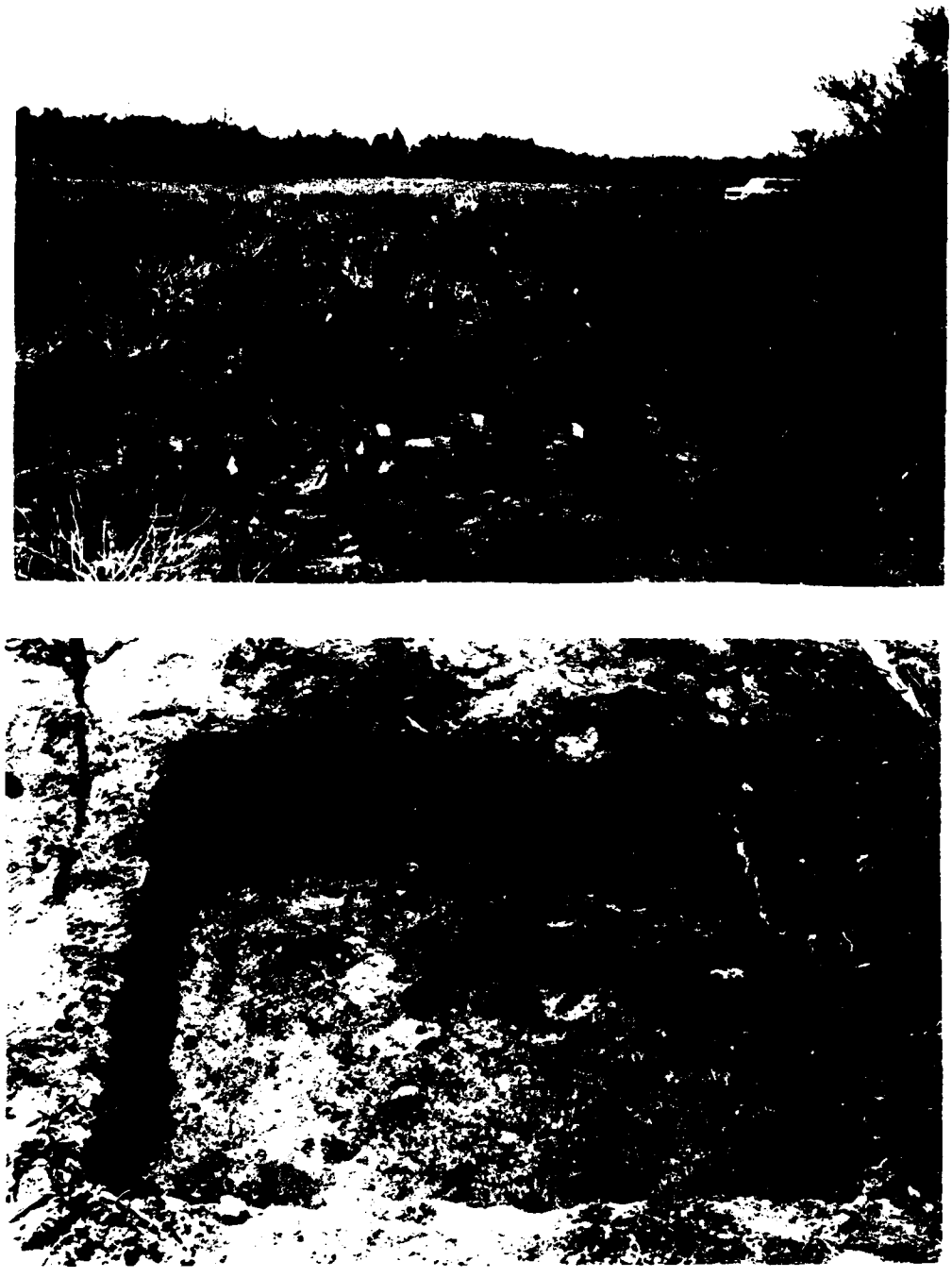


Figure 15. General view of the excavations at 14CY103. General view of the excavations in progress (upper) and Feature 1 (lower).

## Soil Stratigraphy

Site 14CY103 is located on the T-1 terrace of Timber Creek. The site is bordered on the north and west by the creek. The stream has cut back into the T-1 deposit on the northern fringe of the site, creating a steep cutbank. There is a very narrow T-0 floodplain on the north side of the creek.

The soils at 14CY103 are mapped as Geary silt loam in the preliminary soil survey for Clay County. The Geary series consists of deep, well-drained soils formed in loess. However, the sediments exposed in the cut-bank along the northern edge of the site are clearly alluvial in origin. Alluvial soils formed on terraces of Timber Creek are classified as Muir silt loam. A description of the soil profile exposed in the cut-bank is given below.

| | | |
|---|---|---|
| Ap | 0-18 cm | Very dark gray (10YR3/1) silt loam; moderate, fine granular structure; common fine roots; abrupts, smooth boundary. |
| A1 | 18-45 cm | Black (10YR2/1) silt loam; moderate, fine, granular structure; clear smooth boundary. |
| B1 | 45-68 cm | Very dark grayish brown (10YR3/2) silty clay loam; moderate, fine, subangular blocky structure; gradual smooth boundary. |
| B21t | 68-120 cm | Dark yellowish brown (10YR4/4) heavy silty clay loam with very dark grayish brown (10YR3/2) mottles; moderate, fine, subangular blocky structure; gradual, smooth boundary. |
| B22t | 120-170 cm | Brown (10YR4/3) heavy silty clay loam; weak, medium, blocky structure; thin, discontinuous clay skins on ped surfaces; firm. |

The soil at 14CY103 does not fit the description of the Muir silt loam. The profile in the cutbank is characterized by a thick argillic horizon with soil colors ranging from dark yellowish brown to brown. In contrast, the Muir series lacks an argillic horizon, and its B horizon is generally dark grayish brown in color. The soil at 14CY103 probably belongs to the Reading series. This series is mapped on stream terraces throughout Riley and Geary counties. The Reading soil is characterized by a heavy silty clay loam B2t horizon that ranges from dark yellowish brown to brown in color. The presence of an argillic horizon indicates that this soil has formed on a surface that has been stable for at least several thousand years.

Based on field observations, sites 14CY103 and 14CY29 are on the same T-1 surface of Timber Creek. Furthermore, the soils at both sites probably belong to the Reading series instead of the Muir or Geary series.

## Cultural Feature

Feature 1, encountered in Test Unit 3 at the base of the plowzone, consisted of a small cluster of burnt rock surrounded by a light charcoal stain with occasional burnt clay flecks. The feature was located between 17 and 25 cm below surface. A total of 13 small pieces of limestone 5 to 8 cm in diameter and fired to a dull red color were recovered from the feature. No chipped stone tools or debitage were associated. The feature is interpreted to be a slightly deflated hearth.

## Artifact Assemblage

A limited artifact assemblage was recovered from 14CY103. The sample includes edge-modified debitage, lithic manufacturing debris, an unidentified baked clay object, unworked bone, burnt rock and unworked stone. The distribution of this material is presented in Table 14.

The chipped stone tools include one edge-modified chunk and four edge-modified flakes. All are made from unheated local gray cherts and were recovered from the surface. Lithic manufacturing debris consisted of seven chunks, 19 flakes and nine pieces of shatter. All of these artifacts are made of locally available gray chert. All of the flakes are small secondary or bifacial thinning flakes. Only one piece of shatter appears to have been heated. Except for two chunks recovered from the plowzone of Test Unit 3, all of the lithic manufacturing debris was recovered from the surface. The baked clay object was recovered from the base of the plowzone in Test Unit 1. It is a small smoothed or molded clay cylinder which tapers at one end. The piece lacks temper, but has been fired. The shape suggests that it may be a lug support for a large ceramic vessel. Other cultural debris recovered from the site includes one animal bone fragment, 25 burnt rocks mainly from Feature 1, and 26 pieces of unworked stone.

## Discussion and Recommendations

14CY103 is a small light lithic scatter distributed over an undulating T-1 terrace surface. The test excavations located a buried soil containing cultural debris in a swale just south of the encroaching stream meander of Timber Creek. The remains of a hearth with a light charcoal scatter was also recovered from a test unit in a second swale to the south.

The very limited artifact assemblage indicates that 14CY103 represents a small briefly occupied residential camp. No temporally diagnostic artifacts were recovered. However, the fired clay object would suggest

that this site is a ceramic occupation. The investigations indicate that at least the portions of this site located in the two swales contain intact subsurface deposits with organic preservation. The preservation of organics indicates that 14CY103 has potential to add significant data regarding the subsistence patterns of prehistoric groups exploiting the tributaries of the Republican drainage. Based on this consideration, 14CY103 is recommended to be eligible for the National Register. The site is being negatively impacted by natural creek bank erosion and by plowing. It is recommended that 14CY103 be taken out of agricultural production. It is further recommended that the cutbank of Timber Creek near the site be monitored to determine if significant data is being destroyed.

Table 14. Artifact assemblage from 14CY103.

| | Test Units | | | Surface | TOTAL |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | | |
| CHIPPED STONE TOOLS | | | | | |
| Edge-Modified Chunk | | | | 1 | 1 |
| Edge-Modified Flakes | | | | 4 | 4 |
| Total | | | | 5 | 5 |
| LITHIC MANUFACTURING DEBRIS | | | | | |
| Chunks | | | 2 | 5 | 7 |
| Flakes | | | | 19 | 19 |
| Shatter | | | | 9 | 9 |
| Total | | | 2 | 33 | 35 |
| UNWORKED BONE | 1 | | | | 1 |
| BAKED CLAY OBJECT | 1 | | | | 1 |
| BURNT ROCK | | | 24 | 1 | 25 |
| UNWORKED STONE | 17 | 1 | 8 | | 26 |
| TOTAL | 19 | 1 | 34 | 39 | 93 |

## AVERY SITE (14CY301)

The Avery site (14CY301) is located on a narrow branch of Quimby Creek about 5.6 km southwest of the stream's confluence with the Republican River (Figure 16). The site was located by Fred Oswald and reported to the Kansas State Historical Society (Witty 1963). Investigations were conducted at this site by the society in 1961 and consisted of the excavation of 38 five by five ft test units. Although the deepest excavation went to a depth of 2.25 m, the average depth of the excavations was between 1 and 1.2 m. Witty (1963) reported that 14CY301 was a stratified multicomponent occupation with two cultural zones referred to as Zones A and B. Zone A extends from the surface to a depth of 76 cm. Diagnostic artifacts recovered from this zone included large stemmed and corner-notched points, a variety of bifaces including chipped stone celts and hoes and grit tempered, cordmarked pottery. Nine features from Zone A consisted of burnt rock clusters with associated charcoal, burnt earth and bone. Witty suggested that the location of these features at various depths within the profile may have marked individual living floors. He concluded that this assemblage represented a very Late Archaic occupation with Woodland influences.

The second horizon, or Zone B, extended from 1.0 to 1.5 m below the surface. The only diagnostic artifacts from Zone B were a triangular blade or large point and the base of a large stemmed point. A basin shaped pit containing charcoal, burnt clay and limestone and a trash midden were the only features present in this zone (Witty 1963). Witty concluded that this zone represented an unspecified Archaic occupation.

In summary, the Kansas State Historical Society's work indicated that 14CY301 probably represented a campsite used by a small group of people intermittently over a long period of time during the Plains Archaic and transitional Plains Archaic/Plains Woodland periods.

14CY301 was relocated in the survey of the Quimby Creek Area in 1982. At the time, the site was in a recently plowed field with a surface visibility of 90 to 100 percent. Results of the survey indicated that 14CY301 covered a substantially larger area than the locale tested in 1961. Based on the extent and results of the previous test excavations, the 1982 investigation was restricted to site mapping and surface collection. These investigations resulted in the definition of three distinct concentrations of surface artifacts which were designated as Areas I, II and III (Figure 16). Area I consists of the locale investigated by Witty in 1961. The surface scatter in this area contains a light to moderate lithic scatter extending over 1200 sq m. A total of 75 artifacts were recovered from Area I. Area II is situated 20 m south of Area I and consists of a light to moderate lithic scatter extending over 1120 sq m. A total of 55 artifacts were recovered from Area II. Area III is located 140 m west of the southern border of Area I and consists of a very light lithic scatter extending over an area of 1310 sq m. A total of 11 artifacts were recovered from Area III.

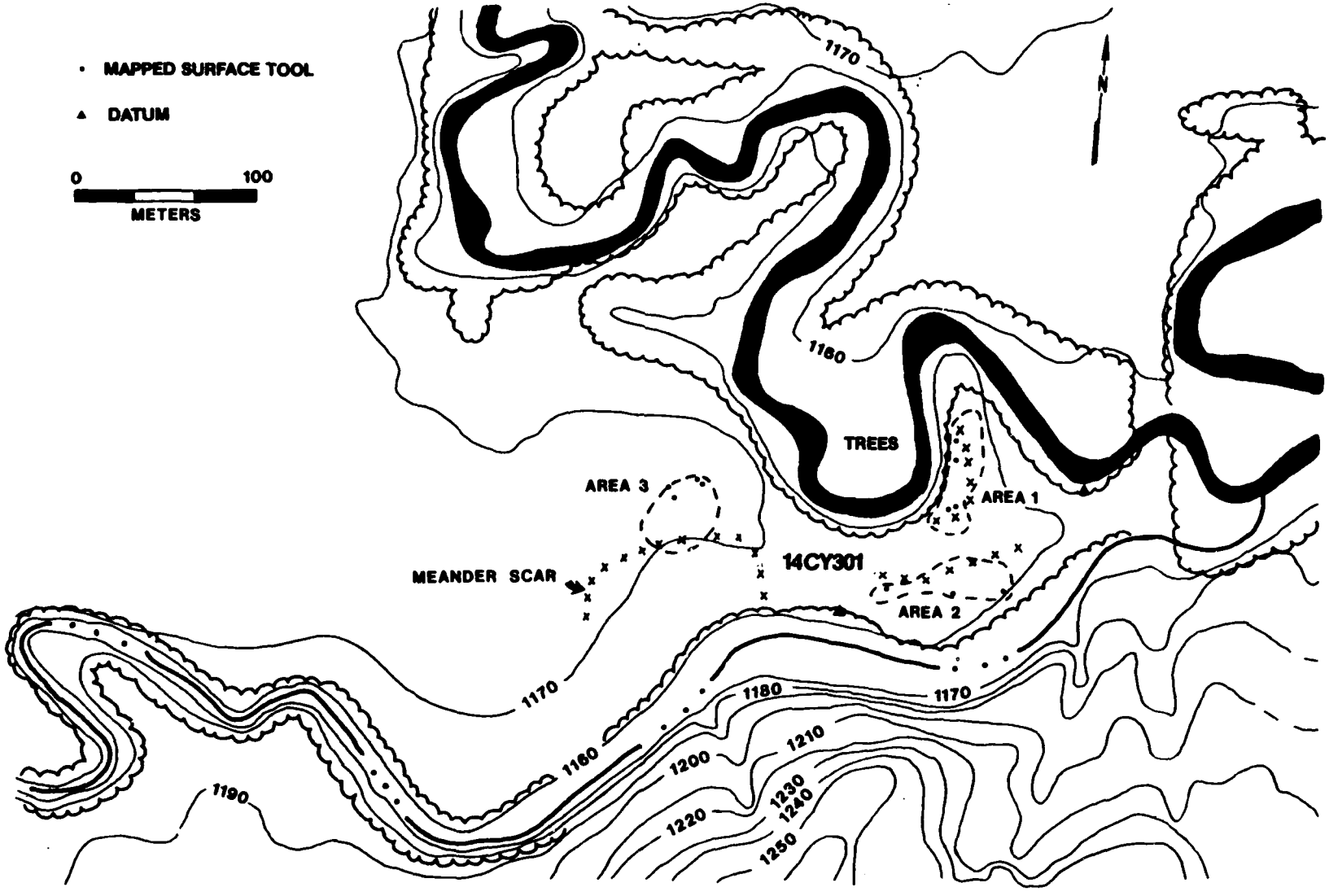



Figure 16. Location and plan view of test excavations at 14CY301.

## Soil Stratigraphy

Site 14CY301 is located on a T-1 terrace of Quimby Creek. A levee deposit blankets the T-1 sediments along the northern fringe of the site, and there are several distinct meander scars on the T-1 surface. The northern branch of Quimby Creek is cutting back into the T-1 deposit along the western side of Quimby Creek. It is likely that flooding in this channel results in both the removal and deposition of sediments on the T-1 surface.

The soils at 14CY301 are mapped as Hobbs silt loam in the preliminary soil survey for Clay County. The Hobbs series consists of deep, well-drained soils on floodplains and level deposits of creeks and small drainageways. At 14CY301, the Hobbs soils appear to be associated with the level deposit on the T-1 surface. A bucket auger was used to examine these soils in Area I. The soils are characterized by a dark gray silty loam A horizon approximately 20 cm in thickness overlying a dark grayish brown silty loam C horizon in these sediments indicates that the level deposit is relatively young. The T-1 sediments beneath the level deposit were not reached with the bucket auger.

## Artifact Assemblage

A total of 141 artifacts were recovered from the 1982 investigations at 14CY301 (Table 15). All artifacts were from the surface, since no test units were excavated. Included in the inventory are chipped stone tools, lithic manufacturing debris, ground stone tools, unworked stone and unworked bone.

Chipped stone tools include one drill, two bifacial knives, three bifacial blanks, seven scrapers, one perforator, 19 edge-modified flakes and two edge-modified chunks. The drill was from Area I and is an unheated medial fragment made from local blue chert with step fracture wear present on both lateral edges (Figure 17a). Both bifacial knives are from Area II. One is a complete specimen made from heated gray chert which exhibits heavy attritional wear along the straight lateral margin and intentional dulling of the opposite edge providing a backing (Figure 17b). The second bifacial knife is a fragment made from unheated white chert with a diagonal fracture (Figure 17c). Attritional wear is visible on the working edge of the tool. All three bifacial blanks are fragments of local blue, gray or brown chert recovered from Area I. Two of the fragments are unheated light-duty bifaces that exhibit transverse breaks. The third is a heated fragment of a heavy-duty blank.

The seven scrapers recovered from 14CY301 include one specimen from Area I, four from Area II and two from Area III. The Area I specimen is a unifacial end scraper. One of the four scrapers from Area II is a small marginally retouched blade (Figure 17d), one is a marginally retouched chunk and two appear to be fragments of unifacial end scrapers. Both of the scrapers recovered from Area III are marginally retouched end scrapers that show no sign of heat treatment. All are made from local gray chert.

Table 15. Artifact assemblage from 14CY301.

| | Area I Surface | Area II Surface | Area III Surface | TOTAL |
|---|---|---|---|---|
| CHIPPED STONE TOOLS | | | | |
| Drills | 1 | | | 1 |
| Bifacial Knives | | 2 | | 2 |
| Bifacial Blanks | 3 | | | 3 |
| Scrapers | 1 | 4 | 2 | 7 |
| Perforators | 1 | | | 1 |
| Edge-Modified Flakes | 8 | 7 | 4 | 19 |
| Edge-Modified Chunks | 1 | 1 | | 2 |
| Total | 15 | 14 | 6 | 35 |
| LITHIC MANUFACTURING DEBRIS | | | | |
| Chunks | 9 | 5 | | 14 |
| Flakes | 31 | 30 | 3 | 64 |
| Shatter | 19 | 5 | | 24 |
| Total | 59 | 40 | 3 | 102 |
| GROUND STONE TOOL | | | 1 | 1 |
| UNWORKED STONE | | 1 | 1 | 2 |
| UNWORKED BONE | 1 | | | 1 |
| TOTAL | 75 | 55 | 11 | 141 |

One perforator was recovered from Area I. The tool has been steeply retouched on the dorsal surface of the flake creating a narrow projection. The specimen is made from local unheated gray chert and has a diagonal fracture near its proximal end (Figure 17e).

The 21 edge-modified tools include 19 edge-modified flakes and two edge-modified chunks. Eight modified flakes and one modified chunk were from Area I, seven modified flakes and one modified chunk from Area II, and four modified flakes from Area III. Only two specimens appear to have been thermally altered. All but one are locally available gray

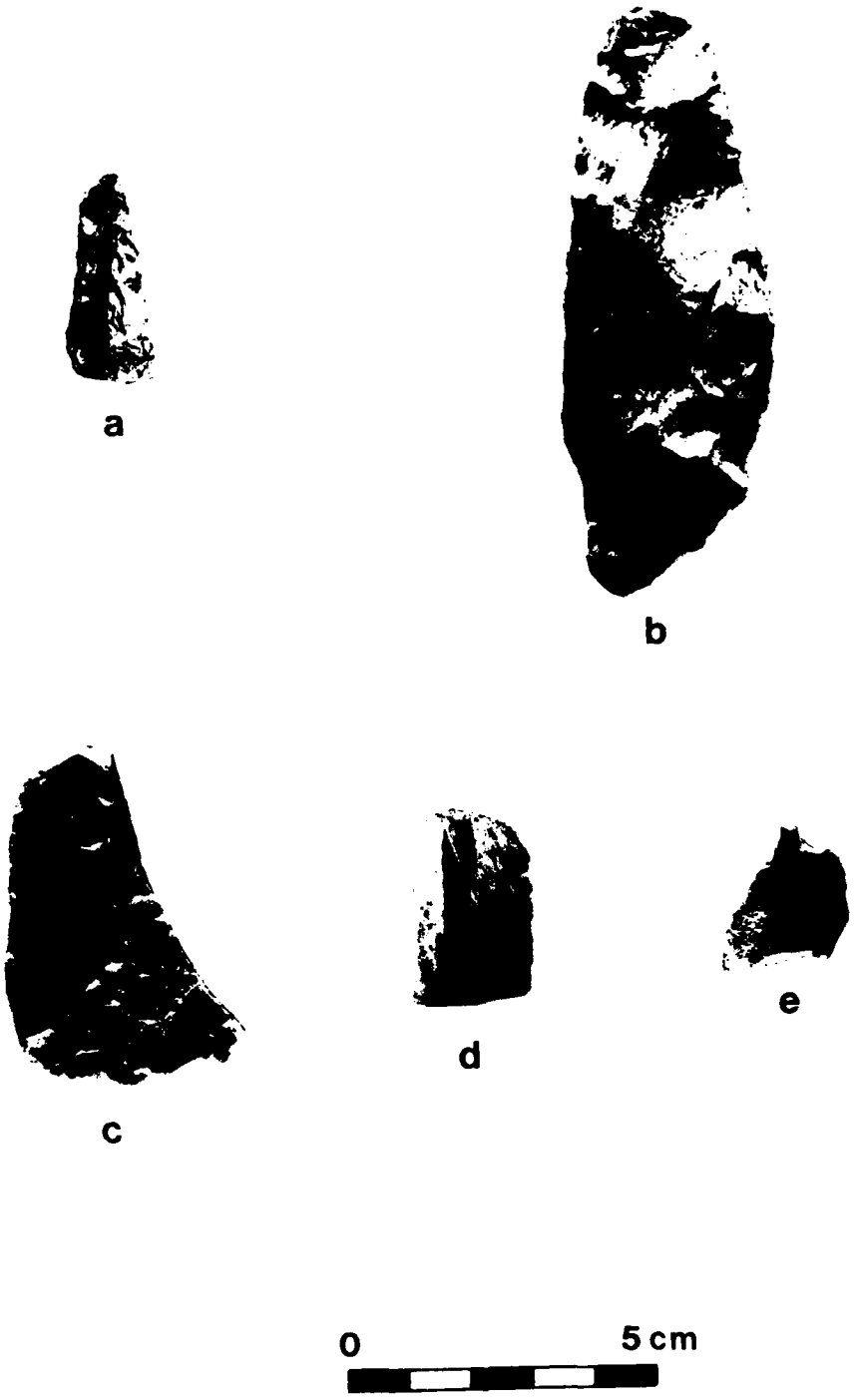



Figure 17. Artifacts from 14CY301: a, drill; b-c, bifacial knives; d, scraper; e, perforator.

cherts. One mano was recovered from Area III. The tool exhibits both smoothing and pecking indicative of use as a grinding implement.

Lithic manufacturing debris from 14CY301 includes 14 chunks, 64 flakes and 24 pieces of shatter. Nine chunks are from Area I and five from Area II. Of the 64 flakes recovered, 31 are from Area I, 30 from Area II and three from Area III. Nineteen pieces of shatter were recovered from Area I and five were recovered from Area II. One piece has been thermally altered. Except for two pieces of white chert, all the lithic manufacturing debris is made from local gray and brown cherts. Two pieces of unworked stone and one piece of unworked bone were also recovered from 14CY301. The unworked bone was recovered from Area I, while one unworked stone is from Area II and a second from Area III.

## Discussion and Recommendations

14CY301 is a large site with three distinct occupational areas designated as Areas I, II and III. Area I was extensively tested by the Kansas State Historical Society in 1961 (Witty 1963). These investigations indicated that 14CY301 was a stratified site containing two occupational zones designated as Zones A and B. Zone A extends from the surface to a depth of 76 cm and contained large stemmed and corner-notched points as well as ceramics. Witty suggested a transitional very late Archaic/Plains Woodland cultural affiliation for this component. Zone B extended from 1.0 to 1.5 m below surface. No ceramics were recovered from this level which dates to the Plains Archaic period.

Based on the 1961 testing, it was determined that further subsurface investigations were not warranted. This earlier work demonstrated the significance of the site and any further excavations would have only damaged the site. The 1982 investigations delineated two areas of lithic scatter in addition to the area tested by Witty in 1961. Based on the proximity to Area I and the similar geomorphic setting, Areas II and III likely represent continuations of the Zone A deposits defined in 1961. These deposits appear to date to the Late Archaic or a transitional Late Archaic/Plains Woodland period.

The chipped stone tool assemblage indicates that similar activities were conducted in both Areas I and II. These activities include light-duty cutting and scraping tasks which were probably the result of butchering and hide preparation. The chipped stone tools from Area III are associated with scraping tasks and this area may be a more specialized activity locale associated with hide preparation. The presence of a mano may also indicate plant food preparation. The results of the 1982 investigations tend to support Witty's (1963) interpretation that the site functioned as a residential camp.

The results of the combined 1961 and 1982 investigations indicate that the Avery site consists of three distinct, although probably related areas. Substantial intact subsurface deposits are located in Area I and are likely present in Areas II and III. Based on the paucity of data on Late Archaic cultural history and subsistence-settlement patterns for

the project area, and on the presence of substantial intact subplowzone deposits, 14CY301 is recommended to be eligible for the National Register. It is recommended that the field in which 14CY301 is located be taken out of agricultural production to prevent further damage resulting from agricultural practices. The site is also being impacted by the cutbank of Quimby Creek which is encroaching on the western side of Area I. This cutbank should be monitored periodically to determine if cultural deposits are being eroded by Quimby Creek. If this is the case, the site should be stabilized or limited data recovery should be undertaken at this threatened area.

## 14CY304

This site was first located during the 1982 survey and consists of a light lithic scatter on a prominent knoll on the T-0 floodplain just south of Cane Creek (Figure 18). The site covers an area of about 1600 sq m. Two transects of one by one m test units were laid out running north to south and east to west. The five test units were placed at 25 m intervals and excavated to a depth of 80 cm. No cultural material was located in any of the test units.

### Soil Stratigraphy

14CY304 is located on soils mapped by the Clay County Soil Survey as Muir silt loam. This soil forms on terrace deposits of silty alluvium. All of the test units at 14CY304 exhibited similar profiles. Cultural materials were found only on the surface. The profile of Test Unit 5 is presented below.

| | | |
|---|---|---|
| Ap | 0-25 cm | Very dark grayish brown (10YR3/2) silt loam; granular structure. |
| A | 25-50 cm | Very dark grayish brown (10YR3/2) silt loam; fine subangular blocky structure. |
| Bw1 | 50-80+cm | Very dark gray (10YR3/1) silty clay loam; subangular blocky structure. |

### Artifact Assemblage

The artifact assemblage from 14CY304 consists of a total of 22 artifacts recovered from the surface. Included are chipped stone tools, lithic manufacturing debris and unworked stone. One scraper and two edge-modified flakes constitute the chipped stone tool assemblage. The scraper is a small marginally retouched chunk that exhibits a small amount of cortex. Step fracture wear is present on the two beveled retouched edges. The two edge-modified flakes exhibit step fracture wear. Neither the scraper nor the edge-modified flakes were thermally

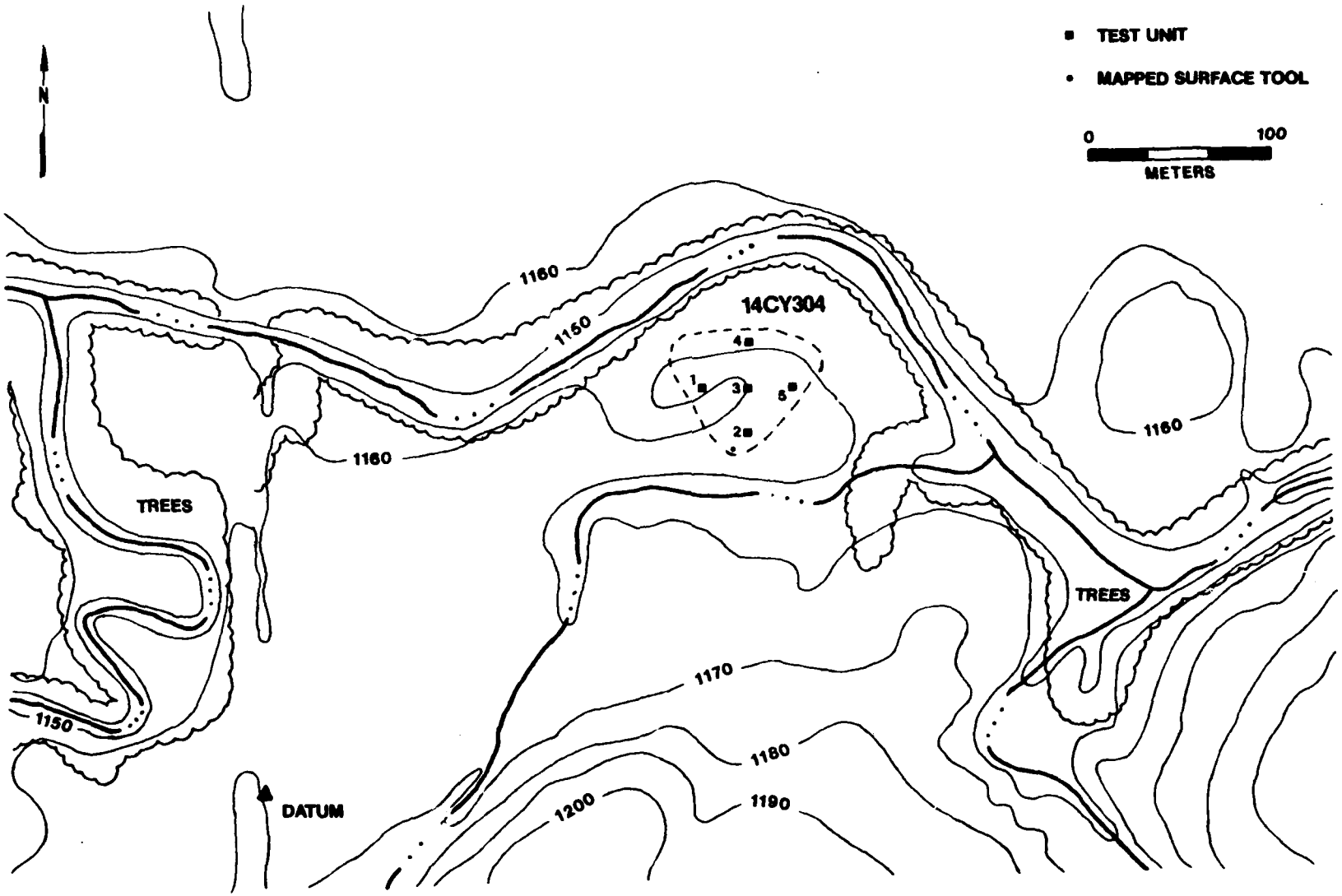



Figure 18. Location and plan view of test excavations at 14CY304.

altered. All appear to be local gray and brown cherts. The 18 pieces of lithic manufacturing debris include nine flakes and nine pieces of shatter. Five pieces have been heated and all but one are locally available gray or brown cherts. Only one piece of unworked stone was recovered from the site.

### Discussion and Recommendations

14CY304 is a small limited-use site located on the floodplain of Cane Creek. No diagnostic artifacts are present, and cultural affiliation cannot be determined. Activities which occurred at the site include scraping, as indicated by the marginally retouched scraper, and lithic tool manufacture, as indicated by the preponderance of decortication debris. Based on the small quantity of cultural materials and lack of intact subsurface cultural deposits, 14CY304 is not recommended to be eligible for the National Register.

## 14CY305

14CY305 is a small light lithic scatter situated on the T-1 terrace of Otter Creek (Figure 19). At the time of the survey, the site had a surface visibility of 100 percent allowing clear delineation of the site which extended over a 1660 sq m area. Testing consisted of an intensive surface collection and mapping along with the excavation of five test units. Crop cover at this time consisted of waist high soybeans and surface visibility was approximately 30 percent (Figure 20). The surface collection was made by walking the rows of beans and flagging artifacts which were then mapped and collected. Two test unit transects were laid out within the confines of the defined surface scatter. The north-south transect used a 25 m interval, while 10 m intervals separated the test units in the east-west transect. Test Units 2, 4 and 5 were excavated to 80 cm, while Test Units 1 and 3 were excavated to a depth of 60 cm. All test units except Test Unit 3 were culturally sterile. The small number of artifacts recovered from Test Unit 3 were located in the plowzone.

### Artifact Assemblage

The small artifact assemblage from 14CY305 includes chipped stone tools, ground stone tools, lithic manufacturing debris and unworked stone (Table 16). Chipped stone tools include seven scrapers and three edge-modified flakes. All of the scrapers are end scrapers. Six were recovered from the surface and one was recovered from the plowzone in Test Unit 3. One specimen exhibits a retouched notch, indicating additional use as a spokeshave. Three edge-modified flakes were recovered from the site's surface. All three exhibit step fracture wear and planoclinal edge shapes, indicating their use in scraping tasks. All of the chipped stone tools are unheated local gray or brown cherts.

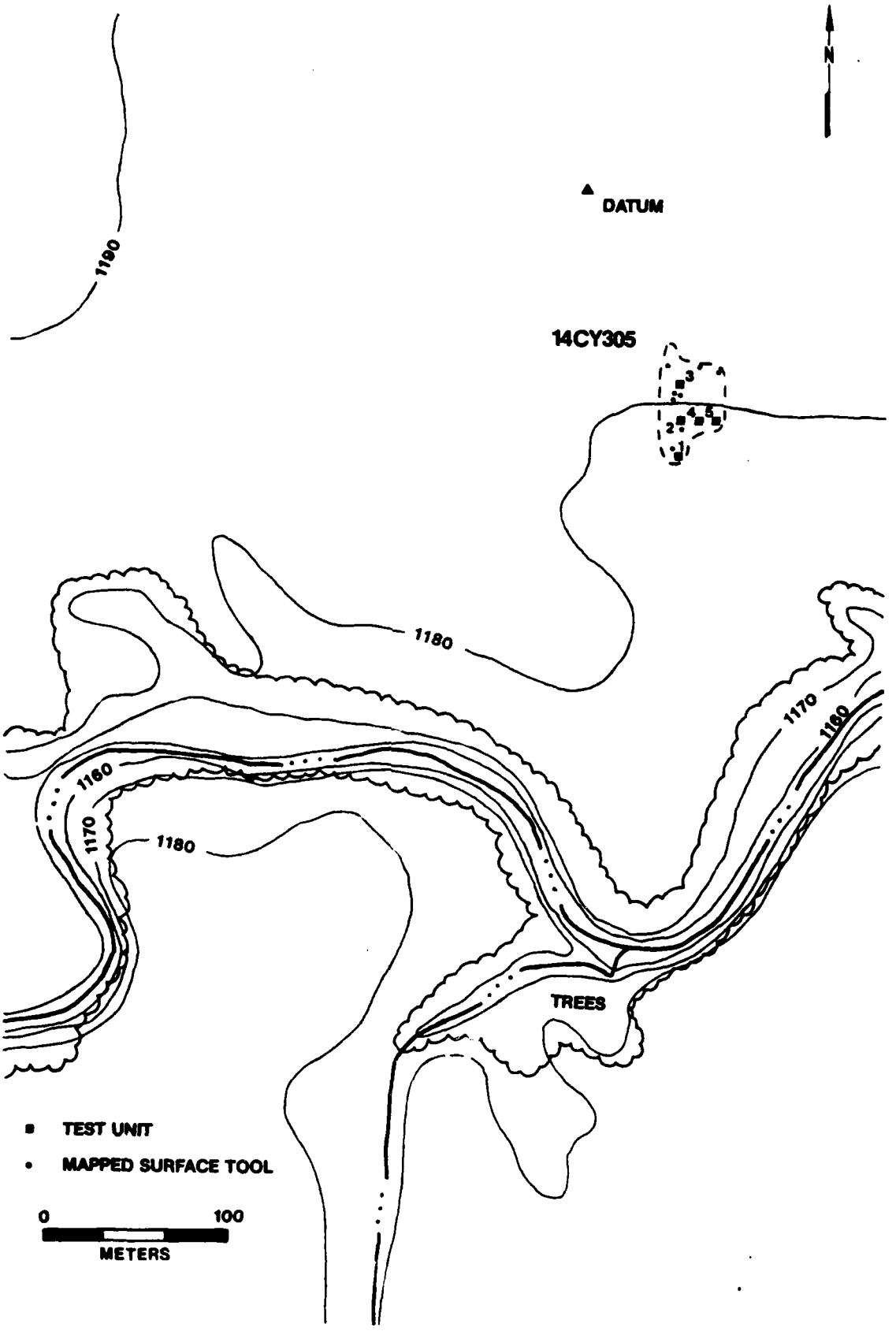



Figure 19. Location and plan view of test excavations at 14CY305.



Figure 20. General views of 14CY305 and 14CY306. View looking to the east of 14CY305 (upper) and view to the east of 14CY306 (lower).

Table 16. Artifact assemblage from 14CY305.

| | Test Unit 3 | Surface | TOTAL |
|---|---|---|---|
| CHIPPED STONE TOOLS | | | |
| Scrapers | 1 | 6 | 7 |
| Edge-Modified Flakes | | 3 | 3 |
| Total | 1 | 9 | 10 |
| LITHIC MANUFACTURING DEBRIS | | | |
| Chunks | | 3 | 3 |
| Flakes | | 6 | 6 |
| Shatter | | 9 | 9 |
| Total | | 18 | 18 |
| GROUND STONE TOOLS | | 2 | 2 |
| UNWORKED STONE | 1 | 11 | 12 |
| TOTAL | 2 | 40 | 42 |

Two hammerstones were recovered from the surface. Both are fragments of waterworn cobbles which exhibit battering scars on the perimeter of the tool. Eighteen pieces of lithic manufacturing debris were recovered from the site including three chunks, six flakes and nine shatter. All 18 were recovered from the surface. Except for one piece of white chert, all of the manufacturing debris is local brown or gray cherts. Only one piece has been heated. Twelve pieces of unworked stone make up the balance of the assemblage. One was recovered from the plowzone of Test 3 and eleven were collected from the surface.

## Discussion and Recommendations

14CY305 is a small light lithic scatter located on the T-1 terrace of Otter Creek. No subplowzone cultural debris was recovered from the site. The presence of several scrapers indicates that hideworking probably occurred at this site. However, the lack of diagnostic tools from 14CY305 precludes a determination of the cultural affiliation of the site. Based on this consideration and a lack of intact subsurface deposits, the site is not recommended to be eligible for the National Register.

## 14CY306

14CY306 is situated on the T-0 floodplain about 50 m east of 14CY36 (Figures 10 and 20). A small swale separates the two sites. The site, which was first located during the 1982 survey, was defined as a light to moderate lithic scatter extending over an area of 6750 sq m. Test excavations consisted of an intensive surface collection and excavation of six one by one m test units. All surface artifacts were mapped and collected. Test units were placed at 25 m intervals and excavations were taken to a depth of 80 cm below the surface. No intact subplowzone cultural debris was encountered.

### Artifact Assemblage

A total of 212 artifacts were recovered from 14CY306 (Table 17). Nearly all of the artifacts (93 percent) are from the surface. Included are chipped stone tools, lithic manufacturing debris, ground stone tools, unworked stone and burnt rock. The four bifacial tools recovered include three blanks and one biface fragment. One of the blanks is a heavy-duty biface made from unheated yellowish-brown chert (Figure 12d). The other is a light-duty biface made from unheated gray chert (Figure 12e). The biface fragment is an unheated gray chert. The scraper is a uniface manufactured from an unheated secondary decortication flake of gray chert. Twenty-three of the 24 edge-modified flakes are from the surface. Test Unit 1 yielded a single specimen from the plowzone. Step fracture wear predominates on these tools indicating use as light-duty scraping tools. Three specimens are thermally altered. Three of the specimens are white chert and the remainder are local gray or brown chert.

Lithic manufacturing debris from 14CY306 includes nine chunks, 56 flakes and 70 pieces of shatter. With the exception of two pieces of shatter recovered from the plowzone of Test Unit 1, all of the manufacturing debris was located on the surface. Forty-seven pieces of unworked stone and one piece of burnt rock were recovered from the site. Thirty-six unworked stones and burnt rock were found on the surface. One unworked stone is from Test Unit 1, five are from Test Unit 3, two from Test Unit 5 and three from Test Unit 6. All of the unworked stone recovered from the test units was from the plowzone. Ten pieces of manufacturing debris are white chert and the rest are gray to brown chert. Only five pieces of debris were heated.

### Discussion and Recommendations

14CY306 is a surficial cultural deposit situated on the floodplain of Quimby Creek. The site consists of a light to moderate lithic scatter consisting mainly of lithic manufacturing debris. Excavation of six one by one m test units failed to locate intact subplowzone deposits. The close proximity of the site to 14CY36 may indicate that the two sites are related. However, the lack of diagnostic artifacts from either site precludes interpretation regarding the cultural

Table 17. Artifact assemblage from 14CY306.

| | Test Units | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|
| | 1 | 3 | 5 | 6 | | |
| CHIPPED STONE TOOLS | | | | | | |
| Bifacial Blanks | | | | | 3 | 3 |
| Biface Fragment | | | | | 1 | 1 |
| Scraper | | | | | 1 | 1 |
| Edge-Modified Flakes | 1 | | | | 23 | 24 |
| Total | 1 | | | | 28 | 29 |
| LITHIC MANUFACTURING DEBRIS | | | | | | |
| Chunks | | | | | 9 | 9 |
| Flakes | | | | | 56 | 56 |
| Shatter | 2 | | | | 68 | 70 |
| Total | 2 | | | | 133 | 135 |
| BURNT ROCK | | | | | 1 | 1 |
| UNWORKED STONE | 1 | 5 | 2 | 3 | 36 | 47 |
| TOTAL | 4 | 5 | 2 | 3 | 197 | 212 |

affiliation, or possible relationships between them. Light-duty scraping tasks are interpreted to have occurred at 14CY306 because of the number of edge-modified flakes present. Tool manufacture and maintenance is also indicated by the presence of the lithic manufacturing debris. Based on the absence of diagnostic artifacts and lack of intact subsurface deposits, 14CY306 is not considered eligible for the National Register.

## 14DN325

14DN325 lies on the floodplain of Curtis Creek approximately 4.8 km upstream from its confluence with the Republican River (Figure 21). The site, located during the 1982 survey, consists of a light lithic scatter extending over an area of about 5160 sq m. Test investigations included an intensive surface collection coupled with the excavation of eight one

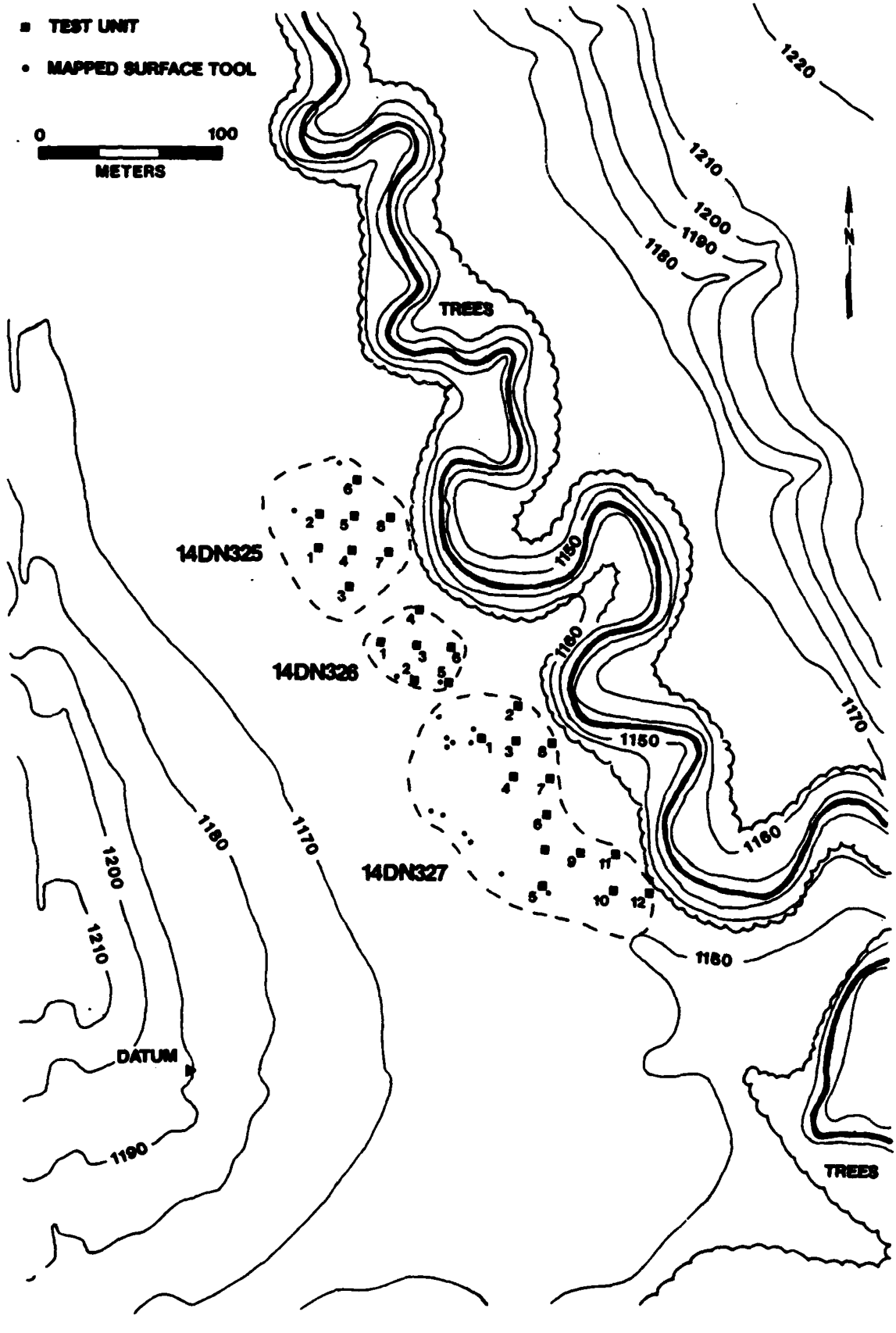



Figure 21. Location and plan view of test excavations at 14DN325, 14DN326 and 14DN327.



Figure 22. General view of site 14DN325, 14DN326, 14DN327 and 14DN328. View to the northwest of 14DN325, 14DN326 and 14DN327 (upper). View to the south of testing in progress at 14DN328 (lower).

by one m test units. Surface artifacts were located, mapped and collected. Three test unit transects, oriented north to south, were laid out at 20 m intervals. Excavations were terminated in each test unit when sterile subsoil was reached. Cultural features were encountered below the plowzone in three of the eight test units and were designated as Features 1, 3 and 5.

## Soil Stratigraphy

Site 14DN325 and immediately adjacent sites 14DN326 and 14DN327 are located along the edge of the T-1 terrace of Curtis Creek (Figure 22). Within the area of the three sites, the T-1 surface is approximately one meter above the surface of the adjacent T-0 floodplain of the creek. The boundary between the T-0 and T-1 deposits is marked by a conspicuous scarp.

The soils at 14DN325, 14DN326 and 14DN327 are mapped in the Dickinson Soil Survey as the Muir silt loam (Jantz and Jaffry 1980). The Muir soil is typified by a very dark grayish brown silty loam A horizon overlying a brown or grayish brown B horizon. The B horizon may be as much as 100 cm thick, but it does not meet the specifications of an argillic horizon. The C horizon is usually a brown or dark grayish brown, calcareous, silty clay loam. The profile of a test unit in the T-1 sediments at 14DN325 is presented below.

| | | |
|---|---|---|
| Ap | 0-20 cm | Very dark grayish brown (10YR3/2) silt loam; moderate, fine, granular structure, friable; few fine roots; gradual, smooth boundary. |
| A1 | 20-35 cm | Very dark grayish brown (10YR3/2) silt loam; moderate, fine, granular structure; slightly hard; friable; few fine roots; clear, smooth boundary. |
| B1 | 35-50 cm | Brown (10YR4/3) silty clay loam; moderate, fine, granular structure and moderate, very fine, subangular blocky structure; firm; gradual, smooth boundary. |
| B21 | 50-73 cm | Dark brown (10YR3/3) silty clay loam; moderate, fine, and very fine, subangular blocky structure; firm; clear, smooth boundary. |
| B22 | 73-95 cm | Dark brown (10YR3/3) silty clay loam; moderate, fine, subangular blocky structure; firm; clear smooth boundary. |
| C | 95-150+cm | Brown (10YR4/3) silty clay loam with an occasional single coarse sand grain; weak, fine, subangular blocky structure; few fine threads of $CaCO_3$. |

## Cultural Features

Feature 1 consisted of a hearth located just below the plowzone in Test Unit 4 (Figure 23). The hearth was initially encountered at a depth of 24 cm below surface and consisted of a cluster of burnt limestone cobbles and associated charcoal. The hearth was circular in plan view and extended into the northern and eastern walls of the test unit. Charcoal was recovered from the hearth for radiocarbon dating. The feature was exposed sufficiently to allow description and documentation with the remainder left undisturbed. A metal datum disc 4 cm in diameter was placed within the feature and the test unit was backfilled.

Feature 3 was a burnt rock hearth located in the southwestern corner of Test Unit 3 at a depth of 28 cm below the surface (Figure 23). The hearth was circular in plan view and extended into the western and southern walls of the unit. The hearth extended to a depth of 40 cm. Due to the limited amount of charcoal present, a sample sufficient for radiocarbon dating was unobtainable. While the hearth appears to continue deeper into the profile, excavations were not continued deeper than necessary for accurate description and photographic documentation. This allowed the feature to remain intact and undisturbed. A small metal disc was added to the feature and the test unit was then backfilled.

Feature 5 consisted of four burnt limestone cobbles located in a cultural midden at a depth of 80 cm below the surface in the eastern half of Test Unit 7 (Figure 24). The midden consisted of small flecks of charcoal and burnt earth. In order to expose the feature for documentation, the unit was excavated to a depth of 85 cm. Maps were then drawn and the feature photographed. Following this, the excavation was continued to a depth of one meter below the surface. One flake, one piece of shatter and one burnt rock were recovered from this level. The feature fill was retained for flotation.

## Radiocarbon Date

The sample of charcoal from Feature 1 was submitted to Beta Analytic, Inc. for radiocarbon dating. A date of 750±60 years B.P. (A.D. 1200±60) was obtained from the sample indicating a Plains Village period cultural affiliation for 14CY325.

## Artifact Assemblage

Although three intact cultural features were present at 14DN325, the artifact assemblage is quite small (Table 18). A total of 46 (65 percent) of the artifacts are from the test units. Included are chipped stone tools, lithic manufacturing debris, charcoal, unworked stone, unworked bone and burnt rock.

A total of nine chipped stone tools were found including two projectile points, one perforator and six edge-modified flakes. Six of



Figure 23. Features from 14DN325. Feature 1 (upper) and Feature 3 (lower).



Figure 24. Features at 14DN325 and 14DN328. View of Feature 5 at 14DN325 (upper) and view of Feature 1 at 14DN328 (lower).

Table 18. Artifact assemblage from 14DN325.

| | Test Units | | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 7 | 8 | | |
| CHIPPED STONE TOOLS | | | | | | | | |
| Projectile Points | | | | | | | 2 | 2 |
| Perforator | | | | | | | 1 | 1 |
| Edge-Modified Flakes | | | 1 | | 2 | | 3 | 6 |
| Total | | | 1 | | 1 | | 6 | 9 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | |
| Chunk | | | | | | 1 | | 1 |
| Flakes | | | | 4 | 1 | 1 | 8 | 14 |
| Shatter | 1 | | 1 | 1 | 4 | 7 | 9 | 23 |
| Total | 1 | | 1 | 5 | 5 | 9 | 17 | 38 |
| CHARCOAL | | 1 | | | | | | 1 |
| BURNT ROCK | 6 | 1 | | | 9 | 3 | 2 | 21 |
| UNWORKED STONE | | | | | 1 | | | 1 |
| UNWORKED BONE | | | | | 1 | | | 1 |
| TOTAL | 7 | 2 | 2 | 5 | 18 | 12 | 25 | 71 |

these were recovered from the surface. Both projectile points are from the surface. One is a complete, small subtriangular side-notched arrow point with a slightly concave base (Figure 25a). The point has been heated resulting in a pink color. The second specimen is a midsection of a small triangular arrow point made from unheated local gray chert. (Figure 25b). The point is broken at its distal end and has a transverse break near the base. The small side-notched arrow point also indicates a Plains Village Period cultural affiliation for this site.

One fragment of a unifacial perforator was recovered from the surface (Figure 25c). It is made from heated local gray chert. A total of six

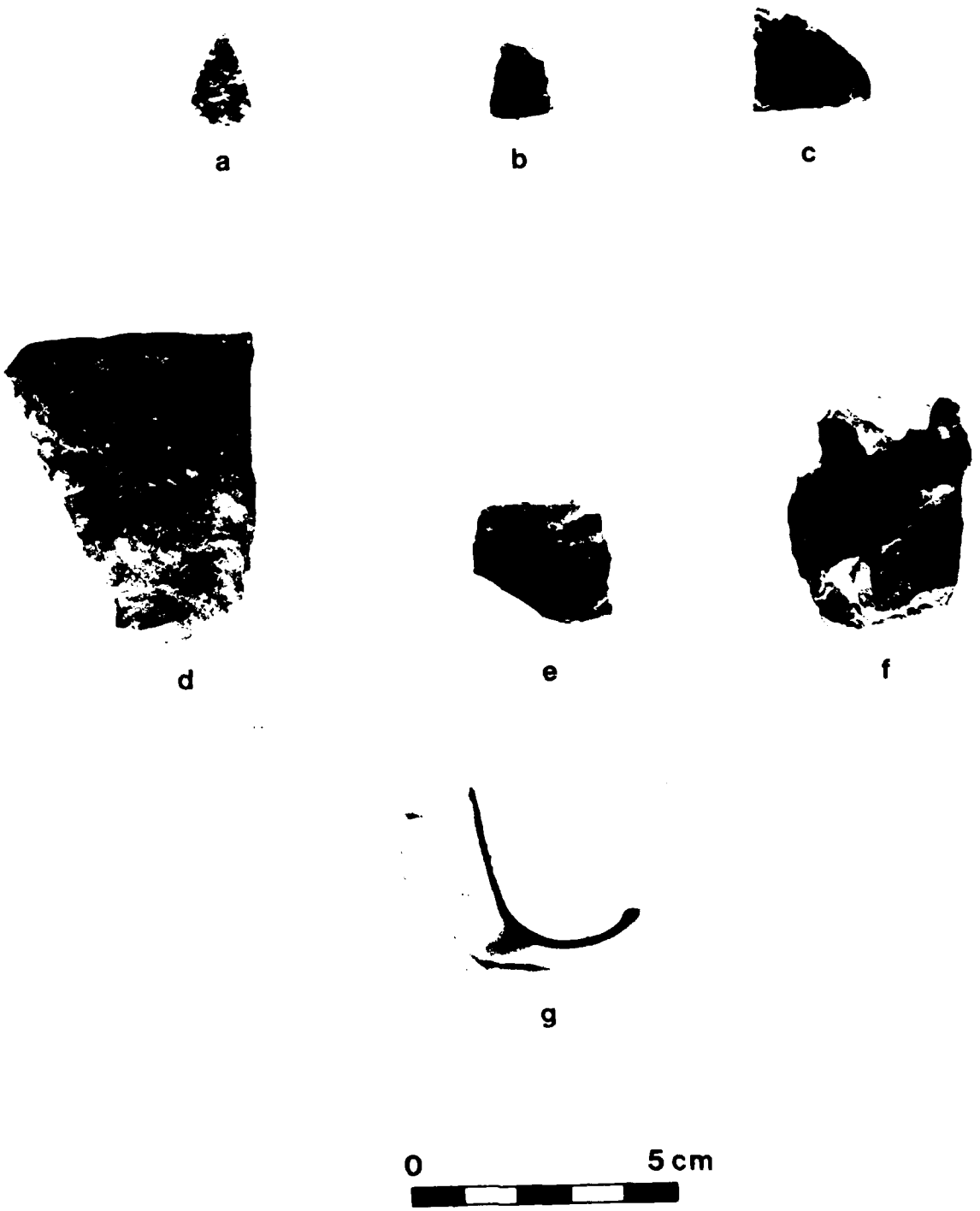



Figure 25. Artifacts from 14DN325, 14DN326, 14DN327 and 14DN328: a-b, projectile points from 14DN325; c, perforator from 14DN325; d, bifacial scraper from 14DN326; e, bifacial knife from 14DN327; f, scraper from 14DN327; g, ceramic cup from 14DN328.

edge-modified flakes were recovered including three from the surface, one from a depth of 53 cm in Test Unit 5 and two from the 20-30 cm level in Test Unit 7. All are manufactured from unheated local gray cherts.

The 38 pieces of lithic manufacturing debris include one chunk, 14 flakes and 23 pieces of shatter all of local gray chert. The chunk was located in the 20 to 40 cm level of Test Unit 8. Eight of the 16 flakes are from the surface. Test Unit 6 yielded three flakes in the 20 to 40 cm level and one in the 40 to 60 cm level. The flake from Test Unit 7 was associated with Feature 5 at a depth of 80 to 90 cm, while the flake in Test Unit 8 was from the plowzone. Only one of the flakes was heated. A total of 23 pieces of shatter were recovered including nine from the surface and 14 were from the test units. Two specimens were heated.

Twenty-one pieces of burnt rock were recovered from the site. Ninety percent of this material was from the features. One unworked stone and a small piece of unworked bone were also found in Test Unit 7.

## Discussion and Recommendations

14DN325 is an intact buried site located in the floodplain sediments of Curtis Creek. Based on the radiocarbon date of 750±60 years B.P. and the recovery of a small side-notched arrow point, a Plains Village period cultural affiliation is indicated for this site. The Smoky Hill phase is the local Plains Village manifestation. However, due to the lack of ceramics from 14DN325, assignment of the component to the Smoky Hill phase must remain tentative.

The majority of the artifacts from 14DN325 were from below the plowzone, indicating that a substantial portion of the site is buried and intact. This is further substantiated by the presence of three burnt limestone hearths from below the plowzone. The side-notched arrow point and a fragment of a second arrow point suggests that hunting activities took place, while light-duty cutting and scraping tasks are evidenced by the edge-modified flakes. The occurrence of food preparation is indicated by the hearths. Based on the limited range of tool types, all of which are associated with butchering and scraping activities, 14DN325 is interpreted to be a Plains Village hunting camp. This interpretation is supported by the absence of a thick cultural midden, ceramics and tools associated with plant food processing. Based on the presence of intact subsurface cultural deposits and features, and

the site's importance as an example of a poorly understood component of the Plains Village settlement pattern, 14DN325 is recommended to be eligible for the National Register. It is recommended that the site area be taken out of agricultural production to protect it from agricultural disturbance.

## 14DN326

14DN326 is located on the T-1 terrace of Curtis Creek just south of 14DN325 (Figure 21). A natural swale dissects and separates the two sites. At the time of the 1982 survey, 14DN326 consisted of a small concentration of burnt limestone cobbles and lithic debris. The test investigations indicated that the site actually covered an area of about 1780 sq m.

Testing included an intensive surface collection along with the excavation of six one by one m test units to a depth of 80 cm below the surface. All surface artifacts were mapped and collected. Although no features were encountered, subplowzone cultural debris was located in Test Units 1 and 6 at the same stratigraphic level as the intact features at 14DN325. Evidence of cultural midden consisting of flakes, charcoal and burnt earth was noted between 25 and 40 cm below surface in Test Unit 1. A charcoal sample was collected from these deposits in Test Unit 1, which is the unit closest to 14DN325. Because of the close proximity of the two sites and the similarity in subplowzone material, it is probable that the two sites are related. However, no diagnostic artifacts were recovered from 14DN326 to enable a clear delineation of the relationship between the two sites.

### Radiocarbon Date

The wood charcoal recovered from a depth of 25 to 40 cm below the surface in Test Unit 1 was submitted to Beta Analytic, Inc. for dating. This sample yielded a date of 860±80 years B.P. (1090±80 A.D.) and confirms the inferred Plains Village period affiliation of 14DN326. Although this date is potentially more than 100 years earlier than the date from 14DN325, the two occupations may have occurred at the same time, since the standard deviations of the two dates overlap.

### Artifact Assemblage

The artifact assemblage from 14DN326 consists of 11 specimens from the test units and 17 from the surface (Table 19). Included are chipped stone tools, lithic manufacturing debris, charcoal and burnt rock. The three chipped stone tools recovered from the surface of the site include one bifacially worked side scraper, one edge-modified flake and an edge-modified chunk. The bifacial side scraper (Figure 25d) consists of two fragments of unheated local gray chert which cross-mend. Transverse breaks are present on both the distal and proximal ends. The

Table 19. Artifact assemblage from 14DN326.

| | Test Units 1 | 2 | 4 | Surface | TOTAL |
|---|---|---|---|---|---|
| CHIPPED STONE TOOLS | | | | | |
| Scraper | | | | 1 | 1 |
| Edge-Modified Flake | | | | 1 | 1 |
| Edge-Modified Chunk | | | | 1 | 1 |
| Total | | | | 3 | 3 |
| LITHIC MANUFACTURING DEBRIS | | | | | |
| Chunks | | 1 | 1 | 1 | 3 |
| Flakes | 1 | | | 3 | 4 |
| Shatter | | | | 5 | 5 |
| Total | 1 | 1 | 1 | 9 | 12 |
| CHARCOAL | 1 | | | | 1 |
| BURNT ROCK | 4 | | 2 | 6 | 12 |
| TOTAL | 6 | 1 | 3 | 18 | 18 |

planoclinal edge shape and visible step fracture wear along both edges indicate that the tool functioned as a scraper. It was not heat treated. The two edge-modified tools consist of an edge-modified flake which exhibits step fracture wear on two edges and an edge-modified chunk with step fracture wear on one edge. Both tools are unheated local gray cherts.

Lithic manufacturing debris includes 12 artifacts consisting of three chunks, four flakes and five pieces of shatter; all are made of local gray chert. One chunk was from the surface and two were from the test units. All of the chunks are cortical and lack heat treatment. Three of the four flakes were surface finds, while the fourth was from Test Unit 1. None of the flakes were thermally altered. All five pieces of shatter were recovered from the surface and none were heated.

Twelve pieces of burnt rock were recovered from 14DN326. Four pieces were located in the 20 to 40 cm level of Test Unit 1, two from below the plowzone in Test Unit 5 and six from plowzone or surface.

## Discussion and Recommendations

14DN326 is a light concentration of lithics and burnt rock located near 14DN325. The two sites are separated by a shallow swale about 30 m in width. The lithic assemblage suggests that the site represents a limited-use activity area, primarily involving scraping activities. The subplowzone cultural debris at 14DN326 is very similar to that from 14DN325. Burnt rock scatters, lithic debris and charcoal were located at 14DN326 in the same stratigraphic position as at 14DN325. The radiocarbon dates from the two sites indicate that 14DN325 and 14DN326 are temporally related. Although the date from 14DN326 is 130 years older than the sample recovered from 14DN325, the large standard deviation suggests that the two sites may represent contemporaneous or nearly contemporaneous occupations. As a consequence, 14DN326 is considered eligible for nomination to the National Register. It is further recommended that the site be taken out of cultivation to avoid further damage to the intact cultural resources present.

## 14DN327

This site is located south of 14DN326 on the T-1 terrace of Curtis Creek (Figure 21). The site was located during the 1982 survey and consists of a moderate lithic scatter extending over an area of about 10,160 sq m. A natural swale separated the site from 14DN326. This swale becomes broader and deeper as it extends from the east forming the western perimeter of the site. The swale may be an old channel of Curtis Creek or simply a shallow broad gulley.

Test excavations at 14DN327 consisted of an intensive surface collection coupled with the excavation of 13 one by one m test units. All surface artifacts were mapped and collected. Eleven one by one m units were laid out and excavated to a depth of 80 cm. These test units are situated primarily on the higher ground east of the swale. Test Units 5 and 6 were located within the swale and, because of evidence of erosion, were only taken to depths of 40 and 60 cm below the surface, respectively.

Since 14DN327 is located adjacent to 14DN325 and 14DN326, there was a question as to whether the site was related to one or both of the other sites. However, only one test unit contained cultural debris below the plowzone, and no diagnostic artifacts were recovered which would enable a clearer definition of the relationship between the sites.

## Artifact Assemblage

A total of 145 artifacts were recovered from 14DN327 (Table 20). A total of 117 artifacts were recovered from the surface and 28 from the test units. Included are chipped stone tools, lithic manufacturing debris and burnt rock. The 21 chipped stone tools include a biface fragment, three scrapers, and 17 edge-modified flakes. The biface

Table 20. Artifact assemblage from 14DN327.

| | Test Units | | | | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 3 | 4 | 5 | 7 | 8 | 9 | 13 | | |
| CHIPPED STONE TOOLS | | | | | | | | | | |
| Biface Fragment | | | | | | | | | 1 | 1 |
| Scrapers | | | | | | | | | 3 | 3 |
| Edge-Modified Flakes | | 1 | | | | | | | 16 | 17 |
| Total | | 1 | | | | | | | 20 | 21 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | |
| Chunks | 1 | 1 | | | | 1 | | | 18 | 21 |
| Flakes | | 1 | | | | 1 | 1 | | 29 | 32 |
| Shatter | | 1 | 1 | | | 6 | 1 | 2 | 45 | 56 |
| Total | 1 | 3 | 1 | | | 8 | 2 | 2 | 92 | 109 |
| BURNT ROCK | | | | | | | | | 5 | 5 |
| UNWORKED STONE | | | 1 | 2 | 1 | | 5 | 1 | | 10 |
| TOTAL | 1 | 4 | 2 | 2 | 1 | 8 | 7 | 3 | 117 | 145 |

fragment appears to be a midsection of a projectile point or bifacial knife and is made from unheated local brown chert.

The scrapers include three marginally retouched side scrapers. All three are made from local blue cherts. The 17 edge-modified flakes include one from Test Unit 3 and 16 from the surface. Both concave and convex edge shapes are present. The majority exhibit step fracture wear. Five of the modified flakes have been heated and all were manufactured from locally available gray or brown cherts.

Lithic manufacturing debris from 14DN327 consists of 21 chunks, 32 flakes and 56 pieces of shatter. Eighteen chunks were from the surface while three were from test units. Two have been heated and all were derived from local gray chert. Twenty-nine of the flakes were from the surface and three were from test units. One quartzite flake was the only subplowzone cultural item found at 14DN327. It was located in the

60 to 80 cm excavation level of Test Unit 8. Of the fifty-six pieces of shatter, only one is heated and all but 11 were from the surface. With the exception of one flake and one chunk made from white chert, all of the manufacturing debris are local gray chert.

Other debris from the site consists of five small pieces of burnt limestone from the surface and ten small pieces of unworked limestone from various test units at the site.

### Discussion and Recommendations

14DN327 is a light lithic scatter located on the floodplain of Curtis Creek adjacent to 14DN325 and 14DN326. The site is separated from 14DN326 by a swale which forms the site's western edge. 14DN327 appears to have been deflated by erosion. This is substantiated by the lack of subplowzone cultural debris. The presence of a biface fragment, scrapers and edge-modified flakes suggests that light-duty cutting and scraping activities occurred at 14DN327. The debitage also indicates that some tool manufacturing occurred as well. The presence of burnt rock suggests food preparation activities.

Although the cultural affiliation of 14DN327 cannot be determined with certainty, it is highly likely that 14DN325, 14DN326 and 14DN327 are sections of the same site, which have been separated by erosion. If this is the case, then 14DN327 may be significant in terms of its association with the other two locales. Although intact cultural features were not located at 14DN327, diagnostic artifacts, which may further clarify the relationship between the three sites, are probably present. This relationship is significant to understanding Plains Village adaptations along the lower Republican River. 14DN327 is thus considered eligible for the National Register. It is also recommended that the site be taken out of cultivation.

## 14DN328

14DN328 is located on the uplands south of the former channel of Curtis Creek (Figure 26). The site was located during the 1982 survey and consisted of a moderate lithic scatter extending over an area of 11,770 sq m. The site is located within the confines of an historic farmstead that was destroyed at the time of Milford Lake's construction. The farmstead's last recorded owner was Boyd S. Schmutz. The prehistoric component of the site has been severely disturbed both by activities related to the farmstead and by a series of recently constructed agricultural terraces.

Phase II investigations at 14DN328 consisted of an intensive surface collection coupled with the excavation of eight one by one m test units. All surface artifacts were mapped and collected. With the exception of Test Units 2 and 7, the test units were excavated to a depth of 40 cm below the surface. Excavations in Test Unit 2

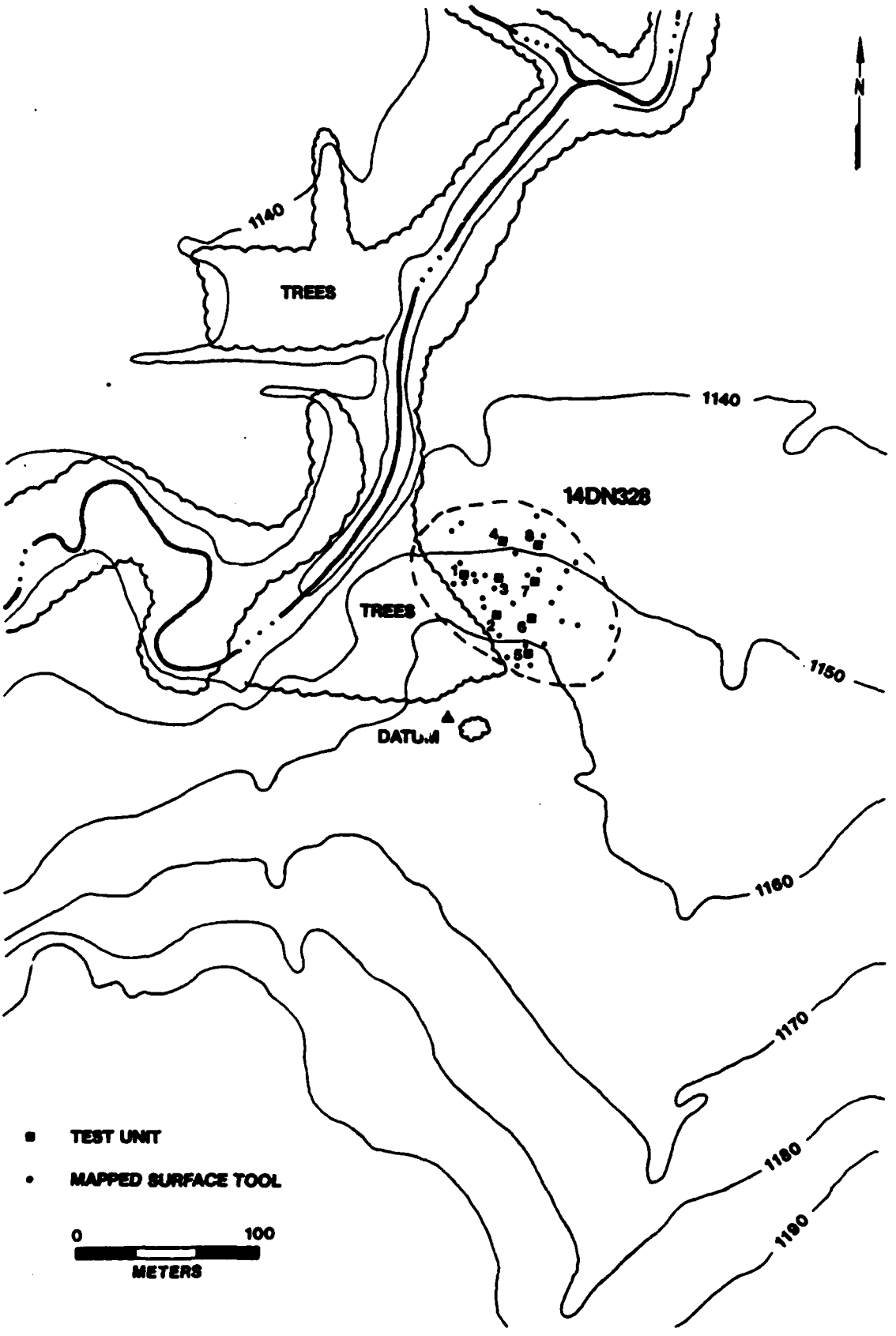



Figure 26. Location and plan view of test excavations at 14DN328.

encountered a corner of one of the historic farmstead out-buildings at a depth of 15 cm and, consequently, were terminated at a depth of 30 cm. Test Unit 7 was excavated to a depth of 60 cm. No cultural debris was located below the plowzone in any of the test units.

## Soil Stratigraphy

14DN328 is located on soils mapped and described by the Dickenson County Soil Survey as the Irwin silty clay loam (Jantz and Jaffry 1980). Irwin soils form on broad ridge tops and side slopes on uplands. All of the test units exhibited similar profiles. Historic and prehistoric artifacts were found only in the Ap horizon. The profile of Test Unit 7 is presented below.

| | | |
|---|---|---|
| Ap | 0-20 cm | Grayish brown (10YR5/2) silt loam; granular structure. |
| B21t | 20-40 cm | Dark grayish brown (10YR4/2) silty clay; blocky structure. |
| B22t | 40-60+cm | Dark yellowish brown (10YR4/6) silty clay; blocky structure. |

## Cultural Feature

The feature located in Test Unit 2 appears to be the northwestern functional corner of an outbuilding associated with the historic occupation of the site. A concentration of limestone cobbles, nails, glass, metal fragments and assorted debris was encountered just above the feature. Once this was cleared, a concentration of limestone rocks similar to foundation material was encountered. Associated artifacts include the fragment of a miniature porcelain tea cup, three nails, seven pieces of animal bone and five pieces of lithic shatter. The tea cup fragment, probably part of a toy, has the entire base and handle still intact (Figure 25g). The seven pieces of shatter are associated with the prehistoric component of the site. The feature was exposed at a depth of 30 cm, mapped and photographed.

## Artifact Assemblage

A total of 235 artifacts were recovered from the site including chipped stone tools, lithic manufacturing debris, unworked stone, burnt rock, burnt clay, unworked bone and historic debris (Table 21). The chipped stone tools include three biface fragments, two scrapers, 35 edge-modified flakes and two edge-modified chunks. All but one of these were found on the surface of the site.

Table 21. Artifact assemblage from 14DN328.

| | Test Units | | | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| CHIPPED STONE TOOLS | | | | | | | | | |
| Biface Fragments | | | | | | | | 3 | 3 |
| Scrapers | | | | | | | | 2 | 2 |
| Edge-Modified Flakes | 1 | | | | | | | 34 | 35 |
| Edge-Modified Chunks | | | | | | | | 2 | 2 |
| Total | 1 | | | | | | | 41 | 42 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | |
| Chunks | | | 2 | 2 | 3 | | 1 | 12 | 20 |
| Flakes | | | | | | | | 55 | 55 |
| Shatter | 1 | 5 | | | 2 | | 2 | 37 | 47 |
| Total | 1 | 5 | 2 | 2 | 5 | | 3 | 104 | 122 |
| BURNT ROCK | 1 | 2 | | | 8 | | | | 11 |
| BURNT CLAY | | | | | 4 | | | | 4 |
| UNWORKED STONE | | 5 | | | | 1 | | | 6 |
| UNWORKED BONE | | 6 | | | | | | | 6 |
| HISTORIC ARTIFACTS | | | | | | | | | |
| Glass | | 1 | 2 | | | | | 2 | 5 |
| Metal | | 10 | | | | | | | 10 |
| Ceramics | | 2 | | | | | | 21 | 23 |
| Tile | | | | | | | | 2 | 2 |
| Cinder | | 4 | | | | | | | 4 |
| Total | | 17 | 2 | | | | | 25 | 44 |
| TOTAL | 3 | 35 | 4 | 2 | 17 | 1 | 3 | 170 | 235 |

The three biface fragments include two larger fragments that may be blanks. Neither biface shows any sign of usage. The third biface is a small medial fragment. Both lateral edges exhibit attritional wear, indicating that the fragment is a small knife. All three were unheated and made from locally available gray cherts. Two marginally retouched side scrapers include one chunk and one flake that exhibit steep working edge angles suitable for scraping. Step fracture wear is present along the retouched edge of both tools. Both specimens were unheated and manufactured from local gray or brown chert.

One of the 35 edge-modified flakes was recovered from Test Unit 1. All the edge-modified flakes exhibit step fracture wear associated with light-duty scraping tasks. Both edge-modified chunks are cortical chunks. The edge-modified tools are all made from local gray or brown cherts. Only five specimens appear to have been heated.

Lithic manufacturing debris includes 20 chunks, 55 flakes and 47 pieces of shatter. Eight of the 20 chunks were recovered from test units and the rest from the surface. None were heat treated. All 55 flakes are from the surface and only two have been thermally altered. Of the 47 pieces of shatter, 37 were surface finds and ten specimens were from the plowzone of test units. Two have been heated. Except for seven pieces of debitage made from white chert, all of the manufacturing debris is locally available brown or gray chert.

The fourty-four historic artifacts include 25 from the surface, 17 from Test Unit 2 and two from Test Unit 3. These artifacts include four pieces of glass, ten metal fragments, six pieces of crockery, 18 ceramic fragments, two pieces of tile and four cinders. Glass artifacts include one cut glass handle from a bowl lid and three pieces of curved bottle glass. Metal artifacts include seven wire nails, a piece of flat sheet metal, a bottle cap and an iron ring. Crockery includes two collared rims from a mixing bowl or crock, a base fragment and a body sherd from a large dark maroon platter and two body sherds from mixing bowls or crocks. All 17 ceramic pieces are fragments of common white wear cups, saucers and plates. The ceramic tile fragments appear to be pieces of drain pipe. This material is associated with the twentieth century farmstead occupation.

Miscellaneous debris from the site consists of six unworked stones, 11 burnt rocks, four pieces of burnt clay and six pieces of unworked bone. These materials were recovered from the plowzone and surface of the site and may be associated with either or both components.

## Discussion and Recommendations

14DN328 is a multiple component unknown prehistoric and Historic period site located on a terrace above the former channel of Curtis Creek. The prehistoric component of the site has been disturbed by the historic occupation and more recent terracing of the field. Eight one by one m test units failed to recover any artifacts below the plowzone. The prehistoric component of 14DN328 appears to consist of a disturbed limited-use site of unknown cultural affiliation. The presence of

scrapers and edge-modified flakes suggests that light-duty cutting and scraping tasks occurred. Some tool manufacturing is indicated by the lithic manufacturing debris present. The historic component appears to date to the twentieth century and was severely damaged during the lake's construction. Based on the highly disturbed nature of the site, recent date and minimal content, 14DN328 is not recommended as eligible for the National Register.

## SUMMARY

During the summer of 1982, an intensive cultural resources survey and testing program was conducted on 25 percent of the land leased by the U. S. Army Corps of Engineers at Milford Lake to the Kansas Fish and Game Commission. A total of 10 sites were located and investigated to determine their eligibility for the National Register. Work was continued in the spring of 1984 with the survey and testing of an additional 637 ac of the leased lands. Four additional sites were located and evaluated in 1984 bringing the total number of sites located and investigated to fourteen. The results of the 1982-1984 investigations including the cultural affiliation, site type, significance and recommendations for the National Register are presented in Table 22. Six of the sites investigated (14CY28, 14CY29, 14CY36, 14CY50, 14CY54, 14CY301) had been reported during previous work in the Milford Lake area. The Kansas State Historical Society tested 14CY29 and 14CY301 in 1961. The remaining eight sites were first located and evaluated during the 1982 and 1984 investigations.

Of the fourteen sites investigated, six (14CY54, 14CY103, 14CY301, 14DN325, 14DN326 and 14DN327) are recommended for nomination to the National Register. 14CY54 is a mortuary complex consisting of two cairns and possibly two or three smaller earthen and rock mounds. The site is probably affiliated with the Plains Woodland Schultz phase, although the site could date to the earlier Plains Archaic or later Plains Village periods. As an example of a poorly understood ritual-mortuary complex, 14CY54 has potential to yield significant data, and consequently, is recommended to be National Register eligible. The site is not being negatively impacted by current land-use practices (pasture and grazing) and no mitigative action is recommended.

14CY103 consists of a small residential camp of unknown cultural affiliation but which may date to the ceramic periods. The site has intact deposits with organic remains present. The site is recommended to be National Register eligible based on its potential to yield significant data regarding prehistoric subsistence-settlement patterns. Recommended mitigative actions for 14CY103 include removing the site from cultivation and periodic monitoring of the cutbank which is encroaching on the site. Should significant deposits be found eroding from the cut bank stabilization or limited data recovery may be required.

The 1961 Kansas State Historical Society testing of 14CY301 found intact cultural deposits to a depth of 1.5 m (Witty 1963). The upper

Table 22. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Milford Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE | NATIONAL REGISTER RECOMMENDATION NOT ELIGIBLE |
|---|---|---|---|---|---|---|---|
| 14CY28 | T-1 Terrace | Muir | Unknown Prehistoric | Limited-Use | Site lacks subsurface integrity and content. | | + |
| 14CY29 | T-1 Terrace | Muir | Plains Woodland, Plains Archaic | Habitation | Site lacks subsurface integrity and content. | | + |
| 14CY36 | T-0 Flood-plain | Hobbs | Unknown Prehistoric | Limited-Use | Site lacks subsurface integrity and content. | | + |
| 14CY50 | T-1 Terrace | Muir | Plains Village | Limited-Use | Site lacks subsurface integrity and content. | | + |
| 14CY54 | Uplands | Kipson-Sogn | Plains Woodland | Ritual-Mortuary | Plains Woodland ritual and mortuary practices. | + | |
| 14CY103 | T-1 Terrace | Reading | Unknown Prehistoric | Camp | Plains Woodland or Plains Village subsistence settlement systems. | + | |
| 14CY301 | T-1 Terrace | Muir | Plains Woodland, Plains Archaic | Base Camp or Habitation | Plains Woodland and Plains Archaic subsistence-settlement patterns. | + | |
| 14CY304 | T-1 Terrace | Muir | Unknown Prehistoric | Limited-Use | Site lacks subsurface integrity and content. | | + |

continued

Table 22 continued. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Milford Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE | NOT ELIGIBLE |
|---|---|---|---|---|---|---|---|
| 14CY305 | T-1 Terrace | Muir | Unknown Prehistoric | Specialized Activity Area (Hide Scraping) | Site lacks subsurface integrity. | | + |
| 14CY306 | T-0 Flood-plain | Hobbs | Unknown Prehistoric | Limited-Use | Site lacks subsurface integrity and content. | | + |
| 14DN325 | T-1 Terrace | Muir | Plains Village | Base camp | Plains Village subsistence-settlement patterns. | + | |
| 14DN326 | T-1 Terrace | Muir | Plains Village | Base camp | Plains Village subsistence-settlement patterns. | + | |
| 14DN327 | T-1 Terrace | Muir | Plains Village | Base camp | Plains Village subsistence-settlement patterns. | + | |
| 14DN328 | Uplands | Irwin | Historic-Euroamerican, Unknown Prehistoric | Farmstead Limited-Use | Site area disturbed Site lacks subsurface integrity and content. | | + |

component, a Late Archaic component with possible Plains Woodland influence, extends from the surface to a depth of 76 cm (Witty 1963). A second Archaic occupation extends from a depth of 1.0 m to 1.5 m. The site was relocated in 1982 and two additional concentrations of surficial artifacts were located to the south and west of the area investigated in 1961. It was suggested that these areas are related to the upper occupation defined in Area I. At the present, it is recommended that 14CY301 be removed from agricultural production. However, erosion of Quimby Creek into Area I of the site may impact the site as the western boundary of this area extends to the creek bank. Further mitigative actions, such as stabilization or limited data recovery may be necessary in the future to protect this important site.

The other three sites, 14DN325, 14DN326, and 14DN327, which are eligible for nomination, are closely situated and, based on the data recovered during the investigations, probably contain related occupations. 14DN325 is the least disturbed of the three and has been interpreted as a Plains Village base camp. Intact cultural debris, including three features, was encountered to a depth of 80 cm. 14DN326 is situated on a topographically similar situation and intact subplow-zone cultural deposits were defined in the same stratigraphic context as at 14DN325. Radiocarbon dates from both sites indicate Plains Village period cultural affiliations. 14DN327 is the most disturbed of the three, but has the potential for containing diagnostic artifacts, and therefore may be significant in providing additional data about the interrelationship between these three sites. It is recommended that these three sites are National Register eligible and that they be withdrawn from agricultural production to protect the cultural resources from further destruction.

The remaining nine sites investigated during the study (14CY28, 14CY29, 14CY36, 14CY50, 14CY304, 14CY305, 14CY306 and 14DN328) are considered to be too disturbed or lacking sufficient content to be eligible for the National Register. Of these nine sites, only 14CY29 yielded enough cultural material to allow a tentative identification of the cultural affiliation. The Streeter site (14CY29) consists of a moderate-sized residential camp. The primary occupation at the site appears to date to the Plains Woodland period based on diagnostic artifacts recovered by Schultz and studied by the Kansas State Historical Society (Witty 1963). A possible Plains Archaic component may also be present. Extensive test excavations conducted by the Kansas State Historical Society in 1961 determined that no intact subsurface cultural deposits are present at the site. The 1984 investigations indicate that the site presently has a limited content and, as a consequence, is not recommended as eligible for the National Register. The remainder of the sites consist of light to moderate lithic scatters, which have no subsurface integrity and limited content.

# VIII. SURVEY AND TESTING AT MELVERN LAKE

Larry J. Schmits and James A. Donohue

## INTRODUCTION

Melvern Lake is located in the Osage Plains of east central Kansas (Figure 27). The Melvern Lake project was authorized by the Flood Control Act of 1954 (Public Law 83-780) and designed to control the drainage of a 349 square mile area on the upper reaches of the Marais des Cygnes River. The rolled earthfill dam was completed in 1973. The structure is 9700 ft long, 125 ft high and impounds a multipurpose pool with a surface area of 6930 ac at an elevation of 1034 ft above msl. At the maximum flood pool elevation of 1057 ft the lake extends over 13,950 ac. The shoreline of the multipurpose pool has a perimeter of 101 miles.

The initial scope-of-work for the investigations at Melvern Lake called for an intensive cultural resources survey and evaluation of the shoreline between the elevations of 1034 ft and 1042.3 ft above msl and a or 450 ac sample of the Sun Dance, Coeur d'Alene, Arrow Rock and Turkey Point Public Recreation Areas. This work was conducted from May through September of 1982. The first stage of the 1982 Melvern survey and testing program consisted of the intensive survey of a 450 ac sample of the public recreation areas above 1042.3 ft above msl. The survey of the public recreation area lands was conducted in May when high water levels had inundated the shoreline survey zone. The 450 ac surveyed were from the Turkey Point and Sun Dance Public Recreation Areas. The combined acreage of these two public recreation areas is 831 ac, or 381 ac more than the required 450 ac. However, much of this acreage is located in the shoreline survey zone and a 100 percent survey of Turkey Point and Sun Dance Public Recreation Areas assured adequate coverage of the required 450 ac.

The Turkey Point Public Recreation Area is situated on the north side of the lake, just west of the inundated channel of Turkey Creek. This area was selected for survey in 1982 since it had a large acreage of upland terrain overlooking the Marais des Cygnes River and its tributaries. The soils in this survey area are for the most part mapped as typical upland and slope series, such as Kenoma, Dennis, Clareson-Eram and Olpe-Kenoma. Land use in the public recreation area varied from lawns in picnic areas and campgrounds to thick stands of native prairie. The ground surface visibility was generally less than 25 percent. Due to the generally low surface visibility, shovel cuts were excavated every 50 m along the north to south oriented survey transects. A total of 61 transects spaced at 35 m intervals were required to inventory the Turkey Point Public Recreation Area. The survey of Turkey Point resulted in the location of no sites, other than a few flakes located near a vault toilet. The survey transect and

shovel cut intervals were reduced to 20 m in this area of the park, but no additional cultural materials were located. The flakes were recovered from an area disturbed during the landscaping and construction of recreation area. This debris did not appear to represent an intact prehistoric occupation. In any case, if a site was present at this location, the construction and terrain modifications associated with construction of the park probably have destroyed it.

The Sun Dance Public Recreation Area was also chosen as a survey unit because it provided an opportunity to investigate an area of upland terrain overlooking the Marais des Cygnes and a tributary of the Marais des Cygnes, Coal Creek. As with the Turkey Point soils, the series present here are upland soils, such as Dennis, Eram-Lula, Kenoma and Clareson-Eram. The Sun Dance Public Recreation Area is located just east of Arvonia, one of the older communities in east central Kansas. Furthermore, it was considered to be a high probability area for early Historic period sites. Land use and surface visibility were variable at the Sun Dance Public Recreation Area. Land use included maintained lawns, prairie and cultivated fields with a surface visibility of 100 percent. A total of 25 transects were required to complete the survey. Shovel cuts were excavated every 50 m along each transect where surface visibility was less than 25 percent. The survey of the Sun Dance Public Recreation Area resulted in the location of one site, a Historic Euroamerican period occupation designated as 140S123.

The second stage of the Melvern survey and testing program consisted of the intensive shoreline survey of U. S. Army Corps of Engineers lands located between 1034 and 1042.3 ft above msl. The shoreline survey was begun in mid-July when the lake waters had receeded to the 1034 ft msl elevation. The total acreage of the shoreline survey zone is approximately 2430 ac. The shoreline survey zone was divided into three major survey units designated as the North Shore Area, the West Area and the South Shore Area (Figure 27).

The North Shore Area consists of the shoreline on the north side of Melvern Lake from the dam to the section line just west of Little Cable Creek. The North Shore Area is a relatively narrow survey zone, rarely exceeding 100 m in width. Terrain in this unit consists of gentle upland slopes and higher terraces, which are mapped predominantly by the soil surveys as the Olpe-Kenoma, Clareson-Eram, Summit and Kenoma series with smaller areas of Mason, Osage and Verdigris also present. Survey transects paralleled the shoreline and along the upland divides were oriented east to west, while within the tributary valleys they were oriented northwest to southeast. Survey conditions were variable with surface visibility along the shoreline usually excellent, except where concentrations of driftwood and other debris occasionally decreased the surface visibility to 60 percent. The high lake levels in May of 1982 had actually improved surface visibility by killing and eroding vegetation. However, inland survey transects usually had surface visibility of 50 percent or less. Shovel cuts were excavated every 50 m along the transects where surface visibility was less than 25 percent. Visibility was generally less favorable along the tributary valleys due to the stands of vegetation.

A total of eight sites were located in the North Shore Area. Four of these sites (140S112, 140S113, 140S114 and 140S115) consist of light prehistoric lithic scatters. 140S113 is situated on lowland terrain while 140S112, 140S114 and 140S115 are situated on slope or upland areas. The remaining four sites, designated as 140S124, 140S125, 140S126 and 140S127, are Historic sites located on the uplands.

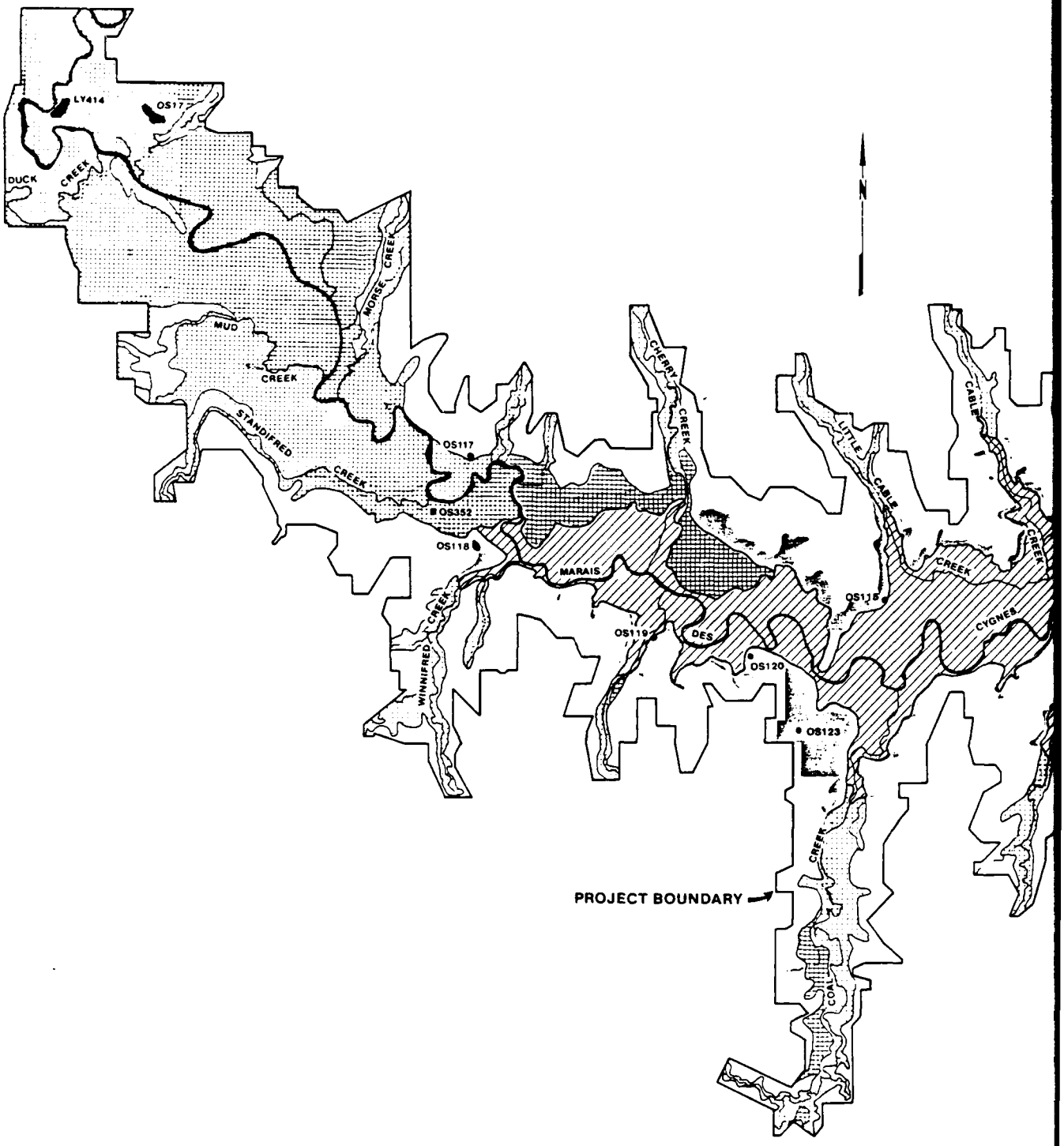
The West Area consists of the shoreline on the north and south sides of the western end of Melvern Lake. The eastern boundary of the West Area consists of a section line just west of Little Cable Creek on the north side of the lake and a section line just east of Arvonia on the south side of the lake. The terrain of the West Area, consists of broad terrace and floodplain surfaces mapped primarily as the Osage and Verdigris soil series with only small areas of slope and upland terrain present.

The West Area shoreline gradually widens near Cherry Creek from approximately 100 m to over a kilometer, as it crosses broad areas of terrace and floodplain. Surface visibility along the shoreline approached 100 percent, although much of the ground surface was covered by a recent deposit of silt. The broad, low lying terraces encountered on the outer or inland transects were covered with cockleburs and usually had a surface visibility of less than 20 percent. The poor surface visibility in these areas necessitated shovel cuts at 50 m intervals along each transect. The shovel cuts indicated that the silt deposits were up to 30 cm in depth.

Approximately 3.2 km west of Cherry Creek, the survey zone narrows and drops down to a small bench along the channel and banks of the Marais des Cygnes River and its tributaries, such as Duck Creek, Morse Creek and Mud Creek. The survey area here consisted primarily of exposed cutbanks along the stream courses and was surveyed by canoe. The canoe survey began at Duck Creek and followed the Marais des Cygnes downstream. The river has incised a deep trench into the alluvial deposits along this section of its valley, exposing numerous steep cutbanks. Each cutbank was inspected on foot for cultural materials, with particular attention paid to the confluences of the river and its tributaries. Fresh profiles were cut in areas where the cutbanks were covered with mud or silt deposits. No buried sites were found, however.

The shoreline along Standifred Creek and east to the west side of Puleston Creek crosses floodplain and terraces which are mapped largely as the Osage complex, as well as small areas of upland and slope terrain. Most of the fields situated on the broad terraces of this unit had been recently plowed, providing excellent surface visibility. Examination of the plowed fields indicated that this area had been heavily silted over. The higher terraces did not exhibit the thick silt deposites noted on the lower terraces. Except for isolated areas of heavy brush and weeds, surface visibility in this area ranged from 70 to 100 percent. In areas where less than 25 percent of the ground surface was visible, shovel cuts were excavated at 50 m intervals.

The survey zone from the east side of Puleston Creek to the west side of Winnifred Creek was narrow, rarely more than 75 m in width.


LY414
OS177
DUCK
CREEK
MUD
CREEK
MORSE
CREEK
STANDIFRED
CREEK
OS117
OS352
OS118
MARAIS
WINNIFRED
CREEK
CHERRY
CREEK
LITTLE
CABLE
CREEK
CABLE
CREEK
OS115
OS119
DES
CYGNES
OS120
OS123
COAL
CREEK
PROJECT BOUNDARY
N

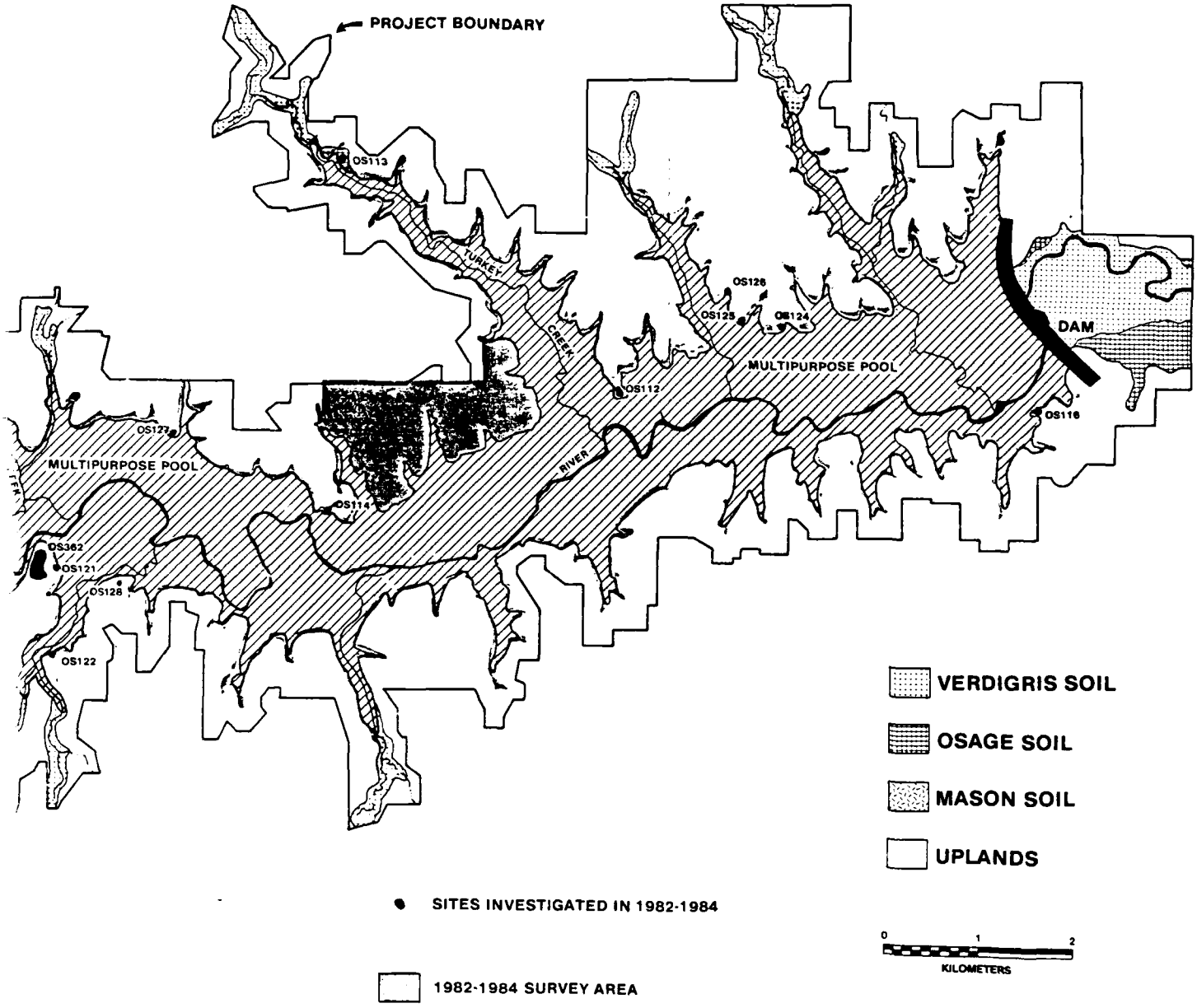



Figure 27. Location of area surveyed and sites investigated during the 1982-1984 survey at Melvern Lake.

The dominant landform in this survey tract is upland terrain, which is mapped as the Clareson-Eram, Eram-Lula and Kenoma complexes. Surface visibility ranged from 80 to 100 percent, except in the tributary valleys where the interior transects usually encountered a visibility of 30 to 40 percent. In the tributary valleys and where isolated areas of brush and woods obscured the ground surface, shovel cuts were excavated at 50 m intervals. However, most of the shoreline survey zone consisted of relatively steep and partially denuded slopes with good visibility.

The area from the east side of Winnifred Creek to the east side of Coal Creek was rarely over 100 m wide and crossed upland terrain almost entirely with Dennis and Clareson-Eram soil series mapped in here. The relatively narrow shoreline survey zone had been partially denuded of vegetation by high water. Visibility along the shoreline ranged from 80 to 100 percent, while inland transects usually had at least 30 percent visibility. Survey areas along tributaries presented more difficult survey conditions. Brush and grass were thicker in these areas and shovel cuts at 50 m intervals were generally necessary to provide adequate coverage along Winnifred and Coal creeks.

A total of six sites were located in the West Area. Five of these sites were previously unrecorded and were offically designated as 140S117, 140S118, 140S119, 140S120 and 140S123. 140S352, a site recorded by Traub in 1975, was relocated. 140S117, 140S118 and 140S123 are located on the upland slope Dennis soil. 140S119 and 140S325 are situated on terraces which are mapped as the Osage and Verdigris soil series. 140S120 is situated on upland terrain on the Clareson-Eram soil complex.

The distribution of previously recorded sites at Melvern Lake indicated that the highest frequencies of sites should have been on the terraces, the dominant landform in the West Area survey tract. The few sites in this area then, may be the result of the deposits. Layers of silts 25-30 cm in thickness are deposited in the West Area when the lake level is raised to the flood pool level. Two sites, 140S118 and 140S352, located in the West Area were protected from heavy silt deposition. One previously recorded site within the West Area, 140S351, was not relocated. This site was recorded by Traub in 1975 and reported to be located on the floodplain. This site should have been found near Standifred Creek. Survey conditions were ideal in this area and the failure to relocate this site probably results from heavy silt deposits identified in the areas of low elevation.

The South Shore Area consists of the shoreline terrain on the south side of Melvern Lake east of the section line just to the east of Arvonia. The terrain along the South Shore unit consists primarily of steep and often eroded upland slopes, which are mapped primarily as the Clareson-Eram, Summit and Kenoma series. Bedrock was often exposed in the survey zone along these slopes. The shoreline, except for small areas in the tributary valleys, was very narrow, usually less than 50 m in width. Only very small areas of lowland terraces are located in the South Shore unit and these are situated within the small tributary valleys of the creeks and intermittent streams which flow northward into the Marais des Cygnes. The survey conditions along the South Shore Area

were generally good. The high water had killed and stripped away much of the vegetation from the steep slopes. Outer or inland transects often had a surface visibility of 60 percent. Surface visibility was usually less favorable in the tributary and intermittent stream valleys and generally required shovel cuts. Survey transects were oriented roughly east to west along the intertributary sections of the shore and northeast to southwest in the intermittent and tributary stream valleys.

A total of five sites were located in the South Shore Area. These included four previously unrecorded sites (140S116, 140S121, 140S122 and 140S128) and one previously recorded site (140S362). All of the sites are situated on upland slopes except for 140S362, which is located on a blufftop. All of the sites are situated on soils mapped as the Clareson-Eram series.

Interviews with local amateur archaeologists in 1982 indicated that sites located on project lands outside the survey area in the upper reaches of Melvern Lake were being destroyed by agricultural practices, unauthorized artifact collecting and lake related flooding. The sites known to be most seriously impacted included 140S362, 14LY414 and the Hyde site (140S17). Based on the recommendations of the 1982 work (Schmits 1983), testing at these sites was conducted during the summer of 1984 under terms of the modification to contract DACW-81-C-0149.

Either or both of 140S17 and 14LY414 were believed to be the location of the Hyde site. The Hyde collection was recovered from the James Hyde farm and donated to the Kansas State Historical Society in the 1960s. Diagnostic materials in the collection range from Plains Archaic to Plains Village in cultural affiliation. The information provided by local informants, Carl Wright and Joe Hyde, indicated that there were at least three areas on the former Hyde farm from which the Hyde collection was recovered. These areas included 14LY414, 140S17 and a third area near 140S17. Due to their close proximity, 140S17 and the nearby occupational area were defined as localities of a the Hyde site with the southern component being designated as Locality I and the northern component as Locality II. The early Plains Archaic or Middle Archaic materials were determined to be located at the southern area (Locality I) of 140S17 and the Late Archaic materials at the northern area (Locality II) of 140S17. The Plains Village materials in the Hyde collection appear to have been recovered from 14LY414.

The Hyde site (140S17) and 14LY414 are located west of the West Area on project lands leased to the Kansas Fish and Game Commission. This area consists of terraces which are mapped as the Osage soil series. Little or no systematic survey of these project lands has been completed. Carl Wright has recently reported the location of several sites on these project lands in addition to 140S17 and 14LY414.

In summary, the 1982 intensive survey of the 25 percent sample of the Public Recreation Areas and the Melvern Lake shoreline survey between the elevations of 1034 and 1042.3 ft above msl resulted in the location of 17 previously unrecorded sites and two previously recorded sites. In 1984 an additional three previously recorded sites (The Hyde site (140S17), 140S362 and 14LY414) were relocated and tested to

determine their National Register status. The description of the investigations conducted at each site and recommendations for eligibility to the National Register are presented below on a site by site basis.

## 14LY414

14LY414 is situated on the lowlands of the Marais des Cygnes River (Figure 28). The site is located in a meander loop of the river which appears to be in the process of necking off. The floodplain is relatively flat in the vicinity of the site but has undulating swales. 14LY414 was originally reported by Carl Wright and is among the sites located on the former James Hyde farm. Wright has suggested that this may be the site from which part of the Hyde collection was obtained. As previously noted, the Hyde collection was donated to the Kansas State Historical Society in the early 1960s. Wright has recovered numerous arrow points and ceramics indicating the presence of a Plains Village component at 14LY414. Other materials collected from the site by Wright appear to represent Plains Woodland or earlier occupations. Wright reported that the site was severely damaged during a flood in the spring of 1982.

The initial 1984 investigations commenced with a reconnaissance of the general vicinity of the reported location of 14LY414. Joe Hyde, son of James Hyde, was interviewed and indicated the location of the site was to the west of the site recorded by Carl Wright. Surface reconaissance indicated a light lithic scatter at the location reported by Hyde. One piece of Pomona Ware ceramics was recovered. Surface visibility conditions were again generally poor and most of the surface artifacts were recovered from the field access road and from along the edges of cultivated fields.

A site datum was established and all tools or diagnostic artifacts and the maximum limits of the artifact scatter were mapped. A transect of six test units was initially excavated at 25 m intervals along the east-west baseline to a depth of 60 cm below surface or until sterile levels were reached (Figure 29). This transect is located just to the south of the field access road. Test Unit 7 was located to the north near the center of a slight rise where a light scatter of lithics was observed.

The investigations resulted in the delineation of light surficial scatter of artifacts extending over an area of approximately 29,675 sq m. Cultural materials were recovered in Test Units 1, 3 and 4. A thick cultural deposit consisting of charcoal, burnt clay, animal bone, burnt rock, chipped stone tools and debitage was encountered in Test Units 3 and 4. The highest artifact densities were located from 30 to 60 cm below surface in Test Unit 3 and from 50 to 80 cm below surface in Test Unit 4. A rock hearth (Feature 1) consisting of burnt sandstone, burnt clay, charcoal and associated bone and chipped stone tools was

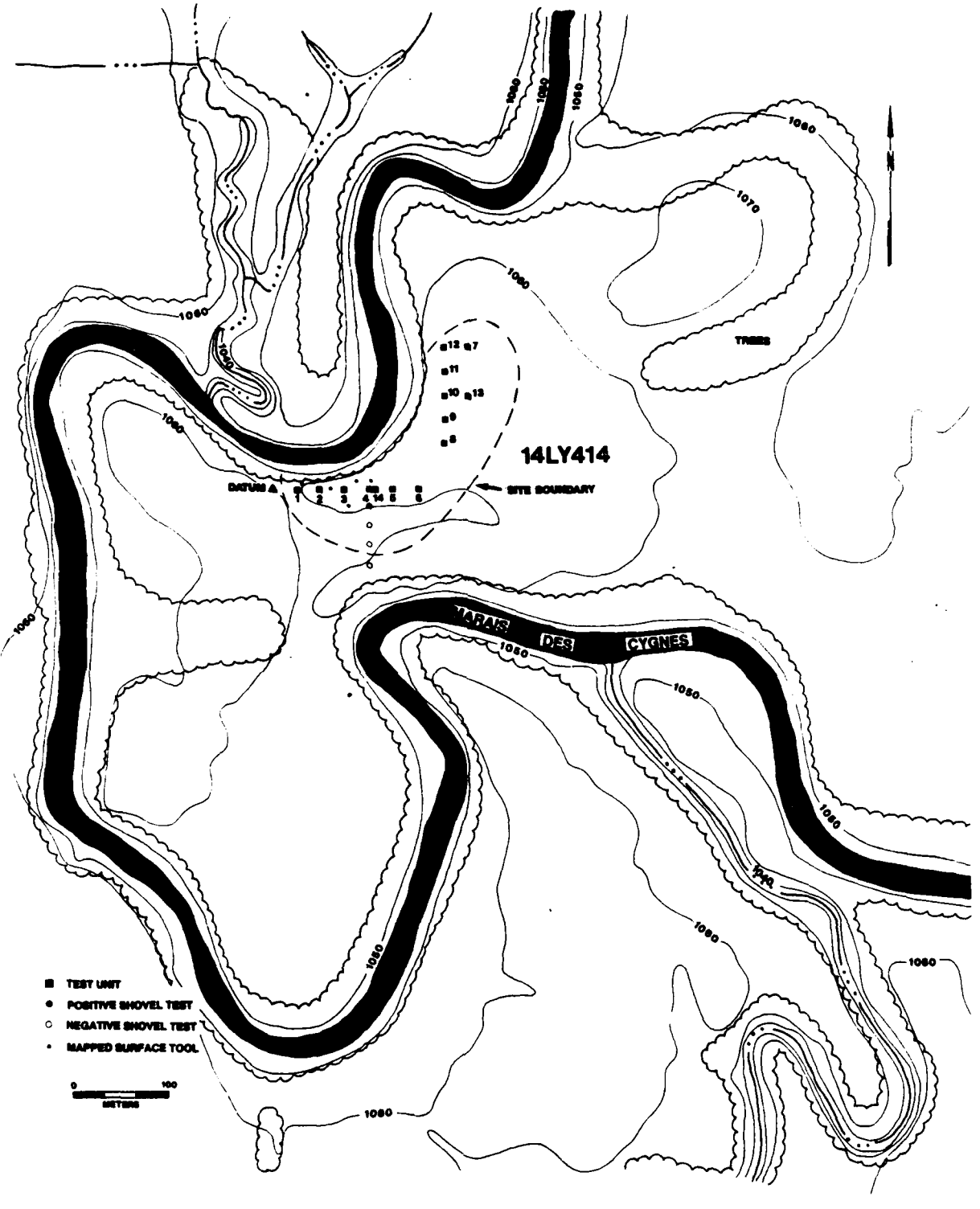



Figure 28. Location of test excavations at 14LY414.

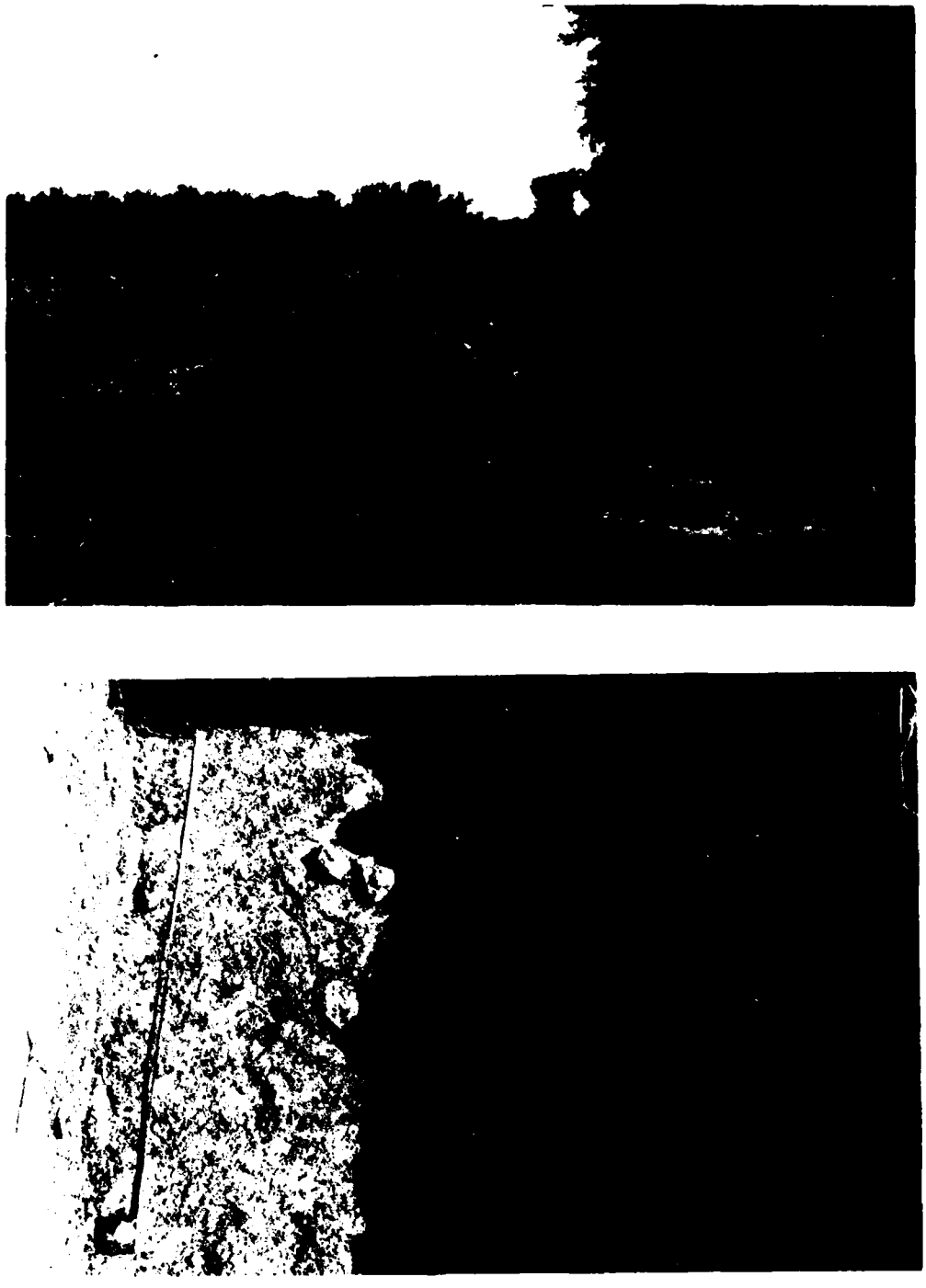


Figure 29. Test excavations in progress and features at 14LY414. General view of excavations (upper). Feature 1 (lower).

encountered in Test Unit 4 between 60 and 80 cm below surface (Figure 29). The depth of the buried cultural deposit complicated the process of site delineation and an auger was used to determine the extent of the dense cultural mix noted during the test excavations. A transect consisting of three soil core tests was excavated at 25 m intervals south of Test Unit 4. All three tests proved to be sterile. Two additional auger tests were excavated ten meters and ten meters south of Test Unit 4. Both soil cores exhibited burnt earth, bone and charcoal flecks at a depth of 60 cm below surface. These initial data indicated that the buried deposit extends over an area of at least 30 by 30 m and was probably somewhat larger.

Further consultation with Carl Wright in the fall of 1984 also indicated that the area of the site where he recovered the majority of the Plains Village materials was in fact located north of Test Unit 6. This area of the site is bisected by a shallow swale. The site was visited again in October of 1984. Examination of the slopes of the swale revealed a light scatter of cultural material in an east-west gully. A transect of north-south test units (Test Units 8-12) were placed at 25 m intervals to determine if intact deposits were present in this area of the site (Figure 28). A sixth unit (Test Unit 13) was placed 25 m east of this transect at the crest of the low rise from which the cultural material appeared to be eroding. Test Unit 14 was also excavated immediately adjacent to Test Unit 4 in an attempt to recover additional diagnostic artifacts from the lower component. These units were excavated to a depth of 40-80 cm below surface or until sterile deposits were reached.

The additional investigations indicated that a light surficial scatter of artifacts covering an area of approximately 300 by 120 m was also present. Surface material was most concentrated in the vicinity of Test Unit 10. Cultural material was recovered from all of the test units, although minimal material was recovered from most of them. Artifacts were recovered from the upper 30 cm in Test Units 8, 11, 12 and 13 and appear to be primarily associated with the upper Plains Village component. Deeper materials were encountered in Test Units 10 and 14 and appear to be associated with the lower component. A concentration of bone located at a depth of 50 cm in Test Unit 10 appears to be associated with the lower component and indicates that this component extends further to the north than originally thought.

## Soil Stratigraphy

The geomorphic setting of 14LY414 is on the lowlands of the Marais des Cygnes River. The site is subject to frequent flooding due to its position on a low narrow meander loop of the river. The soil at the site is characterized by a silty loam Ap horizon overlying a truncated IIB21g horizon. The boundary between the Ap and IIB21g horizons is very abrupt. The IIB horizons are very firm silty clays with colors ranging from very dark gray to dark brown.

The clay-rich sediments of the subsoil at 14LY414 represent an overbank alluvial deposit. It is likely that the original A horizon of

the soil was stripped off by floodwaters and silty sediments were subsequently deposited on the truncated B horizon. Cultural materials occur in the Ap horizon and in the IIB22t and IIB3 horizons. The soil profile description for Test Unit 4, which is representative of the stratigraphy observed in the other five test units is presented below. Only minor variations in the depths of the soil horizons occurred in the other test units.

Test Unit 4:

| | | |
|---|---|---|
| Ap | 0-20 cm | Dark grayish brown (10YR4/2) silt loam; weak fine granular structure; hard, firm common fine roots; smooth abrupt boundary. |
| IIB21g | 20-29 cm | Very dark grayish brown (10YR3/2) silty clay; few distinct brown (10YR4/3) mottles; weak coarse blocky structure; very hard, very firm; common pores; light cultural scatter in lower 5 cm; diffuse smooth boundary. |
| IIB22t | 29-64 cm | Very dark gray (10YR3/1) silty clay, common fine brown (10YR3/3) mottles; weak coarse blocky structure; very hard, very firm; common slickensides on ped surfaces; dense cultural midden in lower 5 cm; diffuse smooth boundary. |
| IIB33 | 64-98+ cm | Very dark grayish brown (10YR3/2) silty clay, common fine brown (10YR3/3) mottles; weak coarse blocky structure; very hard, very firm, few thin discontinuous slickensides; dense cultural debris in upper 20 cm. |

The Ap horizon thins to the north and in Test Units 8-13 is only 5-12 cm in thickness.

## Cultural Feature

Feature 1 consists of a rock hearth 80 cm in length and 110 m in width. The feature fill consisted of a concentration of burnt tabular sandstone and limestone cobbles associated with burnt clay, charcoal, animal bone, chipped stone tools and debitage. A total of 54 burnt sandstone cobbles, three projectile points, a bifacial knife and a

scraper were recovered from the feature. The feature is situated between 60 and 80 cm below surface in Test Units 4 and 14. Most of the burnt rock, charcoal and chipped stone tools were recovered from the 60 to 70 cm level. A dense concentration of yellowish orange burnt clay continued to a depth of 80 cm. The thickness of the feature indicates that the hearth was probably utilized over some period of time. Wood charcoal for radiocarbon dating was collected from the hearth. The feature matrix was retained for flotation.

## Radiocarbon Date

The charcoal sample from Feature 1 was submitted to Beta Analytic, Inc. for radiocarbon dating. The result of the assay (Beta 10332) is 2390±110 years B.P. indicating a late Late Archaic or transitional Late Archaic/Plains Woodland temporal position for the lower component at 14LY414.

## Artifact Assemblage

A total of 356 artifacts were recovered from 14LY414. This material includes four ceramic sherds, 24 chipped stone tools, 105 pieces of lithic manufacturing debris, three minerals, 76 pieces of unworked bone, 74 burnt rocks, 12 pieces of daub and 56 unworked stone (Table 23). The ceramics include two small body sherds recovered from the surface and one rim sherd and one body sherd recovered from Test Unit 13. The body sherds are small cordmarked specimens tempered with indurated clay or grog (Figure 30a). The rimsherd is cordmarked on the exterior, smoothed on the interior and was tempered with indurated clay or grog (Figure 30b). The sherds appear to be sections of Pomona Ware vessels.

The 24 chipped stone tools include four projectile points, two bifacial knives, five blanks, six biface fragments, four scrapers and three edge-modified flakes. Seven of the chipped stone tools appear to have been heat treated. Three of the projectile points were associated with Feature 1. The first specimen is a small corner-notched dart point with a triangular blade and slightly convex base (Figure 30c). It has a lateral fracture. The second specimen consists of the proximal section of a slightly expanding stemmed point with a convex base (Figure 30d). Both specimens were manufactured from gray fossiliferous chert. The third point is a complete corner-notched specimen (Figure 30E). This point was made from a triangular preform with a lenticular cross-section. The point is made from heated local chert and has been resharpened along one lateral margin. The cultural affiliation of these three points is not certain, although they could be affiliated with either the Plains Archaic or Plains Woodland periods. The fourth point was located in the plowzone of Test Unit 12. This specimen lacks the base and was a long, narrow blade with a biconvex cross-section. It was manufactured from an olive-gray quartzite (Figure 30f). Two bifacial knives were found, one in association with Feature 1 and one from the surface. The first is an ovate knife recovered from Feature 1 (Figure 30g). It is manufactured from a black nonlocal fossiliferous chert.

Table 23. Artifact assemblage from 14LY414.

| | Test Units | | | | | | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 3 | 4 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | |
| CERAMICS | | | | | | | | | | | | |
| Rim Sherd | | | | | | | | | 1 | | | 1 |
| Body Sherds | | | | | | | | | 1 | | 2 | 3 |
| Total | | | | | | | | | 2 | | 2 | 4 |
| CHIPPED STONE TOOLS | | | | | | | | | | | | |
| Projectile Points | | | 2 | | | | | 1 | | 1 | | 4 |
| Bifacial Knives | | | 1 | | | | | | | | 1 | 2 |
| Bifacial Blanks | | 1 | 1 | | | | | | | | 3 | 5 |
| Biface Fragments | | | 2 | | | | | | | | 4 | 6 |
| Scrapers | | | 1 | | | | | | | | 3 | 4 |
| Edge-Modified Flakes | | | 2 | | | | | | 1 | | | 3 |
| Total | | 1 | 9 | | | | | 1 | 1 | 1 | 11 | 24 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | | | |
| Cores | | 2 | | | | | | | | | 1 | 3 |
| Chunks | | 1 | 2 | | | | | 1 | | 1 | 1 | 6 |
| Flakes | | 6 | 31 | | | | 1 | 2 | 33 | 8 | | 81 |
| Shatter | 1 | 3 | 8 | | | | | | 2 | 1 | | 15 |

Continued

Table 23 continued. Artifact assemblage from 14LY414.

| | Test Units | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 3 | 4 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Surface | TOTAL |
| Total | 1 | 12 | 41 | | | | 1 | 3 | 35 | 10 | 2 | 105 |
| HEMATITE | | 1 | 1 | | 1 | | | | | | | 3 |
| BONE | | 1 | 57 | 2 | | 5 | | | 4 | 7 | | 76 |
| BURNT ROCK | | 19 | 51 | | | | | | | 4 | | 74 |
| DAUB | | | 3 | | | | | | | | 9 | 12 |
| UNWORKED STONE | | 3 | 23 | | 2 | | | 4 | 2 | 22 | | 56 |
| HISTORIC | | | | | | 1 | | | 1 | | | 2 |
| TOTAL | 1 | 37 | 185 | 2 | 3 | 6 | 1 | 8 | 45 | 44 | 24 | 356 |

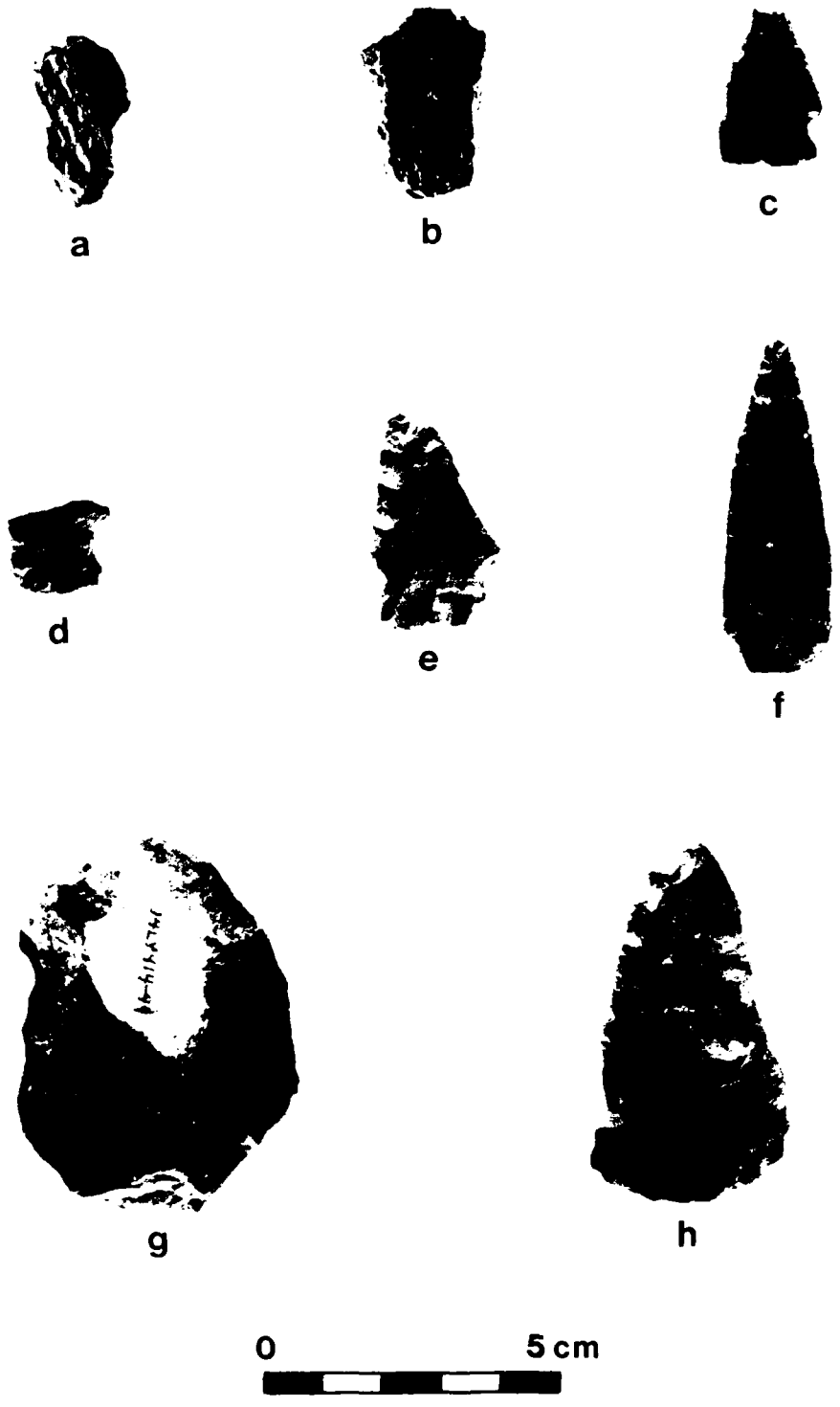



Figure 30. Artifacts recovered from 14LY414: a, body sherd; b-c, projectile points; d-e, bifacial knives.

The second specimen is a thin well-made subtriangular knife manufactured from brown fossiliferous chert (Figure 30h). Bifacial blanks include four small unthinned specimens derived from locally available chert pebbles and one well made subrectangular preform. The preform has a transverse fracture and is made from a banded pinkish gray fossiliferous chert. The six biface fragments are small pieces of light-duty bifaces. Scrapers include one unifacial circular scraper from Feature 1, one unifacial scraper fashioned from a chert pebble and two marginally retouched flake scrapers made from brown or gray fossiliferous chert. The edge-modified debitage consists of two modified flakes from Test Unit 4 and one modified flake from Test Unit 13.

Lithic manufacturing debris recovered from 14LY414 consists of three cores, six chunks, 81 flakes and 15 pieces of shatter. With the exception of one core and one chunk all of the manufacturing debris was recovered from the test units. The majority of the flakes are secondary or tertiary elements although a number of bifacial flakes were also recovered. Overall, the latter stages of lithic reduction appear to have predominated at the site. A total of 74 pieces of burnt rock and 56 pieces of unworked stone were also recovered. Most of this material is hearthstones from Feature 1.

The remainder of the artifact assemblage includes three pieces of hematite, 76 pieces of unworked animal bone, 12 pieces of daub and two historic artifacts. Nearly all of the bone was recovered from the fill of Feature 1 within the lower component. In contrast, most of the daub was located on the surface and may indicate the presence of a former structure associated with the upper component. The historic artifacts include one metal bolt and one piece of glass recovered from the cultivation zone.

## Discussion and Recommendations

14LY414 consists of a large, multicomponent site. Based on the rim and body sherds recovered, and on information provided by Carl Wright, the upper component found in the Ap and IIB21g soil horizons is a Plains Village Pomona focus component. No middens, features or dense artifact concentrations were located in association with the upper component in the areas tested. The upper component covers an area of some 36,000 sq m and has been scoured at various times by flooding from the Marais des Cygnes River. This process has removed most of the A horizon in which the Pomona focus materials are located, and consequently, most of the upper occupation has been destroyed. This component could still retain some integrity such as truncated features, although none were found.

The second component at 14LY414 was encountered in Test Units 4, 10 and 14 and is primarily located in the IIB3 soil horizon at a depth from 60 to 80 cm below surface. This component covers an area of at least 900 sq m in the vicinity of Test Unit 4 based on the results of the test excavations and soil coring. The lower component is also present in the northeastern portion of the site where a layer of bone was encountered at 50 cm below surface in Test Unit 10. Features and a dense cultural

mix of burnt earth, burnt rock, bone and debitage are associated with the lower component. Based on the depth of the deposit, soil stratigraphy and three dart points, this component is believed to be a Plains Archaic or transitional Plains Archaic/Plains Woodland occupation. The results of the radiocarbon date of 2390±110 years B.P. from Feature 1 supports this interpretation. The date of 2390±110 years B.P. is comparable to dates from Late Archaic Walnut phase components at the Snyder site in the El Dorado Lake areas (Grosser 1977) and at the Coffey site in the Tuttle Creek Lake area of northeastern Kansas (Schmits 1981). The triangular corner-notched points from the lower component are also comparable to some of the smaller, less deeply corner-notched forms from the Walnut phase component at Snyder.

The dense cultural midden and associated features indicate that the lower component represents an intensive occupation such as a residential camp or base camp. The presence of a hearth and a dense cultural midden suggests that the debris may even represent a habitational structure. The preservation of bone and other organics associated with this occupation enhances the potential of this component to provide much needed data on Walnut phase settlement-subsistence practices. Based on these considerations, 14LY414 is recommended to be eligible for the National Register. The site is highly threatened by the encroachment of the meander of the Marais des Cygnes and by lake related flooding. It is recommended that the river bank be stabilized with rip-rap to prevent the meander from eroding into the site. If this is not feasible or cost effective, data recovery investigations should be concluded at 14LY414. Ideally, this work should consist of hand excavated block excavations and mechanical excavations of sufficient scope to adequately sample the significant deposits at the site.

## HYDE SITE (140S17)

The Hyde site is located on the lowlands of the Marais des Cygnes just northeast of its confluence with Duck Creek (Figure 31). The site is on a low terrace with an intermittent tributary of the Marais des Cygnes located to the east and a draw or gully extending along the western and southern boundaries of the site. The site was initially reported by John Eoff of the University of Kansas who observed some burnt rock and flint chips. The site has been investigated by Carl Wright of Osage City, Kansas who has collected a number of side-notched dart points and identified the site as an early Plains Archaic site (Wright 1982). The site was briefly visited by ESA personnel with Wright in 1982. Wright indicated that a second site was located immediately to the northwest of the original locality and that he had collected Late Archaic materials from this area similar to those from the Munkers Creek/Black Vermillion phase sites. This occupational area has been defined as Locality II of 140S17 while the original site area has been designated as Locality I. The site was recommended for testing in the 1983 draft report (Schmits et al. 1983).

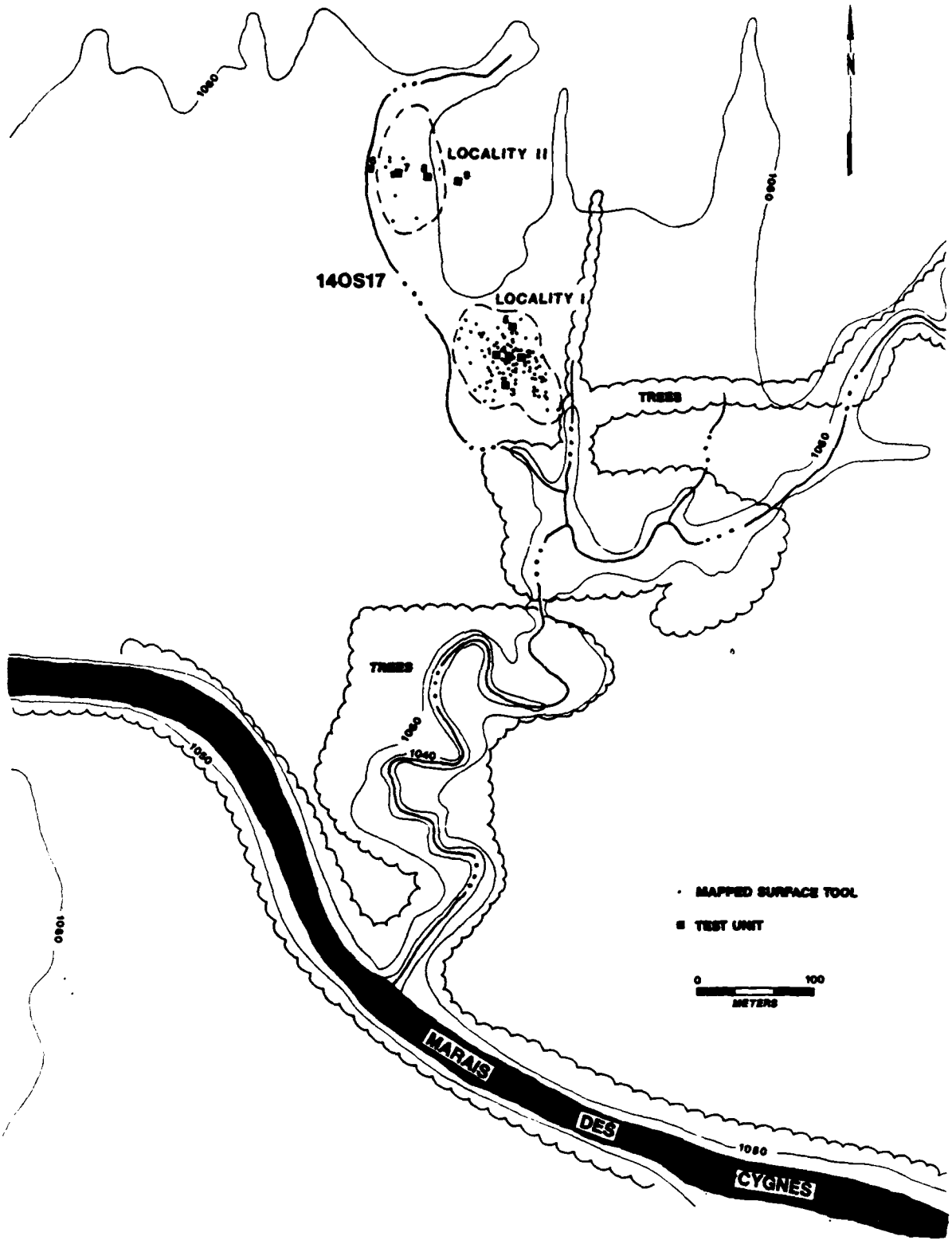



Figure 31. Location of test investigations at 140S17.

The 1984 investigations included the establishment of a site datum, mapping of all surface tools and the excavation of five test units at Locality I and four test units at Locality II. The results of this work indicated the presence of an 80 by 150 m lithic scatter at Locality I and a light lithic scatter at Locality II. Surface visibility was excellent since the field had just been cultivated. The surface collection indicated the presence of a moderately dense lithic scatter extending over 6600 sq m at Locality I and a light lithic scatter extending over 4824 sq m at Locality II. Test units were taken to a depth of 60 cm below the surface. Cultural material was recovered from Test Units 1, 2, 4 and 5 at Locality I. A light scatter of debitage was encountered to a depth of 50 cm in Test Unit 1. Test Unit 2 produced a dense scatter of debris extending to a depth of 40 cm, but primarily concentrated in the upper 20 cm or cultivation zone. A light scatter of debitage was present to a depth of 30 cm in Test Units 4 and 5. At Locality II Test Unit 6 was sterile and appears to be deflated by the gully. A moderate scatter of debris was recovered from the upper 50 cm of Test Unit 7. A single flake was recovered from Test Unit 8 and Test Unit 9 proved to be sterile. A total of 1065 artifacts were recovered from the Hyde site. Of this number, 724 (67 percent) were recovered from Locality I and 281 (26 percent) from Locality II. At both localities the majority of the assemblage was recovered from the surface as only 61 artifacts were recovered from the test units at Locality I and 139 from the test units at Locality II.

## Soil Stratigraphy

The Hyde site is located on a low terrace of the Marais des Cygnes River. The soils formed in the sediments at the site resemble the Osage series. Typically, the Ap horizon of these soils is brown silt loam about 16 cm thick. The Ap horizon has a very abrupt boundary with the underlying IIB21g horizon. The very dark gray argillic B horizon is a firm silty clay about 80 cm thick. It has been truncated down to and within the IIB22g horizon in some locations. The high clay content of the IIB horizons suggests that the terrace sediments at 140S17 represent an overbank alluvial deposit. It appears that the original A horizon of the terrace soil was stripped off by erosion and that silty overbank sediments were deposited on the surface of the truncated IIB horizon. A representative soil profile description from 140S17 is presented below:

| | | |
|---|---|---|
| Ap | 0–16 cm | Very dark grayish brown (10YR3/2) silt loam; moderate fine granular structure; slightly hard, friable; common fine roots; abrupt smooth boundary. |



Figure 32. General view of test excavations and feature at 140S17. Excavations at Locality I in progress (upper) and Feature 1 (lower).

| | | |
|---|---|---|
| IIB21g | 16-34 cm | Very dark gray (10YR3/1) silty clay; few fine dark brown (10YR3/3) mottles; weak and moderate medium blocky structure; very hard, very firm; common slickensides on ped faces; gradual smooth boundary. |
| IIB22g | 34-60+ cm | Very dark gray (10YR3/1) silty clay; few fine dark brown (10YR3/3) mottles; weak and moderate medium and coarse blocky structure; very hard, very firm; common slickensides on ped faces. |

## Cultural Features

The most concentrated subsurface deposits were found in Test Unit 2 at Locality I where two small clusters of burnt sandstone were encountered. The upper cluster, Feature 1, consisted of a linear scatter of sandstone cobbles 20 cm by 70 cm and a smaller cluster 15 by 20 cm. These two clusters were approximately 60 cm apart and were encountered at a depth of 26 cm, just below the cultivation zone (Figure 32). Four modified flakes and two cores were associated with this feature.

The second cluster, Feature 2, was encountered at a depth of 37-43 cm below the surface in Test Unit 2 and consisted of a crescent shaped cluster of sandstone cobbles with a maximum length of 70 cm (Figure 32). No charcoal or burnt clay was associated with either Feature 1 or 2 although the sandstone cobbles were clearly thermally oxidized. The two features appear to represent deflated hearths.

## Thermoluminescence Date

A sample of burnt sandstone from Feature 2 was submitted to Alpha Analytic, Inc. for thermoluminesence dating. A date of 6370 years B.P. (±18 percent) was obtained. The results of this data confirm the early Plains Archaic or Middle Archaic cultural affiliation for Locality I of the Hyde site.

## Artifact Assemblage

The artifact assemblage from 140S17 is presented in Table 24. A total of 285 chipped stone tools, 731 pieces of lithic manufacturing debris, 11 ground stone tools and 43 pieces of miscellaneous unworked stone, unworked bone and hematite were recovered.

The chipped stone tool assemblage from Locality I includes 15 projectile points, three bifacial knives, 13 bifacial blanks and

Table 24. Artifact assemblage from 140S17.

| | LOCALITY I | | LOCALITY II | | TOTAL | | SITE |
|---|---|---|---|---|---|---|---|
| | Surface | Test Units | Surface | Test Units | Surface | Test Units | TOTAL |
| **Chipped Stone Tools** | | | | | | | |
| Projectile Points | 15 | | 2 | | 17 | | 17 |
| Bifacial Knives | 3 | | | | 3 | | 3 |
| Bifacial Blanks and Preforms | 13 | | 3 | | 16 | | 16 |
| Chipped Stone Axe | 1 | | | | 1 | | 1 |
| Bifacial Scrapers | 12 | | | | 12 | | 12 |
| Biface Fragments | 29 | | 15 | | 44 | | 44 |
| Unifacial Scrapers | 16 | 2 | 1 | | 17 | 2 | 19 |
| Perforators | 4 | | 1 | | 5 | | 5 |
| Flake Knife | 2 | | | | 2 | | 2 |
| Notches | 4 | | 1 | | 5 | | 5 |
| Modified Flakes | 90 | 8 | 39 | 5 | 129 | 13 | 142 |
| Modified Chunks | 14 | | 4 | 1 | 18 | 1 | 19 |
| Total | 203 | 10 | 66 | 6 | 269 | 16 | 285 |
| **Lithic Manufacturing Debris** | | | | | | | |
| Cores | 48 | 4 | 19 | 3 | 67 | 7 | 74 |
| Flakes | 132 | 5 | 50 | 5 | 182 | 10 | 192 |
| Chips | 125 | 3 | 60 | 19 | 185 | 22 | 207 |
| Chunks | 34 | 5 | 13 | | 47 | 5 | 52 |
| Shatter | 105 | 14 | 60 | 27 | 165 | 41 | 206 |
| Total | 444 | 31 | 202 | 54 | 646 | 85 | 731 |

continued

Table 24 continued. Artifact assemblage from 140S17.

| | LOCALITY I | | LOCALITY II | | TOTAL | | SITE |
|---|---|---|---|---|---|---|---|
| | Surface | Test Units | Surface | Test Units | Surface | Test Units | TOTAL |
| Ground Stone Tools | | | | | | | |
| Mano | | 1 | | | | 1 | 1 |
| Abraders | 1 | 1 | | | 1 | 1 | 2 |
| Hammerstones | 3 | | 2 | | 5 | | 5 |
| Ground Stone Fragments | 2 | | 1 | | 3 | | 3 |
| Total | 6 | 2 | 3 | | 9 | 2 | 11 |
| UNWORKED STONE | 8 | 12 | 3 | 16 | 11 | 28 | 39 |
| UNWORKED BONE | 1 | 1 | | 1 | 1 | 2 | 3 |
| HEMATITE | | | | 1 | | 1 | 1 |
| TOTAL | 662 | 56 | 274 | 78 | 936 | 134 | 1070 |

preforms, one chipped stone axe, 12 bifacial scrapers, 29 biface fragments, 18 unifacial scrapers, four perforators, two flake knives, four notches and 112 edge-modified flakes and chunks. The 15 projectile points consist of a fairly homogeneous assemblage of 13 small side-notched (Figure 33a-h) and two lanceolate (Figure 33j-k) bifaces. One large expanding stemmed form is also present (Figure 33i). The predominant side-notched form is a small subtriangular dart point with a slightly concave base. These points are almost always characterized by basal grinding and often by ground notches. Complete or nearly complete points range from 21-34 cm in length, 15-19 mm in width and 4-7 mm in thickness. The side notches are small, ranging from 5-7 mm in width and 1-2 mm in depth. Stem width ranges from 11-15 mm. Judging from luster and color, five of the 13 side-notched points have been heated. Two side-notched points are made from nonlocal white chert similar to Burlington chert from Missouri. One is of a fossiliferous olive chert and the others are local gray and tan cherts. The two lanceolate points are bases of what appear to be small lanceolate points with straight bases and lenticular cross-sections. Both are made from local heated chert.

The bifacial knives from Locality I include one proximal fragment of a medium sized subtriangular knife (Figure 34a), a small ovate knife and a nearly complete large ovate knife (Figure 34b). The chipped stone axe is a notched heavy-duty biface (Figure 34c). The bifacial scrapers include four stemmed forms, two of which are almost certainly made from projectile point fragments (Figure 33m-p). The other two are made from small side-notched bifaces. Other bifacial scrapers include six made from bifacial blanks (Figure 34d) or blank fragments and two which would be unifacial plano-convex end scrapers except for bifacial thinning on the ventral flake surface (Figure 34f). The blanks and preforms include 10 unthinned blanks (Figure 34e), many of which are fragmentary, and three smaller thinned projectile points preforms. The bifaces from Locality I are made of local unheated chert although two bifacial scrapers appear to be made from nonlocal white cherts similar to Burlington chert. One bifacial knife, three bifacial scrapers, two preforms and one blank appear to be heated.

Unifacial and marginally retouched tools from Locality I include 18 scrapers, four perforators, four notches and two flake knives. The scrapers include five unifaces and 13 marginally retouched tools. The majority of these have a markedly convex edge and appear to be hideworking tools. The perforators include three triangular shaped tools and one irregular shaped marginally retouched tool. The notches are large with a concave margin of retouch about 25 mm in length which would have been suitable for use as spokeshaves (Figure 34h-i). The two flake knives are large marginally retouched flakes. Edge-modified tools include 98 flakes and 14 chunks. The unifacial, marginally retouched and edge-modified tools are almost entirely made of local unheated chert, although one marginally retouched scraper and one notch are made from nonlocal white chert. Three marginally retouched scrapers and a small percentage of the edge-modified tools have been heated.

Chipped stone tools from Locality II include two projectile points, three bifacial blanks and preforms, 15 biface fragments, one unifacial

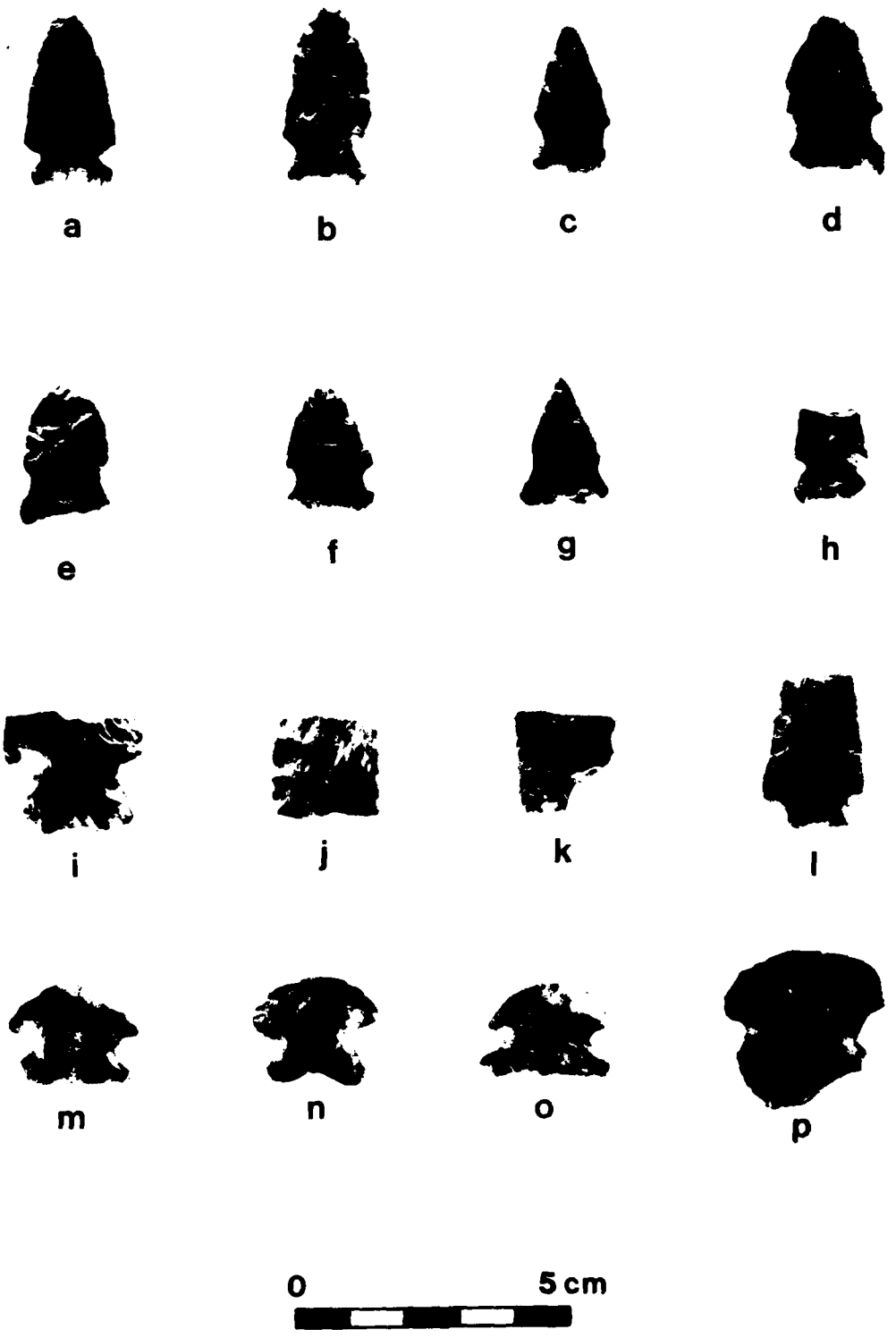



Figure 33. Projectile points and stemmed bifacial scrapers from 140S17: a-h, side-notched points from Locality I; i, expanding stemmed point from Locality I; j-k, lanceolate points from Locality I; l, corner-notched point from Locality II; m-p, stemmed bifacial scrapers from Locality I.




Figure 34. Chipped stone tools from Locality I of 140S17: a-b, bifacial knives; c, chipped stone axe; d, bifacial scraper; e, bifacial blank; f-g, unifacial scrapers; h-i, perforators.

scraper, one perforator, one notch, 39 edge-modified flakes and four edge-modified chunks. The points include one medium-sized triangular corner-notched point with a concave base (Figure 331). The second point is a base of stemmed or shallow side-notched point. The three biface blanks include two thick unthinned specimens and a fragment of a thinned biface. Fifteen biface fragments were also recovered. Unifacial and edge-modified tools include one unifacial scraper, one perforator, one notch and 43 edge-modified flakes and chunks. All of the chipped stone tools from Locality II appear to be unheated local cherts.

The lithic manufacturing debris from Locality I at 140S17 includes 52 cores, 137 flakes, 128 chips, 39 chunks and 119 pieces of shatter and 22 cores, 55 flakes, 79 chips, 13 chunks and 87 pieces of shatter from Locality II. The majority of this material appears to be local chert cobbles derived from river gravels. A small percentage of the material is quartzite, greenstone and nonlocal chert. The majority of the debitage is unheated, although a small percentage from both localities is heated. Primary and secondary decortication flakes as well as bifacial thinning flakes are represented.

Ground stone tools from Locality I include a well-shaped pecked and ground quartzite mano, two sandstone abraders, three chert cobble hammerstones and two ground stone fragments. The ground stone assemblage from Locality II includes two chert hammerstones and one ground stone fragment.

Other debris include 20 pieces of unworked stone and two pieces of unworked bone from Locality I and 19 pieces of unworked stone, one unworked bone and one piece of hematite from Locality II. The unworked stone consists primarily of heated sandstone which appear to be fragments of hearthstones.

## Discussion and Recommendations

The Hyde site is located on the T-1 terrace of the Marais des Cygnes River and consists of two horizontally separated lithic scatters designated as Localities I and II. Locality I is the larger of the two and contains a moderately dense scatter of surficial debris concentrated in the upper 30-40 cm of the soil profile and extending to a depth of 50 cm. The presence of debris below the cultivation zone, including two small burnt rock features from Test Unit 2, indicates that intact cultural deposits are present. Test excavations at Locality II indicate that a light scatter of debris is present to a maximum depth of 50 cm. While intact deposits are present at both localities, they have been damaged somewhat by scouring due to flooding and by cultivation.

The projectile point assemblage from Locality I consists of 13 small side-notched and two small lanceolate dart points. Other distinctive artifacts include side-notched bifacial scrapers made from reworked projectile points. These tools are remarkably similar to a number of early Plains Archaic assemblages from the eastern Prairie Plains border, especially the Logan Creek site in eastern Nebraska (Kivett 1962), the Cherokee Sewer site in northwestern Iowa (Anderson

1980) and the assemblage recently recovered from 23JA143 in the Blue Springs Lake area of western Missouri (Schmits: unpublished data). The similarities appear to be the closest with 23JA143, which has been dated at 6660±100 years B.P. The assemblage from 23JA143 is also similar to Horizon I at the Cherokee Sewer site, which is dated at 5950±82 to 6380±90 years B.P. (Anderson 1980). Both contain narrower and larger varities of the small side-notched points.

Horizon II at Cherokee Sewer and the Logan Creek site contain broader and shorter side-notched forms. Horizon II at Cherokee Sewer has been dated at 7370±100 and 7480±100 years B.P. Dates from Logan Creek range from 8025±250 to 6065±300 years B.P. An estimated age of approximately 6000-7000 years B.P. for 140S17 then seems likely. The result of the thermoluminescence date of 6370±18 percent appears then to be a reasonable estimate of the age of Locality I of the Hyde site.

Two other sites in the upper Marais des Cygnes River basin have side-notched points similar to those recovered from the Hyde site. Carl Wright has recovered several points from 140S102, which is located east of Melvern Lake. The other site, 140S102, is located at Pomona Lake. These three early Plains Archaic sites have been investigated only on a limited basis, however it appears that the three sites represent a single cultural unit based on the similarities in point styles. Further investigations will likely permit the delineation of an early Plains Archaic Hyde phase.

The assemblage from Locality I of 140S17 indicates that hunting and butchering (projectile points, bifacial knives, flake knives), chipped stone tool manufacture (blanks, cores, debitage, hammerstones), and hideworking (scrapers, perforators) were the dominant activities that took place at the site. The edge-modified tools indicate tasks requiring light-duty cutting and scraping tools were also important. Woodworking is minimally indicated by the chipped stone axe, notches and possibly by the abraders. Plant food preparation likewise is only minimally indicated by the single mano. Overall, the size of the site and nature of the assemblage indicate that the site appears to be a residential camp occupied for a brief interval rather than a special purpose locale or a more intensively occupied base camp. The cooking features further attest to the occurrence of domestic tasks.

The data recovered from Locality II of 140S17 is much more restricted. The corner-notched points likely date to the Late Archaic period, although specific placement does not appear possible. As noted above, Carl Wright has reported finding artifacts from this area of the site that are similar to those recovered from Late Archaic Black Vermillion/Munkers Creek phase sites. The corner-notched points do not appear to be related to these phases, although the base of the stemmed or shallow side-notched point is similar to some of the points recovered from Black Vermillion phase levels at the Coffey site (Schmits 1981). The expanding stemmed point from Locality I is also similar to points from Black Vermillion phase points at Coffey and may well be associated with the Late Archaic Locality II occupation rather than the earlier Archaic occupation at Locality I. In summary, the Locality II

occupation at the Hyde Site appears to date to the Late Archaic period, although a firm relationship to either the Black Vermillion or Munkers Creek phases has not been established. Activities which appear to have taken place at Locality II include hunting and butchering and chipped stone tool manufacture. The size and intensity of the occupation appear to be restricted relative to the Locality I occupation, although the Locality II occupation may also have served as a briefly occupied residential camp.

The Hyde site is one of the few known early Plains Archaic sites in Kansas. The site contains intact deposits and clearly has the potential to make a significant contribution toward understanding the cultural history, settlement-subsistence patterns and lithic technology of early Plains Archaic populations. It is therefore recommended as eligible for the National Register. Since the site is a National Register eligible property, and since it is being adversely impacted by cultivation, it is recommended that the site be seeded in native grass and removed from agricultural production.

## 140S112

140S112 consists of a light lithic scatter located along the shoreline of a peninsula formed by the inundation of Turkey Creek and an intermittent stream (Figure 35). The site is situated on upland terrain approximately 460 m northeast of the confluence of Turkey Creek with the Marais des Cygnes River. When investigated, the site was covered with cockleburs and scrub willow. Surface visibility ranged from 100 percent along the shoreline to less than 5 percent further inland (Figure 36). Shoreline erosion has deflated the topsoil for a distance of up to 6 m inland.

The mapping of surface artifacts delineated a debris scatter extending for a distance of 240 m along the western shore and for 270 m along the eastern shore of the peninsula. The most concentrated scatters of debris were observed along the lower or southern end of the peninsula. This site extends over approximately 18,912 sq m. A grid was established and a total of 27 shovel cuts were excavated at 20 m intervals along the grid system to locate any artifact concentrations in areas of poor visibility. None of the shovel cuts located any cultural materials. Consequently, a transect consisting of eight one by one m test units at 25 m intervals was located bisecting the center of the peninsula and paralleling the shorelines (Figure 35). The excavation of these test units produced only three pieces of shatter, which were recovered from the upper 20 cm of Test Units 3, 4 and 6.

### Soil Stratigraphy

140S112 is located on soils mapped by the Osage County Soil Survey as Summit silty clay loam. Summit soils are moderately sloping, moderately drained soils situated on convex side slopes. The upper 33

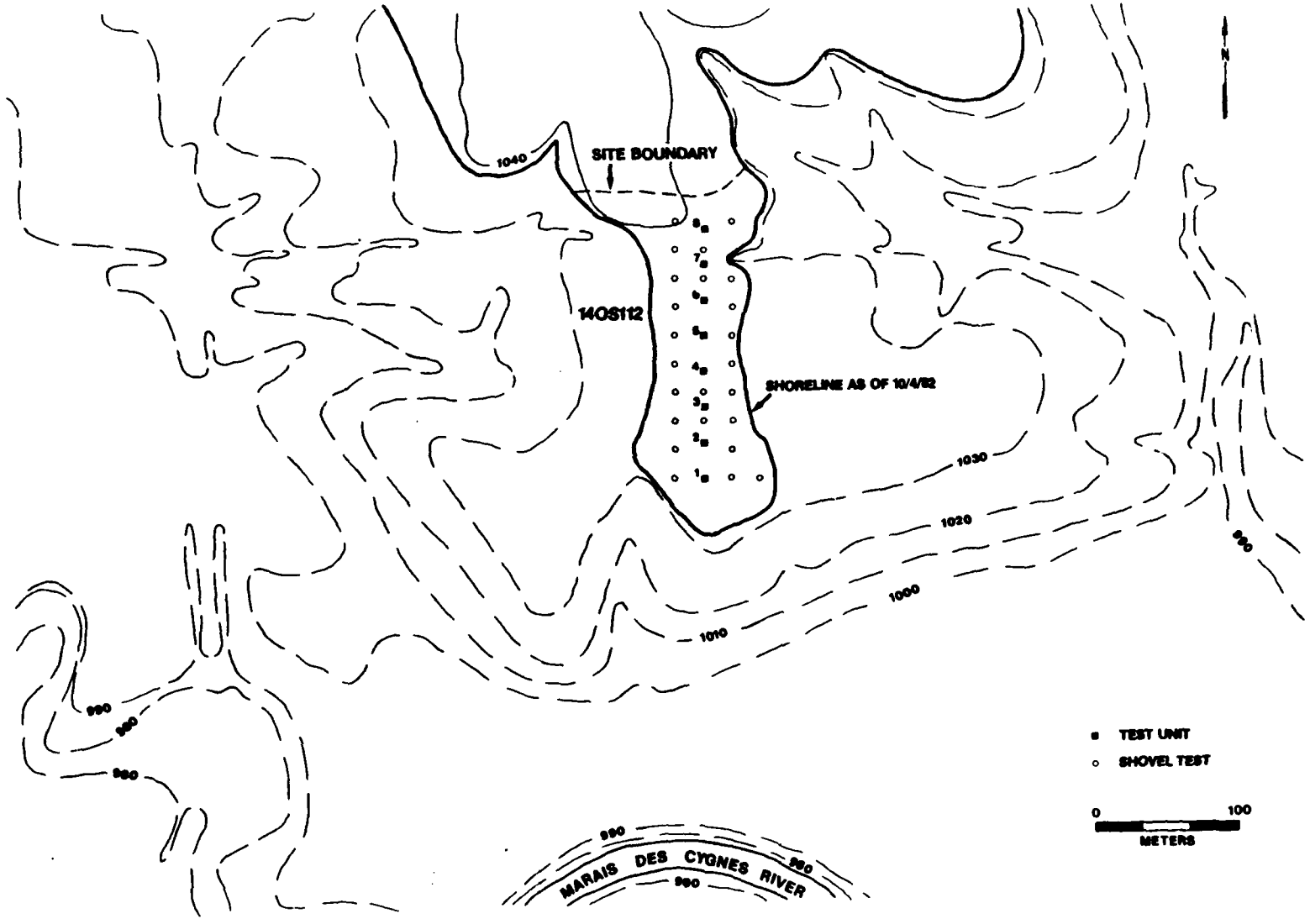



Figure 35. Location and plan view of test excavations at 140S112.



Figure 36. General views of 140S112 and 140S116. Test excavations in progress at 140S112 (upper). Test excavations in progress at 140S116 (lower).

cm of this soil consists of a black silty clay loam followed by a mottled very firm silty clay extending from 100 to 150 cm in depth. All of the test units at 140S112 exhibited similar profiles and the profile of Test Unit 4 is presented below.

| | | |
|---|---|---|
| C | 0-14 cm | Very dark grayish brown (10YR3/2) silt; fine granular structure; silt is mixed with beach sands. |
| IIAB | 14-33 cm | Very dark grayish brown (10YR3/2) silty clay loam; moderate, very fine subangular blocky structure. |
| IIBt | 33-53+cm | Very dark grayish brown (10YR3/2) silty clay; strong moderate subangular blocky structure; small reddish brown oxidized mottles present, occasional medium sand grains present. |

The upper C horizon represents recent lake deposited silts. The very limited number of cultural materials from the site were recovered from the upper IIAB horizon.

## Artifact Assemblage

A total of 180 pieces of debris were recovered from 140S112. This material includes 15 chipped stone tools, 116 pieces of lithic manufacturing debris, two burnt rocks and 47 unworked stones (Table 25).

The chipped stone tools recovered from 140S112 consist of two biface fragments, two scrapers, one notch and nine edge-modified flakes. Both of the biface fragments are midsections. Scrapers include both end and side scrapers. The end scraper was manufactured from a small flake and exhibits steep marginal retouch along the distal edge and both lateral margins. The side scraper is a multifunctional tool that exhibits steep marginal retouch on one lateral margin and attritional wear indicating use as a cutting tool on the opposite lateral margin. The distal end has several worn projections which were probably utilized in perforating or graving activities. The remaining tools include a perforator manufactured from a small flake, a chunk which exhibits a relatively broad and deep retouched notch indicating usage as a spokeshave and eight modified flakes utilized in light cutting and scraping tasks. One of the edge-modified flakes consists of a small fragment of obsidian. Seven of the chipped stone tools have been heat treated.

The lithic manufacturing debris from 140S112 consists entirely of flakes and shatter. Material from the shoreline surface includes 96 flakes and 17 pieces of shatter. The remainder of the debitage was recovered from the test units and consists of three pieces of shatter. Approximately 32 percent of the flakes have been thermally altered. Primary and secondary decortication flakes, as well as chips, were observed in the assemblage. Chert colors range from brown and gray to

white. The cortex on the brown cherts indicates that this raw material was derived from alluvial gravels. Other higher quality, blue-gray and white cherts were likely derived from bedrock outcrops.

## Discussion and Recommendations

The investigations at 14SO112 delineated an extensive scatter of cultural materials along the shoreline. Subsurface investigations demonstrated that there is very little cultural material located inland from the shoreline scatter. The three artifacts recovered from the test excavations are from the cultivation zone. The chipped stone tools indicate that activities associated with butchering, hideworking,

Table 25. Artifact assemblage from 140S112.

| | Test Units | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 8 | | |
| CHIPPED STONE TOOLS | | | | | | | |
| Bifacial Knives | | | | | | 2 | 2 |
| Scrapers | | | | | | 2 | 2 |
| Perforator | | | | | | 1 | 1 |
| Notch | | | | | | 1 | 1 |
| Edge-Modified Flakes | | | | | | 9 | 9 |
| Total | | | | | | 15 | 15 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | |
| Flakes | | | | | | 96 | 96 |
| Shatter | 1 | 1 | | 1 | | 17 | 20 |
| Total | 1 | 1 | | 1 | | 113 | 116 |
| BURNT ROCK | | | | 2 | | | 2 |
| UNWORKED STONE | | 1 | 5 | 1 | 3 | 37 | 47 |
| TOTAL | 1 | 2 | 5 | 4 | 3 | 165 | 180 |

perforating and light-duty cutting and scraping were performed at the site. The lithic manufacturing debris consists entirely of flakes and

shatter. No cores or chunks were recovered. However, the presence of primary and secondary decortication flakes indicates that lithic tool manufacturing was conducted at this site. Based on the chipped stone tools, 140S112 appears to represent a hunting camp.

The cultural affiliation of the site cannot be determined from the data recovered. The concentration of the lithic debris distributed along the shorelines of the peninsula is interpreted to result from wave action. The densest artifact concentrations were observed along the southern tip of the peninsula and waves could have easily transported the lighter artifacts northward along both shorelines. Based on the disturbed condition and lack of subsurface integrity, 140S112 has a very limited potential to contribute significant data on the prehistory of the region. The site is not recommended to be eligible for the National Register.

## 140S113

This site consists of a light lithic scatter approximately 30 m in diameter which is situated on a terrace of Turkey Creek, not far from the terrace's juncture with upland terrain (Figure 27). This terrace remnant in the site vicinity is almost totally devoid of soil and vegetation and had a surface visibility of nearly 100 percent. The cultural material was located on a recently deposited gravel bar.

A two man crew made several traverses over this site at two m intervals. As a result of this intensive scrutiny, a total of 10 artifacts were recovered. This material includes one ovate bifacial knife fragment, two edge-modified flakes and seven flakes. Only one of these artifacts has been thermally altered.

The cultural and temporal affiliation of this site cannot be determined from the data recovered. The site is located in a highly disturbed context and the cultural materials may have been transported from another locale and deposited on the gravel bar. Based on this consideration, 140S113 did not warrant testing to determine its eligibility for the National Register. Due to the disturbed nature of the site area, lack of content and probability that the cultural materials are not in situ, 140S113 is not recommended to be eligible for the National Register.

## 140S114

This site consists of a light lithic scatter located along the north side of Melvern Lake (Figure 27). The site is situated on the slopes on soils mapped as the Lebo-Summit series by the Osage county soil survey. The site is approximately 240 m west of a sharp northward meander of the Marais des Cygnes River. Cultural debris was recovered from a sand and gravel bar covered with scrub willow and extended for a distance of 40 m along the shoreline.

This site was first located in July of 1982 and a total of eight artifacts were recovered. The surface visibility ranged from 100 percent along the shoreline to 30 percent farther inland. The site was investigated again in October when a systematic shovel testing program at 10 m intervals was initiated. A total of 25 shovel cuts were excavated, all of which recovered no cultural material. However, an additional ten artifacts were recovered from the surface.

The cultural material recovered from 140S114 consists of two bifacial knife fragments, two marginally retouched scrapers, one edge-modified flake, 12 flakes and a piece of shatter. Eight of these artifacts have been thermally altered. The cultural and temporal affiliation of this site cannot be determined from these data.

140S114 may represent a small limited use-site or camp; however, the location of the cultural debris on a recently deposited sand and gravel bar indicates that this debris was probably transported by wave action from another locale. This interpretation is supported by the lack of cultural materials inland and by the location of two previously recorded sites in the vicinity of 140S114. 140S4 was reported by Birkby in 1962 and is listed as an earthen mound 20 by 12 ft across. The site was excavated and a human left femur and the lower front leg bone of a cow or bison was recovered. 140S4 is situated approximately 100 m south of 140S114. 140S318 is situated approximately 180 m south of 140S114. This site was reported by Wilmeth in 1958 who determined that it extended over several acres and suggested a Plains Village period cultural affiliation for the site. Both 140S4 and 140S318 have been inundated by Melvern Lake.

Based on the lack of content and subsurface integrity and the probability that the cultural debris observed are not in situ, 140S114 did not warrant further testing. 140S114 is not recommended to be eligible for the National Register.

## 140S115

This site consists of an extremely light lithic scatter recovered from a sand and gravel bar located on the shoreline of Melvern Lake on the west side of Little Cable Creek (Figure 27). The site is situated on upland slopes and on soils mapped as the Olpe-Kenoma complex. The vicinity of the site was covered with scrub willow and the surface visibility ranged from 30 to 100 percent.

Only three artifacts were recovered from 140S115, including one unnotched triangular arrow point (Figure 37a), one marginally retouched scraper and a piece of shatter. The excavation of two transects of shovel cuts at a 10 m interval failed to recover any additional cultural material.

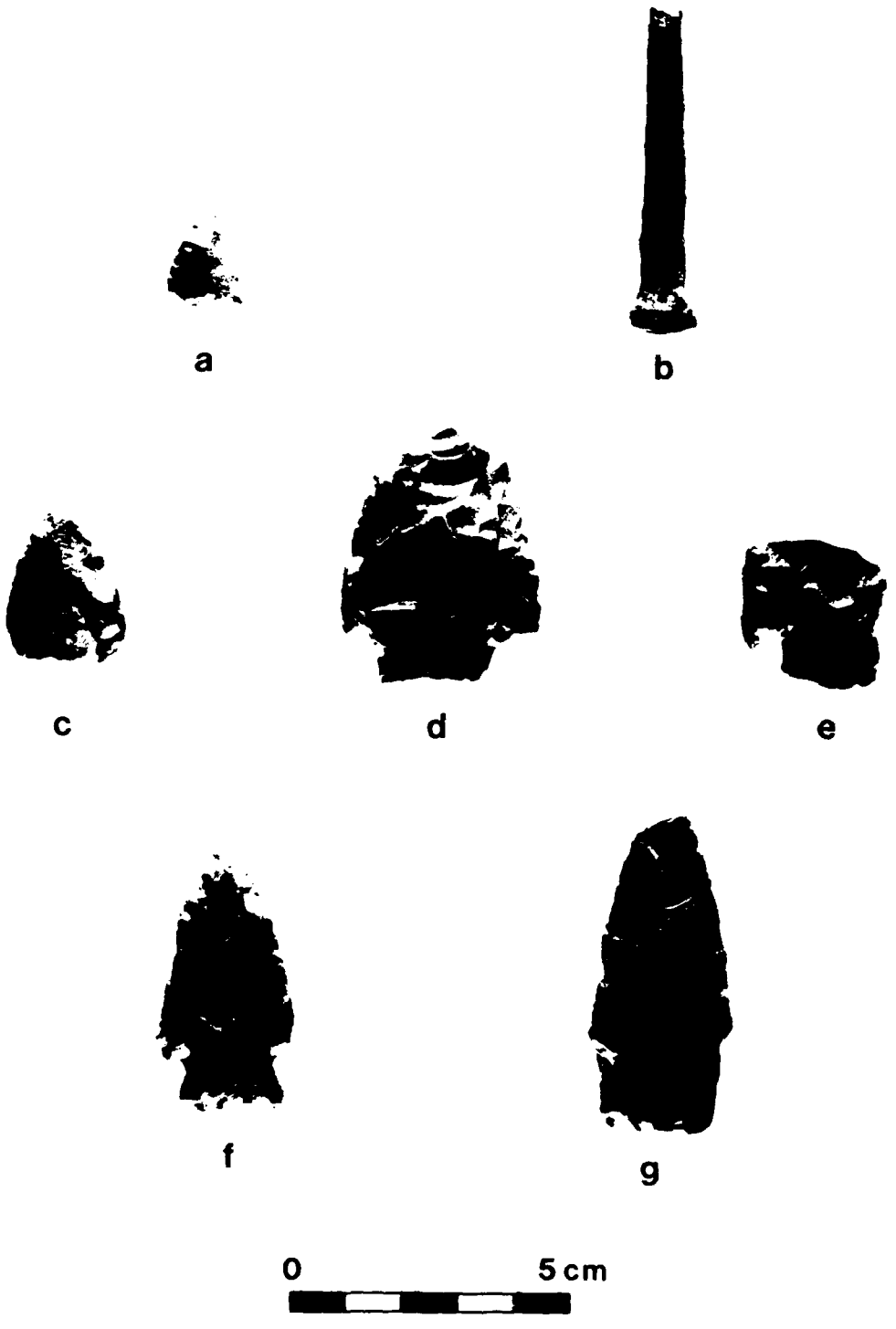



Figure 37. Artifacts recovered from 140S115, 140S116, 140S117, 140S118, 140S119, 140S120, and 140S362: a, projectile point from 140S115; b, square nail from 140S116; c, triangular knife from 140S117; d-e, projectile points from 140S119; f, projectile point from 140S119; g, projectile point from 140S120; h, projectile point from 140S362.

140S115 represents a small, limited-use site. The recovery of the unnotched arrow point indicates that this site probably dates to the Plains Woodland or Plains Village periods. A more precise cultural or temporal placement is not possible based on the available data. The recovery of this material from a sand and gravel bar suggests that it may not be in situ. However, there are no previously recorded sites in close proximity to 140S115. Based on the limited content and lack of subsurface integrity, 140S115 is not recommended to be eligible for the National Register.

## 140S116

This site consists of a light prehistoric lithic scatter and a moderately dense historic scatter observed along the shoreline of a peninsula located at the southeastern end of Melvern Lake (Figure 38). The site is situated on upland terrain in the Coeur d'Alene Recreation Area. This location is approximately 120 m west of the now inundated channel of the Marais des Cygnes River. Surface visibility ranged from 100 percent along the shoreline to less than 20 percent in the grass covered park (Figure 36).

Mapping of the surface artifacts indicated the presence of a debris scatter extending for a distance of 250 m along the peninsula's shoreline and over an area of approximately 14,660 sq m. The remains of a small foundation were also located. Shovel cuts were excavated at 20 m intervals to determine if any artifact concentrations were located on the peninsula. Only three of the 23 shovel cuts produced cultural materials. Two test unit transects consisting of six one by one m test pits were then located so as to bisect the peninsula and parallel the shoreline (Figure 38). The excavations recovered a total of 74 pieces of debris restricted to the upper 25 cm of the soil profile.

The historic component of the site consists of a demolished late 19th century farmstead. Historic atlases, Government Land Office records, county histories and plat books were reviewed to provide additional data on the historic occupation of 140S116. The patent on the site was issued December 20, 1865 when R. S. Stevens purchased the entire quarter section. On June 24, 1878 H. M. Sook purchased the quarter section from Stevens. The 1879 Atlas of Osage County lists Sook as owner of this property, but no structures are shown at the location of 140S116. On September 11, 1883 Mathew Kirkpatrick purchased the quarter section. The 1899 Atlas of Osage County shows one structure at the location of 140S116 owned by the Kirkpatricks. One additional structure is also shown on the 1918 atlas as belonging to M. Kirkpatrick. The farmstead along with the entire NE ¼ section was retained by the Kirkpatrick family until the construction of Melvern Lake. When Real Estate Tract Number 107 was purchased by the U. S. Army Corps of Engineers from Maude Kirkpatrick, a total of six structures were located just west of a section line road at the location of 140S116. All traces of five of the structures and the section line road have been obliterated by dam and park construction activities. Only a

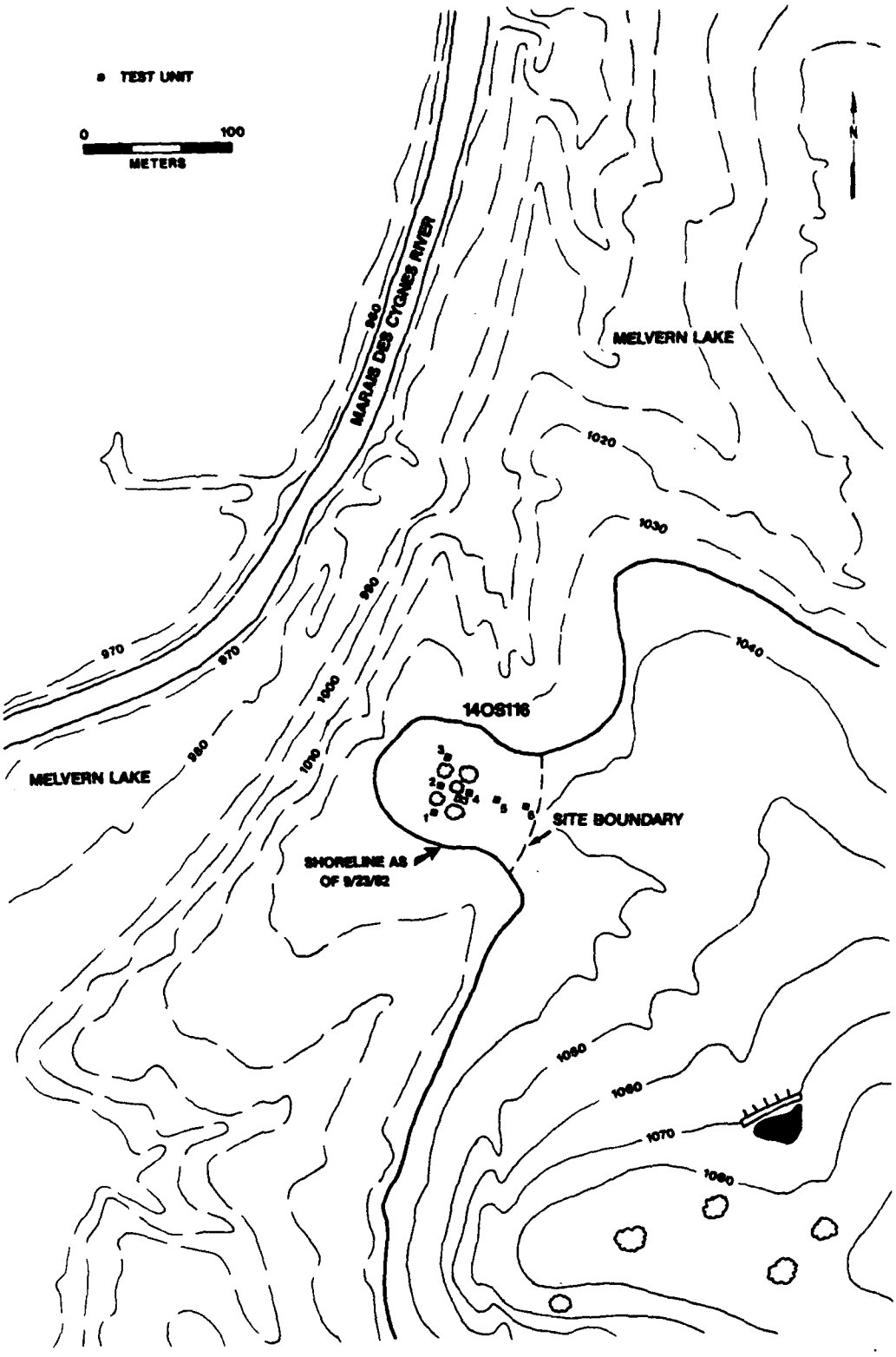



Figure 38. Location and plan view of test excavations at 140S116.

small portion of the foundation of the northern-most building remains and it is in a highly disturbed context.

## Soil Stratigraphy

140S116 is situated on soils mapped by the Osage County Soil Survey as belonging to the Clareson-Eram complex. These upland soils are moderately deep soils formed on moderately to strongly sloping convex ridge tops and slopes. Inspection of the soils at 140S116 indicate that the site is located on Clareson silty clay loam. Clareson soils typically have an upper very dark brown silty clay loam extending to 40 cm in depth followed by a flaggy silty clay loam extending from 60 to 100 cm in depth. Many of the test units excavated at 140S116 exhibited disturbed profiles due to the historic occupation and later razing of this component. The profile of Test Unit 6 appears to have been minimally disturbed and is presented below.

| | | |
|---|---|---|
| A | 0-16 cm | Very dark gray (10YR3/1) silty clay; strong moderate subangular blocky structure. |
| AB | 16-38 cm | Very dark grayish brown (10YR3/2) silty clay; strong moderate subangular blocky structure. |
| Bt | 38-50+cm | Dark brown (10YR3/3) silty clay; moderately developed moderate subangular blocky structure. |

All of the historic and prehistoric artifacts recovered from the test excavations at 140S116 are associated with the A and AB soil horizons. No cultural materials were associated with the Bt horizon.

## Artifact Assemblage

A total of 245 pieces of debris were recovered from 140S116. This material includes 23 chipped stone tools, 113 pieces of lithic manufacturing debris, 90 historic artifacts and 19 burnt rocks and unworked stones (Table 26). The chipped stone tools include two biface fragments, two marginally retouched scrapers, one perforator, 16 edge-modified flakes and two edge-modified chunks. All but two of the edge-modified flakes were recovered from the shoreline. Both of the scrapers are small fragments of marginally retouched flake scrapers. The perforator was manufactured from a medium-sized flake and exhibits retouch on the lateral edge. Eleven of the chipped stone tools have been thermally altered. These implements were manufactured primarily from local brown and gray cherts.

Flakes, chunks and shatter constitute the most numerous group of artifacts recovered from 140S116. The flakes are primarily small, secondary reduction elements. Approximately 31 percent of the flakes and chunks have been thermally altered.

Table 26. Artifact assemblage from 140S116.

| | Test Units | | | | | | Shovel Tests | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| CHIPPED STONE TOOLS | | | | | | | | | |
| Biface Fragment | | | | | | | | 2 | 2 |
| Scrapers | | | | | | | | 2 | 2 |
| Perforator | | | | | | | | 1 | 1 |
| Edge-Modified Flakes | | | | | | 2 | | 14 | 16 |
| Edge-Modified Chunks | | | | | | | | 2 | 2 |
| Total | | | | | | 2 | | 21 | 23 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | |
| Flakes | 2 | 1 | 1 | 6 | 1 | 1 | | 62 | 74 |
| Chunks | | 1 | | | | | | 6 | 7 |
| Shatter | | | | | 2 | 1 | 3 | 26 | 32 |
| Total | 2 | 2 | 1 | 6 | 3 | 2 | 3 | 94 | 113 |
| BURNT ROCK | | 3 | | 2 | | | | | 5 |
| UNWORKED STONE | 2 | 1 | | 11 | | | | | 14 |
| HISTORIC ARTIFACTS | | | | | | | | | |
| Ceramics | 8 | 3 | | 3 | | | | 44 | 58 |
| Glass | 14 | | | 3 | | | | 10 | 27 |
| Metal | 1 | 1 | | 1 | | | | 2 | 5 |
| Total | 23 | 4 | | 7 | | | | 56 | 90 |
| TOTAL | 27 | 10 | 1 | 26 | 3 | 4 | 3 | 171 | 245 |

Historic artifacts include 22 pieces of crockery, 33 fragments of white ware cups and plates, 27 pieces of glass, three pieces of drain tile and five pieces of metal. The crockery and white ware fragments are common late nineteenth century and early twentieth century artifacts. All of the glass fragments are pieces of bottles and plates, except for one piece of window glass and two marbles. The metal artifacts include three square cut nails (Figure 37b), one staple and one unidentified piece of metal.

## Discussion and Recommendations

140S116 is a multicomponent site consisting of a prehistoric component of unknown cultural affiliation and an Historic Euroamerican farmstead. Test excavations recovered small amounts of prehistoric debris from all test units; however, all of this material is restricted to the upper 25 cm of the soil profile. Most of the prehistoric materials were recovered from the shoreline. Based on the test excavations and shoreline artifact mapping, the prehistoric component covers an area of 9000 sq m. Analysis of the chipped stone tool assemblage indicates that activities associated with light-duty cutting, scraping and perforating were conducted at the site. Ground stone tools, woodworking tools, such as spokeshaves and heavy digging implements, are also absent from the assemblage. No middens, features, or preserved faunal or floral remains were observed. These data indicate that the prehistoric component of 140S116 represents an extensive limited use area or briefly occupied residential camp. The entire site vicinity as been extensively disturbed by landscaping operations performed during the construction of the Coeur d'Alene Recreation Area. Based on the limited content, lack of subsurface integrity and the disturbed nature of the site area, the prehistoric component of 140S116 is not eligible for nomination to the National Register.

The historic component of 140S116 consists of the remains of an Historic Euroamerican farmstead. The first structure was built between 1883 and 1899 by the Kirkpatrick family who apparently lived at and expanded this farmstead until its purchase by the U. S. Army Corps of Engineers in the mid-1960s. The farmstead was razed during the construction of Melvern Lake. Based on the relatively recent nature of the historic occupation and its highly disturbed condition, the historic component of 140S116 is not recommended to be eligible for the National Register.

## 140S117

This site consists of a light scatter of prehistoric lithics and the foundation of an Historic period structure situated on upland slopes mapped as the Dennis soil series by the Osage County Soil Survey (Figure 27). The site is located approximately 600 m northeast of the confluence of Standifred Creek and the Marais des Cygnes River. The site was covered with high weeds and trees with surface visibility ranging from 0 to 30 percent when the site was located.

Two biface fragments, one flake knife, five flakes, a piece of shatter and two pieces of burnt rock were recovered from an approximately 500 sq m area. One of the bifaces is probably the proximal section of a stemmed dart point; however, it is insufficiently complete for definite classification. The flake knife consists of a marginally retouched triangular flake which exhibits attritional wear on its lateral edges. This specimen may also have functioned as an

unnotched triangular dart point (Figure 37c). The remaining cultural materials consist of small, secondary flakes and a piece of shatter. The temporal and cultural affiliations of the prehistoric component cannot be determined from these data.

The historic component of 140S117 consists of a basement foundation faced with uncut limestone. The foundation is approximately six m long, five m wide and 1.5 m deep. This foundation probably represents a basement of a small house or a root cellar. One piece of glass, two fragments of common white ware and a piece of crockery are the only Historic period artifacts recovered from the site.

A search of historic documents including Government Land Office records, various county atlases, plat books and local histories was conducted to identify the historic component of 140S117. The property in question was patented on December 2, 1865 and purchased by J. McManus. McManus sold all of the NW ¼ of Section 7 to Seyferl McManus and Company in 1867. In 1872, J. C. Thomas purchased the northeastern one quarter of this quarter section, before selling the property in 1876 to L. Humphrey. The 1879 Atlas of Osage County lists L. Humphrey as the landowner and shows a house belonging to the Humphrey's located approximately 150 m northwest of 140S117. The 1899 and 1918 atlases provide the same data. No structures were shown at the location of 140S117 in these documents. The Humphrey's house is not located on the USGS 7.5 minute Reading Quadrangle Map or the U. S. Army Corps of Engineers project maps, indicating that the Humphrey's house was destroyed prior to 1963. It cannot be determined from these data if there is a connection between the Humphrey's house and 140S117, but this site could easily be an outbuilding associated with the Humphrey's farmstead. A possible alternative interpretation is that this site represents one of the stone houses constructed for the Sauk and Fox Indians in 1858. At least 164 frame and stone houses were built by the government at the Indians' expense. This was an attempt to forcefully acculturate the Sauk and Fox to Euroamerican ways, an attempt which was largely unsuccessful. Most of the Indians utilized the houses as stables and continued to live in a traditional manner (Copple 1970). However, there is no mention of this government constructed housing having basements.

140S117 was determined to be located just outside the project area and, consequently, was not tested. A determination of National Register eligibility cannot be made based on the survey data. The historic component of 140S117 is in a good state of preservation and may be a significant cultural resource.

## 140S118

This site consists of a light to moderate density lithic scatter located approximately 460 m northwest of the confluence of Puleston Creek with the Marais des Cygnes River (Figure 39). The site is

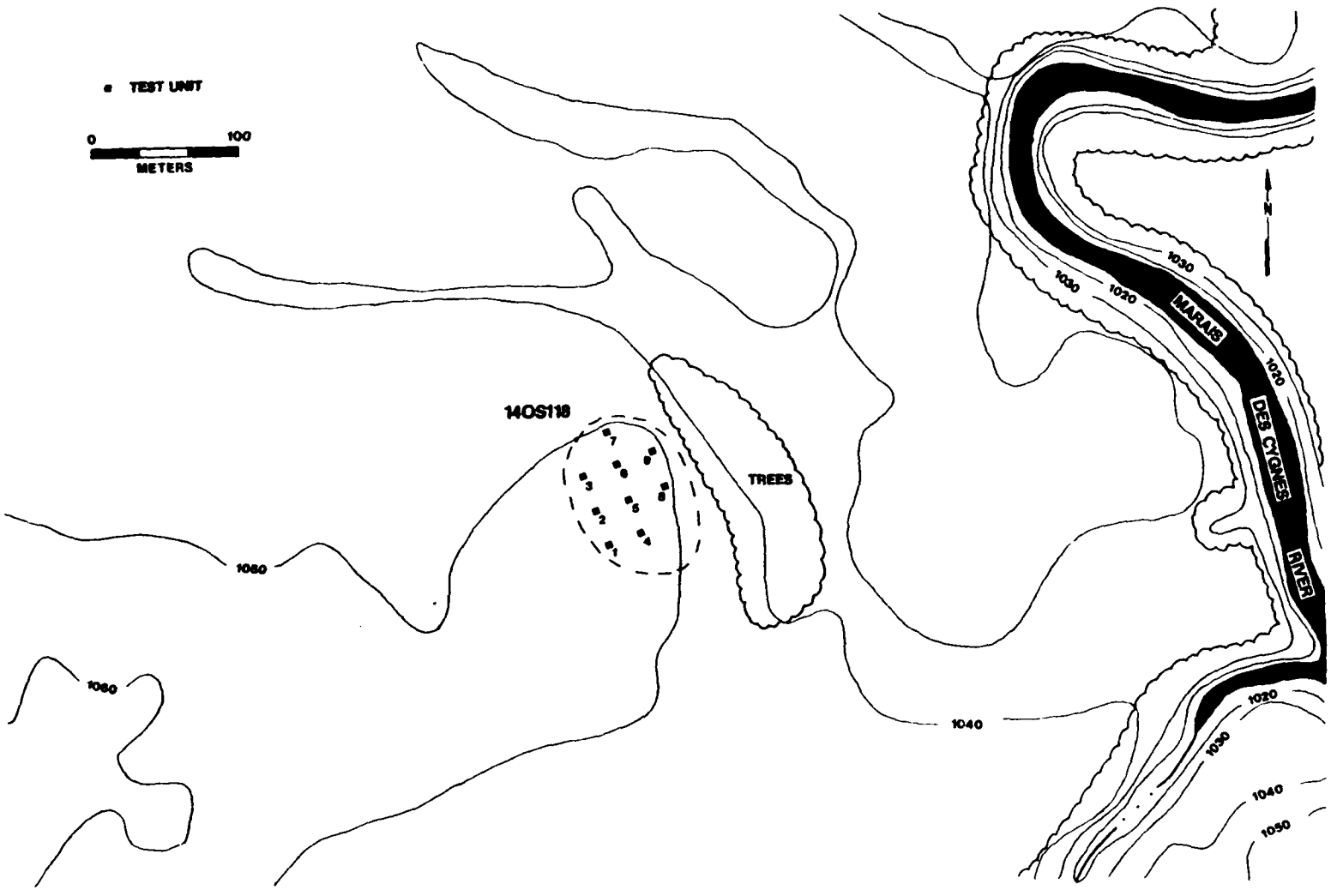



Figure 39. Location and plan view of test excavations at 140S118.

situated on soils mapped as the Dennis series. When these investigations were conducted, part of the site area was covered in grass, but most of the site area was located in a cultivated field of high sorghum (Figure 40). The surface visibility ranged from less than 10 percent in the grassy areas to approximately 60 percent in the sorghum field.

Mapping of all surface artifacts delineated a site extending over an area of approximately 9200 sq m. Three test unit transects consisting of nine one by one m test units were located so as to crosscut the densest artifact concentrations (Figure 39). Test units were located at 20 m intervals. The test excavations demonstrated that cultural materials were present in all test units and that this debris was restricted to the upper 25 cm of the soil profile. The highest concentrations of artifacts were recovered from Test Units 5, 6 and 8.

## Soil Stratigraphy

140S118 is located on soils mapped by the Osage County Soil Survey as the Dennis silt loam. This upland soil forms on convex lower side slopes and ridge tops. Dennis soils are typified by a very dark brown to very dark grayish brown silt loam to silty clay loam extending from the surface to a depth of 36 cm. The subsoil extends to a depth of 152 cm and consists of a mottled firm silty clay loam. Several of the test units excavated at 140S118 exhibited truncated soil profiles with most or all of the A horizons missing. The profile of Test Unit 1 which retained most of A horizons is presented below.

| | | |
|---|---|---|
| A2p | 0-17 cm | Very dark grayish brown (10YR3/2) silty clay loam; granular structure. |
| BA | 17-26 cm | Very dark gray (10YR3/1) silty clay; moderate very fine subangular blocky structure. |
| Bt1 | 24-44 cm | Dark brown silty clay (10YR3/3) with very dark gray (10YR3/1) mottles; moderate subangular blocky structure. |
| Bt2 | 44-60+cm | Dark brown (10YR3/3) silty clay; strong moderate subangular blocky structure, light clay skings between peds. |

The profile of Test Unit 1 indicates that the A1 horizon has been eroded. Cultural materials are associated with the A2, BA, and upper Bt1 horizons.

## Artifact Assemblage

A total of 452 artifacts were recovered from 140S118. This material consists of 88 chipped stone tools, 345 pieces of lithic



Figure 40. General views of 140S118 and 140S352. Test excavations in progress at 140S118 (upper). Test excavations in progress at 140S352 (lower).

manufacturing debris, 13 burnt rocks and six unworked stones. The distribution of this debris by class is presented in Table 27.

A substantial collection of chipped stone tools consisting of four projectile points, two bifacial knives, one bifacial blank, six biface fragments, four scrapers, one flake knife, and 70 pieces of edge-modified debitage was recovered from 140S118. Nine of the 88 chipped stone tools were recovered from the test excavations and the remaining 79 tools were surface finds. Approximately 34 percent of the chipped stone tools exhibit evidence of thermal alteration.

The four projectile points from 140S118 include three surface finds and one from the upper 20 cm of Test Unit 8. The specimen from Test Unit 8 is a large corner-notched dart point with a straight stem and a relatively broad subtriangular blade (Figure 37d). The corner notches are broad and deep, producing prominent shoulders. This dart point has a compound fracture consisting of a distal impact fracture and a transverse fracture across the stem. The basal morphology cannot be determined. This specimen was manufactured from an ovate preform and has a plano-convex cross-section. The second specimen consists of a medium sized subtriangular corner-notched dart point with a lenticular cross-section (Figure 37e). The corner notches are narrow and deep, producing prominent barbs. This specimen exhibits a compound fracture consisting of a transverse fracture located above the shoulder, a lateral edge fracture which removed one of the barbs and a transverse fracture across the base. The basal morphology cannot be determined. The remaining specimens are small projectile point fragments. One is the lateral edge fragment of a corner-notched dart point and the other specimen is the proximal end of a contracting stemmed or lanceolate point. The basal morphology cannot be determined due to a transverse fracture.

Unstemmed bifaces recovered from 140S118 include two bifacial knives, one blank and six fragments. The bifacial knives include one distal fragment and one midsection. Both tools exhibit attritional wear. The six biface fragments are probably pieces of knives or points.

Four scrapers were recovered from the surface of 140S118. These include one bifacial side scraper, two unifacial side scrapers and one marginally retouched flake scraper. All of the scrapers were manufactured from flake blanks and exhibit steeply angled facial or marginal retouch and step fracture wear. Two of the specimens are multifunctional tools and exhibit attritional wear indicating use as cutting tools. A single marginally retouched flake knife was recovered from 140S118. This specimen was manufactured from a flake blank and exhibits bidirectional retouch with attritional wear on one lateral edge. The remainder of the chipped stone tools consist of 69 edge-modified flakes and one edge-modified chunk.

The lithic manufacturing debris consists of one core, 251 flakes, 11 chunks and 82 pieces of shatter. The test excavations produced a total of 131 pieces of this debris and the remaining 214 pieces were from the surface. Approximately 36 percent of the flakes and chunks

appear to have been heated. The flakes include primary and secondary decortication flakes, bifacial thinning flakes, secondary reduction flakes and chips. Intermediate reduction flakes constitute the bulk of the assemblage. The balance of materials recovered from 140S118 consists of 13 burnt rocks and six pieces of unworked stone.

Table 27. Artifact assemblage from 140S118.

| | Test Units | | | | | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | |
| CHIPPED STONE TOOLS | | | | | | | | | | | |
| Projectile Points | | | | | | | | 1 | | 3 | 4 |
| Bifacial Knives | | | | | | | | | 1 | 1 | 2 |
| Bifacial Blank | | | | | | | | | | 1 | 1 |
| Biface Fragments | | | | | | | | | | 6 | 6 |
| Scrapers | | | | | | | | | | 4 | 4 |
| Flake Knives | | | | | | | | | | 1 | 1 |
| Edge-Modified Flakes | 1 | | | 1 | 3 | 1 | | | 1 | 62 | 69 |
| Edge-Modified Chunk | | | | | | | | | | 1 | 1 |
| Total | 1 | | | 1 | 3 | 1 | | 1 | 2 | 79 | 88 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | | |
| Core | | | | | | | | | | 1 | 1 |
| Flakes | 3 | 1 | 5 | 3 | 25 | 18 | 5 | 21 | 12 | 158 | 251 |
| Chunks | | | | 2 | | | | | | 9 | 11 |
| Shatter | 2 | | | | 12 | 5 | | 16 | 1 | 46 | 82 |
| Total | 5 | 1 | 5 | 5 | 37 | 23 | 5 | 37 | 13 | 214 | 345 |
| BURNT ROCK | | | 1 | | | | | 2 | 2 | 8 | 13 |
| UNWORKED STONE | 1 | | 1 | | 4 | | | | | | 6 |
| TOTAL | 7 | 1 | 7 | 6 | 44 | 24 | 5 | 40 | 17 | 301 | 452 |

## Discussion and Recommendations

The investigations conducted at 140S118 resulted in the definition of a large lithic scatter covering 9200 sq m, as well as the recovery of a substantial artifact assemblage. Test excavations determined that the

cultural materials are restricted to the upper 25 cm of the soil profile.

Analysis of the artifact assemblage from 140S118 indicates that activities associated with hunting, butchering, hide preparation and various light-duty cutting, scraping and perforating tasks were conducted at the site. Chipped stone tool manufacture and maintenance also occurred at the site. The lithic manufacturing debris indicates that the emphasis was on chipped stone tool maintenance and modification as opposed to initial lithic reduction activities. No ground stone tools or heavy chipped stone tools associated with plant food procurement or processing were recovered. The available data indicate that 140S118 represents a large hunting camp. The large size of the site is probably the result of multiple and perhaps seasonal occupations by the same cultural group. Only two temporally diagnostic artifacts were recovered. Both of these are corner-notched dart points which probably relate to the Plains Woodland period. Finer distinctions on the cultural and temporal affiliations of 140S118 cannot be determined from the data recovered.

In summary, 140S118 represents a large repeatedly occupied hunting camp. Based on the two corner-notched projectile points, the site is believed to date to the Plains Woodland period. The absence of implements associated with plant food procurement and processing may indicate that the site was occupied during seasons when these resources were of limited availibility. No cultural middens or features were encountered during the test excavations.

Although 140S118 apparently lacks subsurface integrity, the site contains a relatively high frequency of chipped stone tools and lithic manufacturing debris. The systematic mapping and analysis of this material would provide valuable data on the internal structure of Plains Woodland hunting camps. Based on these considerations, 140S118 is recommended to be eligible for the National Register. The site is being impacted by agricultural production. To preserve the remaining cultural materials at the site, it is recommended that the site be taken out of agricultural production.

## 140S119

This site consists of a very light lithic scatter located on Verdigris soils in a lowland alluvial setting approximately 60 m east of the now inundated creek channel of Winnifred Creek near the base of an eroded bluff (Figure 27). When the site was located, the surface visibility ranged from 90 to 100 percent. A total of five artifacts were recovered from a 10 sq m area on the surface of a deposit of slope wash. Included are one projectile point, three flakes and one piece of shatter. The projectile point is a corner-notched dart point with an expanding stem and a straight base. This specimen was manufactured from a triangular preform and has a lenticular cross-section (Figure 37f). The debitage includes one small primary decortication flake, two small secondary thinning flakes and one piece of shatter.

140S119 probably represents a limited use site. The corner-notched projectile point is similar to forms used in the Plains Woodland period which suggests a Plains Woodland cultural affiliation for this site. The recovery of the cultural debris from slopewash overlying sterile clay indicates that these artifacts are not in situ. Based on the lack of content and the disturbed context in which the site is located, 140S119 did not warrant further testing. 140S119 is not recommended to be eligible for the National Register.

## 140S120

This site consists of a very light lithic scatter located on the south side of Melvern Lake at the base of an eroded bluff slope (Figure 27). This location is approximately 180 m west of a meander of the Marais des Cygnes River and is mapped as the Clareson-Eram soil series. When located, no vegetation was present on the site area, although dead trees and driftwood had accumulated along the shoreline. Surface visibility ranged from 70 to 100 percent.

Intensive surface examination of the site vicinity resulted in the recovery of one projectile point, one biface and one edge-modified flake. These artifacts were recovered from the surface of sterile clay which overlies the bedrock outcroppings. The projectile point is a slightly contracting stemmed dart point with a triangular blade and a straight base (Figure 37g) manufactured from a narrow, triangular preform with a lenticular cross-section. The biface is a compound bifacial knife and a scraper. The edge-modified flake exhibits attritional wear on its distal end, resulting from use in cutting tasks.

140S120 represents a limited-use site. The recovery of two cutting implements and a projectile point with an impact fracture suggests that hunting and subsequent butchering activities occurred at this site. The absence of any unutilized debitage tends to support this interpretation. The site area has been heavily impacted by shoreline erosion, and therefore, other artifact classes may once have been present and have since been washed away. The style of the projectile point suggests a Plains Archaic cultural affiliation. Based on the lack of content and the highly disturbed context in which the site is situated, 140S120 did not warrant further testing. 140S120 is not recommended to be eligible for the National Register.

## 140S121

This site consists of a very light lithic scatter observed along a 25 m stretch of shoreline on the south side of Melvern Lake (Figure 27). The site is situated on upland terrain mapped as the Clareson-Eram soil series near the base of an eroded bluff slope approximately 180 m south of the Marais des Cygnes River. The surface visibility ranged from 100 percent along the shoreline to less than 20 percent further inland.

Two bifaces and three flakes were recovered from a shoreline silt, sand and gravel bar. One of the bifaces is a fragment of a rectangular blank and the second is of insufficient size for classification. The flakes are small, secondary reduction elements. The excavation of ten shovel cuts at 10 m intervals failed to locate any additional cultural material.

The recovery of the artifacts from a shoreline sand bar indicates that this material is possibly not in situ. This interpretation is strengthened by the failure to recover additional artifacts as a result of shovel testing and by the presence of a previously recorded inundated site in the vicinity of 140S121. This site, 140S31, was reported by Bradley (1968) and was located approximately 90 m northeast of 140S121 on the T-1 terrace of the Marais des Cygnes. Bradley found concentrations of daub, bone, limestone and debitage at 140S31. The cultural affiliation of 140S31 is unknown. Based on the lack of content, disturbed context and probability that the cultural materials were washed in from 140S31, 140S121 is not recommended to be eligible for the National Register.

## 140S122

This site consists of a very light lithic scatter observed along a 30 m stretch of shoreline on the south side of Melvern Lake (Figure 27). The site is situated on soils mapped as the Clareson-Eram complex by the Osage county soil survey. Surface visibility ranged from 100 percent along the shoreline to less than five percent further inland.

One thermally altered bifacial blank, five small flakes, two pieces of shatter and a piece of burnt clay were recovered from the shoreline. An extensive shovel cut testing program was conducted inland from the observed shoreline artifacts. A total of 50 shovel cuts were excavated at a 10 m grid interval. No cultural materials were recovered from the shovel cuts.

140S122 represents a small, limited-use site. The cultural affiliation of this site cannot be determined from the data recovered. Based on the lack of content and subsurface integrity, 140S122 is not recommended to be eligible for the National Register.

## 140S123

140S123 consists of a moderately dense scatter of historic debris extending over an area of approximately 3600 sq m located during the survey of the Sun Dance Recreation Area (Figure 27). The site is situated on a gentle upland slope, mapped as the Dennis soil series, 30 m north of an intermittent stream. The site was located in a freshly plowed field with a surface visibility of 100 percent.

An extensive scatter of brick, glass, crockery and earthenware were observed in the field. Many of the bricks were broken and widely dispersed, probably as a result of tillage. No intact foundations were located. Seven artifacts were recovered during the general surface collection. This material includes three pieces of glass, two pieces of common white ware, one piece of crockery and a brick fragment. Two of the glass artifacts are fragments of different bottles and the third specimen was melted and unidentifiable. The white ware consists of the fragments of one cup and one plate. A rim sherd from a large crockery mixing bowl and a brick fragment constitute the balance of the assemblage.

The scatter of bricks and associated domestic artifacts indicate that 140S123 is the remains of an historic domicile. The style of the artifacts suggests that the site dates to the late nineteenth or early twentieth century. The melted glass indicates that the structure may have burned. A search of historic documents was made in an attempt to identify the structure. Local, county and state records were reviewed, including Government Land Office records, various county atlases, plat books and local histories. The review of historic documents determined that 140S123 is located in the vicinity of lots 33 and 34 of the town of Arvonia. This community was platted by a company of Welsh people led by J. Mather Jones in 1867. Other prominent men of the town included J. A. Whitaker, John Rees, John Nei Jones, L. Humphrey, Evan Evans, David Lloyd Davis and the Rev. J. M. Barrows. The post office for Arvonia was established in 1873.

For a short time this Welsh community prospered with merchants opening stores and the construction of a school. North of the town near the Marais des Cygnes River, a steam-powered sawmill was built. Several cheese factories were also started in the vicinity of Arvonia. Three churches were founded in Arvonia. These were the Welsh Congregational, Welsh Methodist and a Congregational Church formed of other nationalities. None of these Arvonia churches are active today. The community founders had expected a railroad to be built along the Marais des Cygnes River valley. When the expected railroad failed, many of the townspeople became discouraged and relocated. The Arvonia post office was closed in 1901 (Copple 1970).

140S123 probably represents the remains of one of the early Welsh colonist's houses in Arvonia. The identity of the house owner could not be established. Since 140S123 was determined to be the remains of a historic domicile within the town limits of Arvonia the site was considered potentially significant. Based on this determination the site was revisited in June of 1983. At this time, the site was situated in a fallow field with a ground surface visiblity ranging from 20 to 30 percent. The brick and historic artifact concentration was relocated. None of the brick fragments was larger 15 cm, with most specimens being in the 5 to 10 cm size range. Two transects of shovel cuts were excavated across the debris scatter with each transect consisting of six shovel cuts located at 10 m intervals. All but three shovel cuts encountered historic artifacts consisting of ceramics, glass or brick. This material was located within the plowzone and no intact foundations were located. The shovel cuts were excavated to determine the depth of

the deposits and to locate subsurface foundations, but not to recover additional artifacts. Therefore all artifacts encountered in the shovel cuts were returned with the backfill.

The additional investigations conducted at 14OS123 confirmed the survey data, which had indicated that the site was heavily disturbed by agricultural tillage. Due to the location of this debris within the plowzone and the lack of structural integrity, the investigators do not recommend 14OS123 to be eligible for the National Register.

## 14OS124

This site consists of a moderately dense scatter of glass, china and crockery observed along a 30 m stretch of shoreline on the north side of Melvern Lake (Figure 27). A large concentration of uncut limestone cobbles was located approximately 10 m inland of the shoreline debris scatter. The site is situated on upland soils mapped as the Summit series approximately 900 m north of the Marais des Cygnes River. Surface visibility ranged from 100 percent along the shoreline to less than ten percent further inland.

A total of 19 artifacts were recovered from the shoreline. This material consists of eight pieces of glass, six pieces of crockery and five pieces of white ware. The glass artifacts include three pieces of clear bottle glass, three pieces of light green bottle glass, one piece of melted blue glass and one fragment of a white glass lid. The six pieces of crockery are all small body sherds from at least four vessels. The white ware consists of three plate fragments and two cup fragments. The concentration of uncut limestone may be part of a destroyed building foundation. This debris was entirely covered with thorny vegetation which obscured its exact shape. These are common artifacts dating to the late nineteenth through the mid-twentieth century. No structures were recorded at this locale on U. S. Army Corps of Engineers project maps, which indicates that the structure which stood in this area was destroyed prior to 1962.

A review of local histories, state and county records, historical atlases, plat books and Government Land Office records was made to identify the site. The historic documents review resulted in the determination that 14OS124 is located within the city limits of Old Olivet. The town of Olivet was platted in 1869. The town site was located by the Rev. A. J. Bartlets, minister of the New Church Swedenbargians, along with J. R. Elder and C. P. Loracke. These men represented a company of investors who had raised 10,000 dollars to found a new town in Kansas. The city planners for Olivet had ambitions of forming a large, vigorous city. One third of the town's property was reserved as a dower for a college. The remainder of the lots were put up for public sale. In 1869 Olivet was incorporated as a third class city. Besides the three founding fathers, other early prominent citizens of Olivet included Frank Hinkman, James Dickerson, Dr. Power P. Hesler and H. J. Davis. Early enterprises at Olivet included a general

store, a drug store, a hotel, sawmill, and wagon and blacksmith shops. The city planned on constructing a flour mill and issued 3000 dollars for its construction, though this enterprise was completed by private concerns. The Olivet post office was opened in 1870. In 1873 tragedy struck this fledgling community in the form of a large fire, which swept through the town destroying two unoccupied buildings, stables and stores of produce. This fire apparently discouraged many of the townsmen who moved to other locations. The Olivet post office closed in 1888 when the community relocated to New Olivet, formally Ridgeton and Penfield. New Olivet was situated around the Kansas City and Southwestern Railroad (Copple 1970).

140S124 is located near the south end of block numbers 40 and 42 as listed in the 1879 Atlas of Osage County. The 1879 atlas illustrates most of the blocks within Old Olivet in a shaded manner. Blocks 8, 9, 24, 25, 40, 47 and 56 are not shaded, which probably indicates that these blocks were not occupied in 1879. The 1899 Atlas of Osage County illustrates all of the blocks in Old Olivet without shading, which probably indicates the town's abandonment. These data indicate that 140S124 may represent a farmstead built between 1879 and 1899 instead of being a housesite related to Old Olivet. The 1918 atlas lists the property where 140S124 is located as belonging to Chase Crawford, although no buildings are illustrated at this location. This suggests that the structure which 140S124 represents was probably destroyed by this date.

Since 140S124 is located on the northern edge of Old Olivet, the site was considered potentially significant in the local history of the area. Based on this consideration, the site was revisited in June of 1983. The concentration of foundation stones was relocated and carefully inspected. They measure approximately 17 m long by 13 m wide. Inspection of these stones indicated that some were cut and shaped into rectangular blocks, though most of this debris appeared to be unmodified. Although the shape of the foundation stone cluster is roughly rectangular, inspection of the debris failed to identify any walls. Futhermore, the foundation stones are haphazardly piled. The removal of a couple of stones demonstrated that most of them are lying on the ground surface. A broken well top, constructed of brick and mortar, was located on the extreme eastern end of the foundation stone concentration. This circular brick and mortar construction is broken in half and is not in context. Broken brick fragments are visible for distances of up to 60 m to the west and east of the limestone foundation stone concentration.

One foundation which was not located during the 1982 survey was found 30 m northeast of the limestone rubble during the 1983 inspection. This foundation is clearly recent in nature and consists of a narrow formed concrete foundation 7.8 m in length and 3.1 m in width. The foundation is divided into two rooms by a north to south running poured concrete divider. This foundation probably represents an agricultural outbuilding or shed of recent origin.

In summary, the June of 1983 inspection of 140S124 determined that the limestone concentration observed during the shoreline survey is not

an intact foundation. Rather it probably represents a field dump of uncut foundation blocks. The blocks were most likely piled at this location during agricultural field clearing operations, although the location of the original foundation site was probably nearby. The poured concrete foundation, which was located when 140S124 was revisited, is a relatively recent agricultural outbuilding or shed. The relationship of this outbuilding to the now destroyed house foundations cannot be determined from these data. Based on its disturbed nature and the lack of structurally intact remains, 140S124 is not recommended to be eligible for the National Register.

## 140S125

This site is a large, thin scatter of historic debris located along the shoreline on the north side of Melvern Lake (Figure 27). The site is situated on a south facing upland slope mapped as the Clareson-Eram soil complex approximately 820 m north of the confluence of an intermittent stream with the Marais des Cygnes River. Surface visibility ranged from 100 percent along the shoreline to approximately 30 percent further inland.

A total of 17 artifacts were recovered from 140S125. This material includes eight pieces of glass, four pieces of crockery and five pieces of white ware. The glass artifacts are all fragments of bottles or vases ranging from clear, light purple to brown in color. One piece of glass has been melted. These fragments represent at least five different vessels. The pieces of crockery consist of two base fragments and two body sherds representing four separate vessels. The white ware artifacts include two rim sherds from different cups or vases and three base fragments from different plates. These artifacts are common late nineteenth to mid-twentieth century materials.

A search of local, county and state records was made to identify this site. This search included a review of county atlases, histories, plat books and Government Land Office records. The historic documents search indicates that 140S125, like 140S124, is located within the city limits of Old Olivet. According to the 1879 plat of Olivet, 140S125 is located at the north end of Second Street in the vicinity of Blocks 8 and 9. While most of the blocks located north of the river are shaded, Blocks 8, 9, 24, 25, 40, 47, and 56 are left unshaded, possibly indicating that the blocks were vacant in 1879. The 1899 atlas exhibits the same data as the 1879 Olivet plat, except that none of the blocks are shaded, probably indicating the abandonment of the townsite. The 1918 Atlas of Osage County does not illustrate the town of Old Olivet at all. This atlas shows a structure at the location of 140S125 which is listed as belonging to C. T. Freeman. The U. S. Army Corps of Engineers project contour maps and the 1963 USGS 7.5 minute Lyndon Quadrangle do not show any structures at this location, indicating the destruction of the Freeman structure prior to the early 1960's.

Since 140S125 was a possible, though unlikely, part of Old Olivet, the site was revisited in June of 1983. A o0 by 60 m light to moderate density historic artifact scatter composed of brick fragments, metal fragments, ceramics and glass was observed. No intact or even partial foundations were located. Most of the debris was located along and up to 10 m inland of the shoreline on a deflated surface. No additional artifact collections were made.

In summary, 140S125 is located within the city limits of Old Olivet. However, the 1879 plat of Old Olivet indicates that the blocks in the vicinity of the site were vacant at that time. Based on the 1918 atlas, 140S125 is probably the Freeman farmstead, which was built between 1899 and 1918. It was destroyed, possibly by fire, sometime prior to 1963. Based on the relatively recent nature of this site, the lack of structural integrity and the disturbed context of the artifact scatter, 140S125 is not recommended to be eligible for the National Register.

## 140S126

140S126 is a small historic site situated on upland soils mapped as the Clareson-Eram complex approximately one km north of the confluence of an intermittent stream with the Marais des Cygnes River (Figure 27). At the time the site was located, it was situated in a fallow field covered with scrub willow and thorn trees. The surface visibility ranged from 40 to 60 percent. The site consists of a single tier of foundation stones measuring six by eight m. The rusted remains of a woodstove were found within the interior of the foundation stones. The round nail recovered from the site is also indicative of a fairly recent age for the site.

A search of local, county and state records including plat books, historical atlases, histories and Government Land Office records was made to identify this site. The review of historic documents indicates that 140S126 is located just north of the city limits of Old Olivet. The 1879 Atlas of Osage County lists the property as belonging to someone with the initials RST. No buildings were shown for this locale. The 1899 atlas lists this property as belonging to J. Vanorman, and again no structures are shown at this location. The 1918 atlas lists the property as belonging to Mary Tyson and shows one house in the vicinity of 140S126. This structure appears to be somewhat north of 140S126. Furthermore, the observed remains at 140S126 are too small and lack sufficient domestic artifacts to be the remains of a farmstead. The Tyson farmstead is not shown on the USGS 7.5 minute Lyndon Quadrangle nor on the U. S. Army Corps of Engineers project maps indicating that this farmstead was destroyed prior to 1963.

Due to the location of 140S126 in the vicinity of Old Olivet, the site was reinspected in June of 1983 at which time two additional foundations were located. One of these foundations consists of a single

tier of uncut irregular limestone blocks located 5 m south of the foundation identified during the shoreline survey. This foundation is 5 m wide and 8 m long. This foundation is subdivided by interior foundation walls into four distinct rooms. Two of the rooms on the north side of the structure are 1 m wide, while both of the southern rooms are approximately 2.5 m wide. Some fused glass was observed within these small rooms but little other debris besides the foundations was noted. This strucure probably represents a stall. The second foundation located during the 1983 reinspection consists of an ovate depression 8.5 by 7.5 m in dimension. This depression is approximately 1.5 m deep and has poured concrete blocks containing rebar with brick fragments as well as historic ceramics and glass in the surrounding area. This depression is probably a partially filled-in basement. This structure is located approximately 20 m east of the stall and may be related to the Tyson house. Most of the brick and concrete around this depression is in fragmentary condition.

In summary, 140S126 consists of the partial remains of three foundations and associated artifacts. Two of these foundations, based on size, formal characteristics and limited artifact content appear to be agricultural outbuildings. The third probable foundation consists of an ovate depression, located 20 m east of the outbuildings. This depression may represent the basement of root cellar, possibly associated with the Tyson farmstead. The fragmented condition of the bricks and concrete around this structure evidence its very disturbed condition. The probable house basement and associated outbuildings are apparently associated with the Tyson farmstead. These structures were built between 1899 and 1918. The farmstead was destroyed, possibly by fire, prior to 1963. Though the outbuilding foundations are relatively complete, they are unlikely to produce historically significant data, due to their highly disturbed condition. Based on the relatively recent nature of this historic site and its disturbed condition, it is not recommended to be eligible for the National Register.

## MAX MORTON SITE (140S127)

140S127 is a historic site consisting of the ruins of a large two story structure and associated outbuildings from the Max Morton farmstead. The site is on a south facing bluff slope overlooking the former channel of the Marais des Cygnes River (Figure 41). The site is on upland Clareson-Eram soils approximately 1100 m north of the Marais des Cygnes and 90 m west of an intermittent stream. When 140S127 was located, the site was situated in heavy brush and woods. Scatters of historic artifacts were observed in and around the large structure.

The ruins of the Max Morton farmstead consist of the remains of a large two story masonry farmhouse with a semi-basement and porch and three attached storage rooms (Structures A-E). The remains of a large, two story barn (Structure F) associated with the Morton house complex is located 25 m north of the northern-most storage room (Figure 41). The

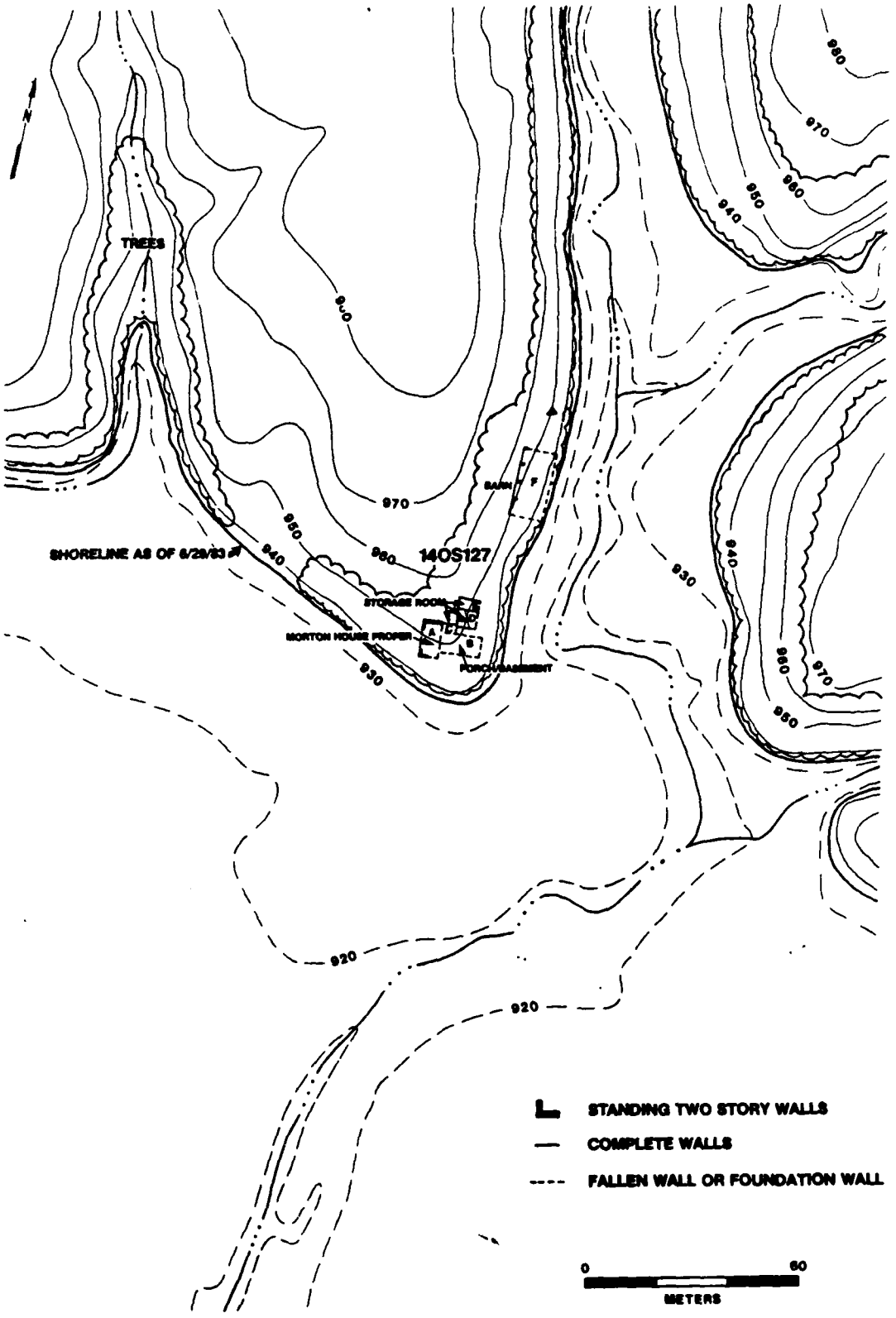



Figure 41. Location of structures at 140S127.



Figure 42. Views of architectural remains at 140S127. General view of the south of Structure A (upper) and Structure D (lower).

exterior walls of the house proper (Structure A) measure 10.5 m north to south and 5.5 m east to west. The north wall and southwest corner of the south wall remain standing (Figure 42). Measured from the interior of the structure the first floor floor joists are located 1.8 m above the ground while the walls themselves measure 4.8 m from interior ground surface to the wall tops. A large portion of the western wall has collapsed to the west, while all of the eastern wall and 50 percent of the southern wall have also collapsed. The remains of a semi-basement and porch (Structure B), which is 5.6 m wide, extend from the center of the eastern wall east for a distance of 11.5 m (Figure 41).

The complex of three attached storage rooms (Structures C-E) is located along the northeastern corner of the house proper (Figure 42). Structure C is a small 2.7 by 4 m room probably utilized for wood storage. This structure has completely collapsed. Structure D measures 5.3 by 5.7 m and is the only structure at the Max Morton site which retains part of its roof. The roof consists of a barrel vault which is labor intensive in construction and is rather rare in domestic architecture (Figure 42). This roof has a crack running east to west through the center of it and continuing down the west interior wall of the structure. This crack indicates that the remainder of the roof is in imminent danger of collapse. A doorway is located in the center of the room on its eastern wall. This structure functioned as a storage room for dairy products or ice. Structure E is attached to the north wall of Structure D and is 3 m wide and 6 m long. The roof and eastern wall of this room have both completely collapsed. This room also functioned for the storage of either ice or dairy products (Kuykendall 1979).

The last structure identified and mapped at the Max Morton site is Structure F (Figure 43). This structure consists of the remains of a two story masonry barn which is 19.7 m long by 9.7 m wide. The west wall is of limestone construction and exhibits four buttresses which divide the barn into four large stalls (Figure 43). The west wall is approximately 3.5 m high. Buttresses are labor intensive constructions and are also rather rare in domestic architecture. The northern, southern, and eastern walls consist of narrow, poured concrete foundations. A doorway to the barn is located at the northeast corner of the building and two poured concrete post supports were identified in the interior of this structure. The eastern wall of the barn is situated within one m of the shoreline at an elevation near 1034 ft above msl. Waves break on this foundation and when flood pool levels are reached the lake actually washes on the western wall and buttresses, causing significant damage to the western wall (Figure 43).

A history of the Morton family and house has already been prepared by Kuykendall (1979). At the age of 18, Max Morton fled his home and family in southern Germany to Canada to escape a life in the ministry which his family had planned for him. From Canada he moved to Ohio and then to Kalamazoo, Michigan where he worked as a farmer and a cooper. He was married in Kalamazoo on August 14, 1862. During the Civil War, he enlisted in Company D of the Seventeenth Michigan Infantry on August 4th, 1862 and was wounded during the battle of Antietam on September 17,

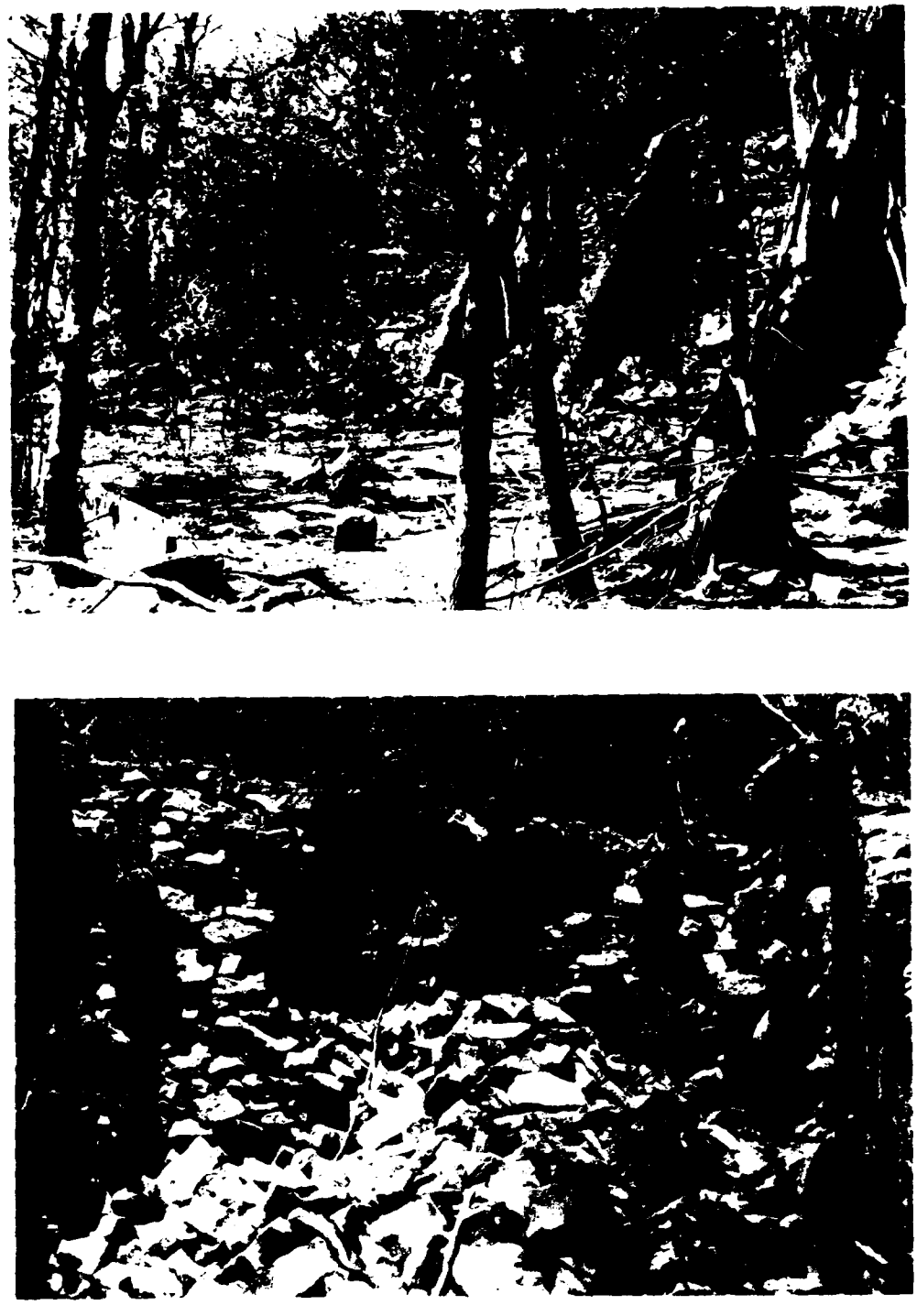


Figure 43. General views of the barn at 140S127. View to the southwest showing western wall buttresses and eastern wall foundation (upper). View to the west of the barn wall showing impact of lake erosion (lower).

1862. Morton was mustered out of the army as a result of his leg wound, but during his short period of enlistment he was involved in some of the bloodiest battles of the Civil War.

In 1870 Max Morton and his wife moved to Osage City, Kansas where Max worked on a cheese farm and as a laborer on other nearby farms. In 1872 the Mortons purchased the land for the price of eight dollars an acre. That year they lived on a nearby farm while they built the two story stone house. The Mortons moved into their new house in 1873 where they resided and raised their family. Max Morton lived in the old stone house until his death in 1907. By that time, he had established himself as a prominent citizen of Osage County and his farm had grown to over 1000 ac. His house and hospitality were well known in the community. Transient Sac Indians would stop by for food. By this time Max was employing farm labor instead of working as a laborer. After 50 years of continuous occupancy by the Morton family, the Morton house was gutted by fire in the 1920s. His wife, Francis Morton, died in 1931.

## Discussion and Recommendations

140S127, the Max Morton Site, consists of the ruins of a large two story cutstone house and associated outbuildings. The structures were built in 1872 and occupied in 1873. The house was gutted by fire 50 years later. The remains of five structures at the Max Morton site include the stone house and attached porch/basement, three attached storage rooms and the barn. The standing walls and barrel vault of one of the storage rooms are well preserved although the roof of storage room D is cracked and in danger of collapse. The western wall of the barn is being eroded by wave action during high water levels.

While the Max Morton site has some historical and architectural significance, it does not appear to be sufficiently well preserved to be eligible for the National Register. These ruins serve as a local monument to the industry and success of an early Kansas pioneer family. The ruins themselves exhibit some important architectural details of nineteenth century masonary construction techniques. Of particular interest are the barrel vault type construction of storage room D and the buttresses utilized in the construction of the barn. The Max Morton site is not recommended to be eligible for the National Register.

## 140S128

This site consists of the remains of an uncut limestone cabin located on the north side of an upland bluff mapped as Clareson-Eram soils approximately 150 m south of an intermittent stream which flows into the Marais des Cygnes River (Figure 27). The site is located in a wooded area with a surface visibility ranging from five to ten percent. No other historic artifacts were located.

The structure's roof has collapsed or burned and three out of the four walls have collapsed into the interior. The west wall is nearly complete and is approximately two m high. This wall has a small rectangular window and a doorway. The remaining three walls have collapsed to a height of one m or less. The workmanship evident in the construction of this cabin is very good.

A search of local, county and state records was made to identify this building and determine its history. Government Land Office records, plat books, historical atlases and local histories were reviewed. These documents failed to locate any structure at the location of 140S128. The property in question was patented on Dec. 2, 1865 and purchased by J. W. McManus. In 1867, McManus sold the property to Seyferl McManus & Co., who in 1869 sold the tract to Jones and Whitaker. W. M. A. Jones purchased the property in 1870 and in 1878 he sold the tract to H. Lewis. Lewis was in possession of this land when the 1879 Atlas of Osage County was compiled. The atlas shows his house located approximately 400 m southwest of 140S128. Since 140S128 appears to be a cabin and not an agricultural outbuilding, it would seem unlikely that this site is related to the Lewis house site. This property changed hands three more times between 1884 and 1896 when Ann Jones assumed possession. Both the 1899 and 1918 atlases list Ann Jones as the owner. The Lewis house was apparently destroyed between 1879 and 1899 since it does not appear on the 1899 atlas. Neither the USGS 7.5 minute Lebo Quadrangle nor the U. S. Army Corps of Engineers project maps list any structures in this area. The property was owned by David W. Evans when purchased by the U. S. Army Corps of Engineers.

The exact function or date of construction of the cabin designated 140S128 could not be determined from the available data. In 1858 the U. S. Government built at least 164 houses for the Sac and Fox Indians, at their expense and against their will. This attempt at forced acculturation generally failed with the Indians preferring to use the buildings as stables. It is entirely possible that 140S128 is one of these structures. If this is the case, then this site could provide extremely important data on the extent of the acculturation of the Sak and Fox in the late 1850s. Further investigations are necessary to confirm the identity of this site.

In summary, 140S128 consists of the ruins of an uncut local stone cabin. The site is located outside of the survey zone and there is insufficient data available to determine this site's potential for the National Register. Nevertheless, the ruins are in a good state of preservation and the site may be significant.

## 140S352

140S352 is located in a lowland setting approximately 100 m southwest of the confluence of Standifred Creek with the Marais des Cygnes River (Figure 44). 140S352 is a previously recorded site

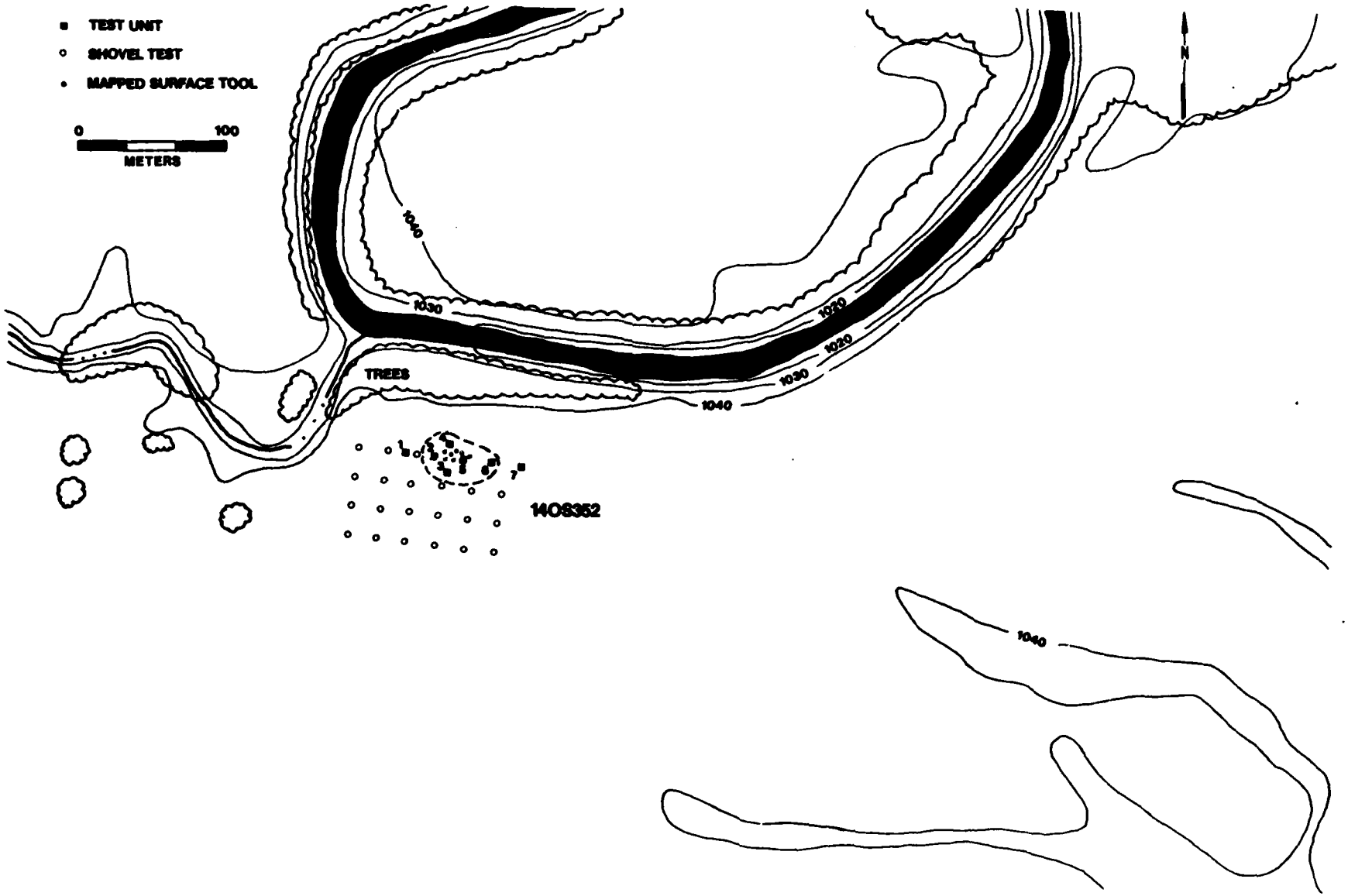



Figure 44. Location and plan view of test excavations at 140S352.

reported to the Kansas State Historical Society by Traub in 1975. She reported the site to be of unknown cultural affiliation and to cover an estimated 10,000 sq m area. She observed daub, collected two thumbnail scrapers and recommended that the site be tested. When investigated, 140S352 was situated in a fallow field covered with weeds two m high. The excavation of 20 shovel cuts at 20 m intervals failed to recover any cultural materials at this location. A small light lithic scatter was located at the edge of a plowed field approximately 75 m west and 60 m north of the reported location of 140S352. This lithic scatter extends over 1244 sq m and is probably 140S352 or a sub-area of that site.

Mapping of all surface artifacts delineated a site covering an area of 65 by 35 m. To determine if the site extended into grassy and weed covered areas to the west and south of the site, shovel cuts were placed at 20 m intervals over the site. A total of 21 shovel cuts were excavated with negative results. A total of seven one m test units were located at 20 m intervals so as to crosscut the more concentrated surface deposits. Small amounts of cultural material were recovered from the upper 40 cm of Test Units 2, 3, 4, 5 and 6. Two flakes were recovered from Test Unit 6 at 55 cm below surface.

## Soil Stratigraphy

140S352 is situated on the terraces of Standifred Creek and the Marais des Cygnes River. The site is located on soils mapped by the Osage County soil survey as the Osage series. The profiles for Test Unit 4 and Test Unit 6 are presented below.

Test Unit 4:

| | | |
|---|---|---|
| 1A1p | 0-15 cm | Very dark grayish brown (10YR3/2) silty clay; granular structure. |
| B2t | 15-34 cm | Very dark grayish brown (10YR3/2) strong moderate subangular blocky structure. |
| C1 | 34-50+cm | Dark yellowish brown (10YR4/4). Silty clay; weak subangular blocky structure grading to massive structure. |

Test Unit 6:

| | | |
|---|---|---|
| Ap | 0-16 cm | Very dark grayish brown (10YR3/2) silty clay; granular structure. |
| A | 15-28 cm | Very dark gray (10YR3/1) silty clay; weak fine subangular blocky structure. |
| Bg2 | 35-70+cm | Brown (10YR4/3) silty clay; massive to very weak fine subangular blocky structure. |

Cultural materials were recovered from the Ap and upper B2t horizons in Test Unit 4 and the Bg1 and Bg2 horizons in Test Unit 6.

## Artifact Assemblage

Artifacts recovered from 140S352 include 12 chipped stone tools, 94 pieces of lithic manufacturing debris, six burnt rocks and two unworked stones. The distribution of this debris by class is presented in Table 28.

The 12 chipped stone tools were recovered from the surface. These implements include one drill, two biface fragments, two scrapers and seven edge-modified flakes. The drill is a small midsection of a narrow biface which exhibits parallel lateral edges and a biconvex cross-section. The biface fragments are sections of projectile points, bifacial knives or blanks. The scrapers include one large, unifacial end scraper and one marginally retouched flake scraper. The flake scraper exhibits unidirectional, steep angle retouch on one lateral edge and bidirectional retouch with attritional wear on the opposite lateral edge, indicating additional usage as a flake knife. The seven edge-modified flakes were used in light cutting and scraping tasks. Approximately 42 percent of the chipped stone tools have been thermally altered.

The 94 pieces of lithic manufacturing debris include three chunks, 54 flakes and 37 pieces of shatter. All three chunks have been heated. Most of the 54 flakes are intermediate or small secondary elements. No bifacial thinning flakes were recovered. Approximately 35 percent of the flakes retain cortex on some portion of their surface and 46 percent exhibit traits associated with thermal alteration. The remainder of the chipped stone artifacts consist of six burnt rocks and two unworked stones.

## Discussion and Recommendations

The investigations indicate that 140S352 consists of a small site extending to a depth of 40 cm below surface, although two artifacts were recovered at a depth of 55 cm. The artifact assemblage indicates that activities associated with hide preparation and various light-duty cutting and scraping tasks were conducted at the site. The biface fragments and small amounts of debitage indicate that a limited number of chipped stone tools were manufactured and modified on the site. No ground stone or chipped stone tools associated with plant food procurement or preparation were recovered. No middens, features or concentrations of artifacts were located during the testing. These data indicate that 140S352 represents a small hunting camp. The cultural affiliation of this campsite cannot be determined from the data recovered.

Based on its unknown cultural affiliation and limited content, it

Table 28. Artifact assemblage from 140S352.

| | Test Units | | | | | Surface | TOTAL |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | | |
| CHIPPED STONE TOOLS | | | | | | | |
| Drill | | | | | | 1 | 1 |
| Biface Fragments | | | | | | 2 | 2 |
| Scrapers | | | | | | 2 | 2 |
| Edge-Modified Flakes | | | | | | 7 | 7 |
| Total | | | | | | 12 | 12 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | |
| Chunks | | 1 | 1 | | | 1 | 3 |
| Flakes | 3 | 4 | 2 | 3 | 1 | 41 | 54 |
| Shatter | 2 | 2 | | 4 | 1 | 28 | 37 |
| Total | 5 | 7 | 3 | 7 | 2 | 70 | 94 |
| BURNT ROCK | | 2 | 1 | | | 3 | 6 |
| UNWORKED STONE | | | | | 1 | 1 | 2 |
| TOTAL | 5 | 9 | 4 | 7 | 3 | 86 | 114 |

is unlikely that 140S352 will contribute significant data to the prehistory of the region. The site is not recommended to be eligible for the National Register.

## 140S362

140S362 is a previously recorded site listed in the Kansas State Historical Society site files as a Plains Woodland occupation. When investigated in August of 1982, 140S362 was situated on a north-facing bluff overlooking the Marais des Cygnes River (Figure 45). The bluff is bounded on the west and north by steep drop-offs to the Marais des Cygnes River below. To the east, a more gentle slope falls off towards an intermittent tributary. A broad floodplain is located below the bluff on the northeast. The 1982 reconnaissance indicated that 140S362

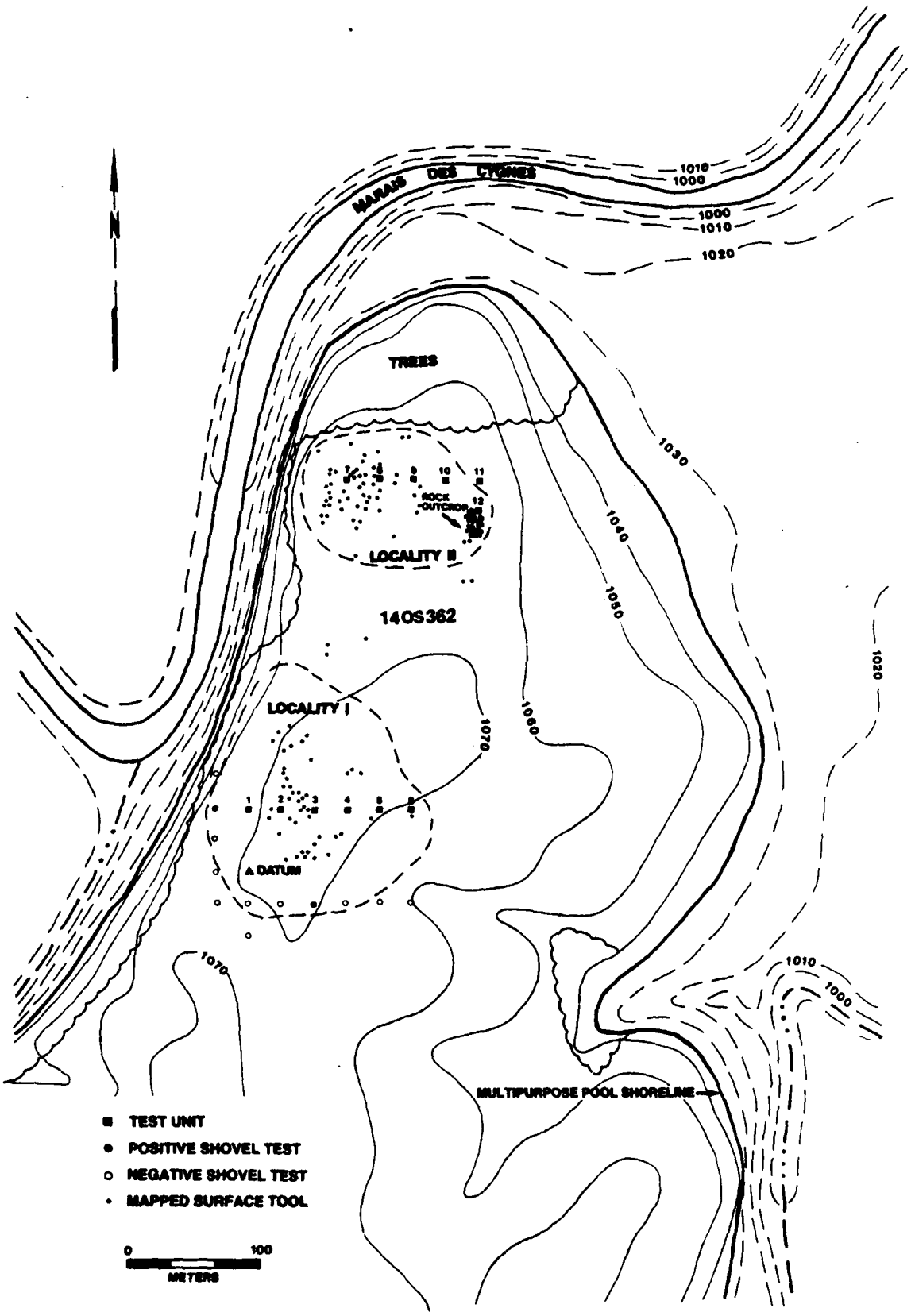



Figure 45. Plan view of the excavations at 140S362.

had two distinct scatters containing moderate densities of lithic debris. The two localities are separated by an eroded gully containing a light discontinuous lithic scatter. The northern locality was estimated to cover an area of 7500 sq m and the southern locality 18,200 sq m. Based on the reported cultural affiliation of the site and on the recovery of a corner-notched expanding stemmed dart point, the site was interpreted as a Plains Woodland occupation. Since 140S362 was located outside of the 1982 survey zone no evaluative investigations were conducted in 1982. The 1983 draft report on the work at Melvern recommended testing at 140S362 (Schmits 1983).

The 1984 modification to contract DACW 1-81-C-0149 required testing of 140S362. The 1984 test investigations commenced with the establishment of a site datum. Mapping of all surface artifacts resulted in the delineation of the two localities observed during the 1982 reconnaissance. Surface visibility was excellent as the site had recently been planted in beans and had been rained on. The southern artifact scatter was designated Locality I and the northern artifact scatter Locality II (Figure 46). An intensive surface collection was conducted at each locality. Locality I was determined to consist of a lithic scatter 190 m long by 170 m wide with a centrally located chipped stone tool concentration 110 m long by 90 m wide. The Locality II debris scatter extended over an area 100 m long by 145 m wide with a centrally located chipped stone tool concentration 70 m long by 75 m wide. Locality I extends over 41,104 sq m, while Locality II extends over 12,892 sq m. Transects consisting of six one by one m test units were located at 25 m intervals at each locality. Transects were oriented west to east in order to cross-cut the center of the defined localities (Figure 45). The excavations indicated that cultural materials were present only in the upper 20 cm of soil and primarily in the upper 5 to 10 cm of the cultivation zone. Limited amounts of cultural material were recovered from Test Units 1, 2, 3, 4, 5, 7, 8, and 9. Two transects of shovel tests were excavated on the south and west sides of Locality I for purposes of site delineation. Shovel Tests 4 and 11 were positive.

## Soil Stratigraphy

Based on the preliminary Osage County Soil Survey and on-site inspection, Locality I of 140S362 was determined to be situated on soils belonging to the Eram series. These soils are formed from weathered shale on slopes varying from 3 to 12 percent. Locality II, however, is situated on the Clareson-Eram soil complex. The Clareson-Eram complex is composed of soils formed from weathered limestone on slopes ranging from 3 to 15 percent. The profile descriptions of Test Units 4 and 7, representative of the Eram and Clareson-Eram soils respectively, are presented below.

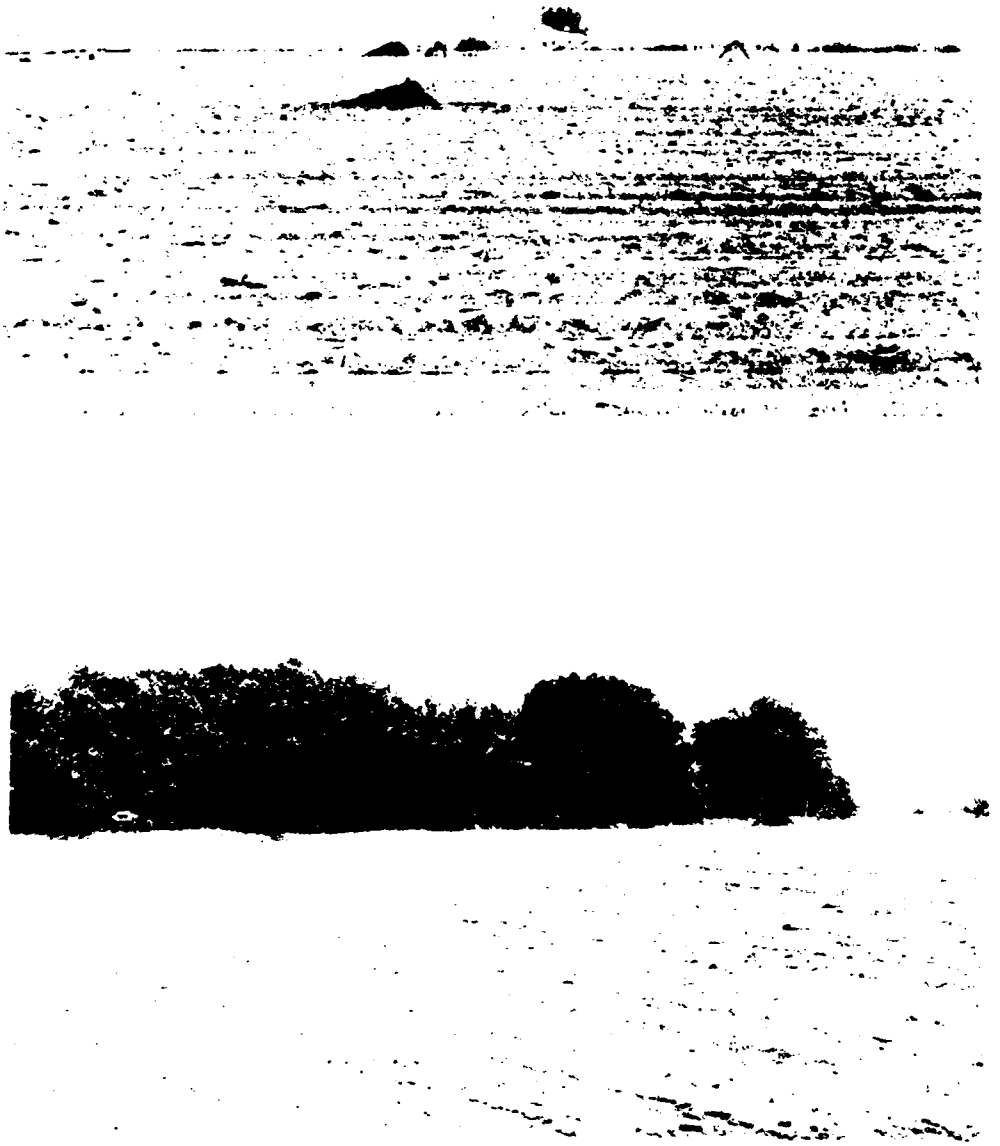


Figure 46. Test excavations in progress at 140S362: test excavations at Locality I (upper). Test excavations at Locality II (lower).

Test Unit 4:

| | | |
|---|---|---|
| Ap | 0-10 cm | Dark brown (10YR3/3) silty clay loam; moderate medium and fine granular structure; hard, firm; clear smooth boundary. |
| B21t | 10-34 cm | Very dark grayish brown (10YR3/2) silty clay, moderate medium and fine subangular blocky structure, very hard, very firm; thin films on ped surfaces, gradual smooth boundary. |
| B22t | 34-50+cm | Brown (10YR4/3) silty clay; common faint olive brown (2.5YR4/4) mottles; moderate medium blocky structure, very hard, very firm; thin films on ped surfaces. |

Test Unit 7:

| | | |
|---|---|---|
| Ap | 0-5 cm | Dark brown (10YR3/3) silty clay loam; dry; moderate medium granular structure; slightly hard, firm; gradual smooth boundary. |
| B21t | 5-15 cm | Dark brown (7.5YR3/2) silty clay loam; strong medium granular structure; hard, firm; gradual wavy boundary. |
| B2t | 15-20+cm | Dark reddish brown (5YR3/3) flaggy silty clay loam; moderate fine and medium blocky structure; very hard, common flaggy limestone fragments. |

The profile descriptions of these units are representative of the profile descriptions for other test units excavated in the respective localities. Only minor variation in depth of the soil horizons occurred. A comparison of the profile descriptions documents the loss of almost all of the A horizon for both localities and a further loss of some 14 cm of B21t horizon at Locality II. Locality II is situated on a steeper slope than Locality I and the increased gradient probably facilitated a higher degree of erosional impact, particularly after cultivation. No cultural materials were recovered from below the Ap

horizon in any of the test units excavated at 140S362. The cultural materials are clearly associated with the A horizon and consequently have been mixed due to frequent tillage.

## Artifact Assemblage

A total of 2288 artifacts were recovered as a result of the investigations conducted at 140S362 (Table 29). Of this total, 1457 were recovered from Locality I and 831 from Locality II. The assemblage includes 161 chipped stone tools, two ground stone tools, 2085 pieces of lithic manufacturing debris and minerals, one unworked bone, one shell and 36 pieces of unworked stone.

Seventy-six of the 161 tools were recovered from Locality I and 85 from Locality II. The chipped stone implements include 29 projectile points, one drill, seven bifacial knives, 29 bifacial blanks, 55 biface fragments, 12 scrapers, two perforators and 26 pieces of edge-modified debitage. All of the chipped stone tools except for one bifacial knife recovered from the upper 10 cm of Test Unit 9 were surface finds. The chipped stone tool assemblage is typified by the fragmentary condition of the implements. Only five projectile points and one biface are complete. Nearly all are extensively worn or reworked. Approximately 43 percent of the chipped stone tool assemblage from the site appear to have been thermally altered.

The 29 projectile points include ten specimens from Locality I and 19 from Locality II. The assemblage is made up entirely of dart points with the exception of one arrow point. Corner-notched forms predominate, followed by lanceolate and stemmed forms. Of the ten points from Locality I, only three are sufficiently complete for classification. The first specimen is a medium-sized corner notched dart point with a short broad triangular blade (Figure 47a). This specimen has broad deep corner notches forming an expanding stem and a convex base. The second nearly complete specimen is a medium-sized corner-notched dart point with an expanding stem (Figure 47b). The point has a triangular blade, a lenticular cross-section and a slightly concave base. The third specimen consists of a small corner-notched or stemmed dart point which exhibits transverse fractures across the base and blade (Figure 47c). The stem appears to be straight to slightly expanding. It was manufactured from a subtriangular preform with a lenticular cross-section. The remaining projectile points from Locality I consist of one lateral fragment of a corner-notched point and the bases of six expanding stemmed points. Three of these have convex and three have straight bases. Four of the ten points from Locality I appear to have been heated. Two specimens were manufactured from a non-local white chert, while the remaining specimens were manufactured from local gray and pinkish gray fossiliferous cherts.

The projectile points recovered from Locality II are more numerous and morphologically more heterogeneous than the assemblage from Locality I. Lanceolate, stemmed and corner-notched points are represented (Figure 47d-o). Lanceolate points include three specimens, only one of

Table 29. Artifact assemblage from 140S362.

| | LOCALITY I | | | | LOCALITY II | | | SITE |
|---|---|---|---|---|---|---|---|---|
| | Test Units | Shovel Tests | Surface | Total | Test Units | Surface | Total | TOTAL |
| CHIPPED STONE TOOLS | | | | | | | | |
| Projectile Points | | | 10 | 10 | | 19 | 19 | 29 |
| Bifacial Drill | | | | | | 1 | 1 | 1 |
| Bifacial Knives | | | | | 1 | 6 | 7 | 7 |
| Bifacial Blanks | | | 10 | 10 | | 19 | 19 | 29 |
| Biface Fragments | | | 31 | 31 | | 24 | 24 | 55 |
| Scrapers | | | 6 | 6 | | 6 | 6 | 12 |
| Perforators | | | 2 | 2 | | | | 2 |
| Edge-Modified Chunks | | | | | | 1 | 1 | 1 |
| Edge-Modified Flakes | | | 17 | 17 | | 8 | 8 | 25 |
| Total | | | 76 | 76 | 1 | 84 | 85 | 161 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | |
| Cores | | | 9 | 9 | | 6 | 6 | 15 |
| Chunks | 1 | | 43 | 44 | | 5 | 5 | 49 |
| Flakes | 10 | 1 | 1145 | 1156 | 7 | 649 | 656 | 1812 |
| Shatter | 5 | 1 | 155 | 161 | | 48 | 48 | 209 |
| Total | 16 | 2 | 1352 | 1370 | 7 | 708 | 715 | 2085 |

continued

Table 29 continued. Artifact assemblage from 140S362.

| | LOCALITY I | | | | LOCALITY II | | | SITE |
|---|---|---|---|---|---|---|---|---|
| | Test Units | Shovel Tests | Surface | Total | Test Units | Surface | Total | TOTAL |
| GROUND STONE TOOLS | | | 1 | 1 | | 1 | 1 | 2 |
| MINERAL | | | | | | 1 | 1 | 1 |
| UNWORKED BONE | | | | | | 1 | 1 | 1 |
| UNWORKED SHELL | | | | | | 1 | 1 | 1 |
| UNWORKED STONE | 4 | | 5 | 9 | 26 | 1 | 27 | 36 |
| TOTAL | 20 | 2 | 1430 | 1457 | 34 | 797 | 831 | 2288 |

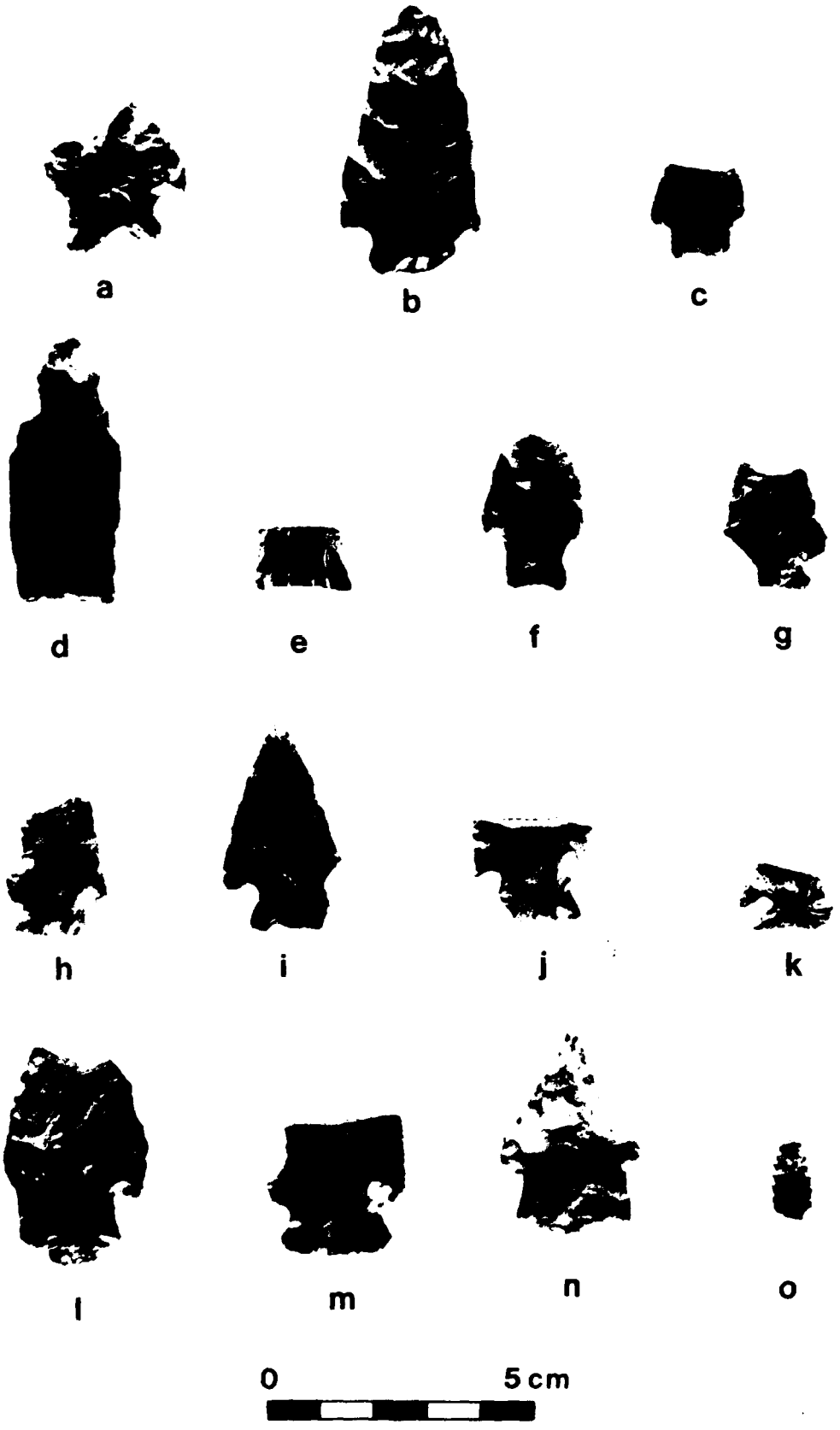



Figure 47. Projectile point assemblage recovered from 140S362: a-c, Locality I; d-o, Locality II.

which is complete. The complete specimen is a medium-sized lanceolate point with straight to slightly excurvate lateral margins and a slightly concave base (Figure 47d). The point exhibits multiple basal thinning flake scars oriented slightly oblique to the long axis of the point. The blade exhibits irregular transverse flaking. The proximal two thirds of the lateral edges of the point are heavily ground. Above the smoothed lateral edges the blade sharply incurves toward the tip. This point is manufactured from a glossy nonlocal grayish-brown chert.

Transversely flaked parallel-sided, concave-based points with lateral and basal edge grinding are associated with the late Paleo-Indian period. While an accurate classification of one specimen is problematical, the point from 140S362 is similar to the San Jon type associated with the late Paleo-Indian Firstview complex (Wheat 1972). San Jon points are one of the most widespread of all Paleo-Indian point types in western North America. As defined by Wheat (1972:154), the Firstview complex is characterized by Firstview and San Jon points, possibly Plainview and Milnesand points. Radiocarbon dated sites containing Firstview complex types fall between 8150 and 10,200 years B.P. Johnson and Holiday (1981) date the complex in the southern Plains from 8500 B.P. to 10,000 years B.P.

The remaining lanceolate points from Locality II consist of two bases. One specimen is a small proximal section of a point with a deep concave base. The basal concavity forms two lobes, one of which is missing due to a transverse fracture. The lateral basal margins flare out. The base and lateral edges have been lightly ground. A transverse fracture is located just above the basal concavity. This tool is made from a local gray fossiliferous chert and appears to have fractured during the manufacturing process.

The last lanceolate specimen consists of the proximal section of a narrow thin lanceolate point (Figure 47e). The base is slightly concave and exhibits multiple basal thinning flake scars oriented parallel to the long axis of the point. The basal lateral margins are slightly concave and both base and lateral margins have been heavily ground. The specimen was manufactured from a pink fossiliferous chert which was probably heated. The base is similar to the Dalton types, although it lacks the usual deep basal concavity. Dalton points are horizon markers for the transitional Dalton period between the Late Paleo-Indian and Early Archaic periods (Chapman 1975). More and More (1983:71) bracket the Dalton period at 8950 to 10,400 years B.P.

Stemmed points from Locality II include two small slightly expanding points with straight bases. One specimen was manufactured from a local brown fossiliferous chert and is similar to the Table Rock Stemmed type (Figure 47f). These points are associated with the Late Archaic period with an estimated temporal span of between 1000 to 3000 B.C. (Chapman 1975). The other specimen is a small fragment that has been extensively reworked. It was manufactured from a non-local white fossiliferous chert.

The balance of the projectile points recovered from Locality II consist of nine corner-notched dart points, three bases from expanding stemmed points, and one corner-notched arrow point. Seven of the corner-notched dart points are sufficiently complete for typological classification. Two are small dart points with expanding stems, straight bases, and shallow corner-notches (Figure 47g-h). The second group consists of three medium-sized corner-notched points with straight to slightly concave bases (Figure 47i-k). This group is similar to the Walnut Valley Corner Notched type from the Walnut phase components at Snyder (Grosser 1977) and Locality II of the Coffey site (Schmits 1981). The third group of corner-notched points consists of three medium-sized expanding stemmed forms with convex bases (Figure 47l-n). One has a slightly expanding stem, pronounced convex base and a single deep corner notch (Figure 47l). The remaining dart points are represented by basal fragments. Two slightly concave based expanding stemmed forms and one convex based expanding stem form are represented. One of the corner-notched dart points was manufactured out of nonlocal white fossiliferous chert; the rest were manufactured of local gray, brown, or pinkish-gray fossiliferous cherts. Five of the specimens appear to have been thermally altered.

The last projectile point from Locality II at 140S362 consists of a corner-notched serrated arrow point (Figure 47o). The point has a transverse fracture occurring on the base. Points of this description are generally classified as Scallorn points and are considered characteristic of the Plains Woodland period.

A total of 92 unstemmed bifaces were recovered from 140S362. Included are one drill, seven knives, 29 blanks and 55 fragments. Approximately 53 percent of these bifaces have been heated. Bifaces from Locality I include 10 blanks and 31 fragments. Three of the biface fragments exhibit additional modification. One proximal section has a retouched projection used as a perforator. One lateral edge fragment had a marginally retouched notch and one distal end was modified for use as a scraper. The bifacial tools recovered from Locality II consist of one drill (Figure 48a), seven knives, 19 blanks, and 24 fragments.

The remaining chipped stone tools from 140S362 consist of scrapers, perforators and edge-modified debitage. A total of 12 scrapers were found distributed between the two localities with six from Locality I and six from Locality II. Four of the six scrapers recovered from Locality I are unifacially worked circular side scrapers (Figure 48c-e). One specimen consists of a marginally retouched chunk with a steep edge angle and step fracture wear. Four of the six scrapers recovered from Locality II are unifaces, two of which are end scrapers and two are side scrapers. One of the side scrapers exhibits a retouched projection similar to a graver spur suitable for graving or perforating tasks (Figure 48c). The remaining specimens are marginally retouched side scrapers.

A total of two perforators were recovered from Locality I. Both are manufactured from flake blanks and exhibit retouched projections suitable for perforating tasks. The edge-modified tools recovered from 140S362 include one edge-modified chunk and 25 edge-modified flakes.

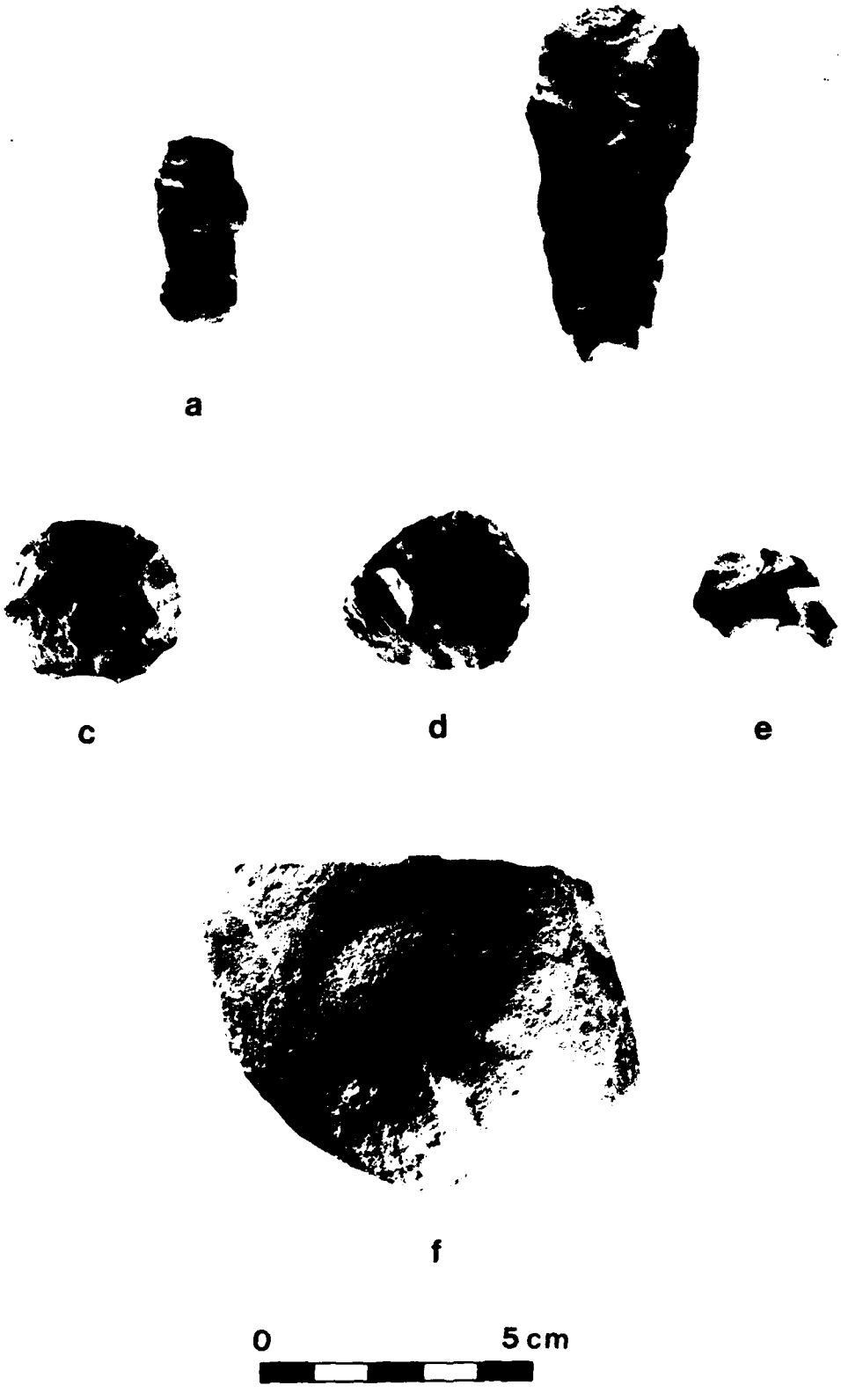



Figure 48. Chipped and ground stone tools recovered from 140S362: a, drill base; b, bifacial knife; c-e, scrapers; f, nutting stone.

Ground stone tools include one hammerstone from Locality I which is a water-worn chert cobble with very light battered wear around one face. The single ground stone implement recovered from Locality II is a pecked and ground sandstone cobble. The specimen exhibits four shallow, ground concavities with one on each face of the tool indicating use as a nutting stone (Figure 48f).

A total of 2085 pieces of lithic manufacturing debris were recovered from 140S362 including 15 cores, 49 chunks, 1812 flakes and 209 pieces of shatter. All but 25 of these artifacts were recovered from the surface. Locality I had the highest debitage concentration, with 65.7 percent being recovered from this locality. Nine cores were recovered from Locality I and six specimens from Locality II. Nine are small, local chert pebbles. All of the chunks are composed of locally available chert pebbles. Many appear to have been thermally fractured. These specimens may have been used as hearth stones, but it seems more likely that the inhabitants were trying to improve the flaking qualities of the chert pebbles through heat treatment. The majority of the flakes are bifacial trimming and resharpening flakes. Primary and secondary decortication flakes are present in small numbers in the assemblage and appear to be derived from the locally available chert pebbles. The balance of the lithic manufacturing debris consists of 209 pieces of shatter, the majority of which (77 percent) was recovered from Locality I.

The remainder of the artifact assemblage from 140S362 consists of one piece of unworked hematite, one small unworked bone, one small piece of unworked mussel shell recovered from Locality II and 36 pieces of unworked stone.

## Discussion and Recommendations

The investigations at 140S362 resulted in the delineation of two localities of cultural debris. Locality I covers an area of 32,300 sq m and appears to represent a single component Plains Woodland occupation based on the styles of projectile points recovered. The lack of ceramics precludes a more definitive designation of cultural affiliation. Locality II extends over some 14,000 sq m and contains late Paleo-Indian, and multiple late Plains Archaic and Plains Woodland components. The Late Archaic component appears to include a possible El Dorado phase component and a more strongly represented Walnut phase component.

One of the characteristics of the chipped stone tool assemblage from 140S362 is the large number of biface fragments and the highly worn condition of most of the implements. Many of the tools exhibit heavy wear, evidence of repeated resharpening or modification for different tasks after breakage. Almost all of the cores and chunks recovered are small cobble and pebble-sized pieces of poor quality locally available chert. These cores were most likely modified into implements rather than being used to generate flake blanks. Most of the debitage is indicative of tool maintenance and modification as indicated by the frequency of small resharpening flakes. Small flakes under 2 cm in size

account for 59.2 percent of the lithic manufacturing debris. Flakes over 2 cm in size, which account for 25.8 percent of the assemblage, are also small, all being under 4 cm in size. Debris classes associated with primary manufacturing (cores, chunks and shatter) account for only 14.9 percent of the assemblage. Therefore, primary tool manufacture, though occurring, was not a very significant activity at the site.

Tools associated with hunting and butchering (projectile points and bifacial knives) constitute the largest identifiable chipped stone tool classes recovered. Artifacts indicative of other tasks are poorly represented or are not represented at all. No heavy-duty bifaces suitable for digging or heavy woodworking are present, nor are any artifacts associated with plant food processing other than the nutting stone recovered from Locality II. No middens or concentrations of burnt rock indicative of more intensive domestic activities were found. Tools associated with hide preparation, such as scrapers and perforators, make up only 7.8 percent of the chipped stone tool assemblage. The small number of generalized light-duty cutting and scraping implements, represented by edge-modified debitage, when compared to the frequency of specialized cutting and piercing tools supports the hypothesis that 140S362 represents a specialized activity occupation. Specialized tools represented by the bifaces constitute 75 percent of the chipped stone tool assemblage compared to the generalized minimally-modified implements which constitute 16.2 percent of the assemblage.

These data clearly indicate that both localities at 140S362 represent hunting camps where the primary activities included hunting, the maintenance and replacement of implements dulled, worn out or broken during hunting, and game processing activities. The restricted number of artifact classes and their specialized nature demonstrate that the site did not function as a long-term habitation, such as a base camp or village.

Locality II at 140S362, though containing multiple components, appears to be similar to Locality I. Two primary occupations are suggested for Locality II. The earliest use of the site occurred during the Late Paleo-Indian period. This occupation is inferred from the recovery of the lanceolate San Jon-like and Dalton-like projectile points. These point styles indicate that the Late Paleo-Indian occupations at 140S362 probably date from 8000-10,000 years B.P. The current tenant, Mr. Small, has two broken unfluted lanceolate points in his personal collection which he is almost certain were recovered from Locality II. If they are from Locality II, this would bring the known number of Late Paleo-Indian period points to five. Since the cultural components at Locality II are mixed due to erosion and plowing, it was not possible to isolate the nondiagnostic classes of tools associated with the Paleo-Indian occupation. The Late Paleo-Indian occupation at this site likely represents a small, briefly occupied hunting camp.

The second primary occupation at Locality II of 140S362 appears to be a Late Archaic or transitional Late Archaic/Plains Woodland Walnut phase component as is evidenced by the presence of a number of Walnut

Valley Corner Notched points. A minor Late Archaic El Dorado phase period occupation appears to be present on the basis of the Table Rock Stemmed point found at Locality II. However, the more intensive occupation is clearly represented by the Walnut phase people who manufactured corner-notched points with expanding stems and straight to concave bases. The sole arrow point recovered from the site is a Scallorn type probably associated with the Plains Woodland period. These data indicate that Locality II at 140S362 was utilized by people in the Late Paleo-Indian, Late Archaic and Plains Woodland periods. The physical remains of these occupations appear to be mixed and are primarily located in the plowzone. There are no data which suggest that the site function differed during any of these occupations, although Late Archaic usage is clearly the most intensive. The range of tool and debris types do not indicate an intensive or long term occupation, such as a village or base camp. Both Localities I and II were probably briefly utilized by hunting parties from the various cultures represented at the site. The most intensive occupations at 140S362 are believed to have occurred during the Late Archaic and Plains Woodland period when both Locality I and II were utilized by the same or similar cultural groups.

In summary, 140S362 appears to be a multiple component briefly utilized hunting camp. Represented are a Late Paleo-Indian, and multiple Late Archaic and Plains Woodland occupations. The mixed Late Paleo-Indian, Late Archaic and Woodland period components of the site are found at Locality II. Locality I appears to be a single component Plains Woodland occupation.

The site is considered a significant cultural resource primarily due to its potential to yield additional data on the earliest defined occupation in the project area, that of the poorly understood Paleo-Indian period. The site also has potential to produce further significant data regarding functionally specialized components of the poorly understood Late Archaic and Plain Woodland period subsistence-settlement systems. While the site lacks well-defined subsurface integrity, limited amounts of debris are present below the plowzone. There is also the potential for truncated or slightly deflated features to be present. Based on these considerations 140S362 is recommended for nomination to the National Register. The site is being negatively impacted by modern agricultural practices which expose the artifacts to unauthorized artifact collectors. The investigators recommend that 140S362 be taken out of agricultural production and be seeded in native grass to mitigate the impact on this site.

## SUMMARY

In the spring and summer of 1982 an intensive cultural resources survey was conducted of 25 percent (450 ac) of the Sun Dance, Coeur d'Alene, Arrow Rock and Turkey Point Public Recreation Areas and along the shoreline of Melvern Lake between elevations of 1034.0 and 1042.3 ft above msl. As a result of the 1982 survey, 17 unrecorded sites were

located and two previously recorded sites were relocated. The newly recorded sites have been officially designated as sites 140S112 through 140S128. Previously recorded sites which were relocated are 140S352 and 140S362. In 1984, three previously recorded sites (140S17, 140S362 and 14LY414) situated outside the 1982 survey area were relocated and tested. Sufficient data to enable National Register eligibility recommendations has been recovered from 19 of the 21 sites. Seven sites (140S17, 140S112, 140S116, 140S118, 140S352, 140S362 and 14LY414) required extensive testing to determine their National Register eligibility status. Twelve sites (140S113, 140S114, 140S115, 140S119, 140S120, 140S121, 140S122, 140S123, 140S124, 140S125, 140S126 and 140S127) did not require subsurface testing to determine their National Register eligibility status. Two sites, 140S117 and 140S128, were located outside the project boundaries and consequently were not tested and consequently, their National Register eligibility has not been determined. The site type, cultural affiliation, statement of research significance and National Register recommendations are presented in Table 30.

Six sites (140S112, 140S113, 140S114, 140S121, 140S122 and 140S352) are limited-use sites with unknown prehistoric cultural affiliations. Based on survey data, five of these sites were determined to be ineligible for nomination to the National Register. Based on testing, 140S352 was determined to have insufficient content to warrant nomination.

Five sites (140S17, 140S116, 140S117, 140S362 and 14LY414) are multicomponent. The Hyde site (140S17) is a residential camp with Middle Archaic and Late Archaic occupations. The early Plains Archaic component at the Hyde site, and the Archaic occupations at two other sites in the upper Marais des Cygnes basin, appear to represent a previously unrecognized early Plains Archaic complex that is contemporaneous with other early occupations from the eastern Prairie Plains border. 140S116 and 140S117 each have Historic occupations and prehistoric components of unknown cultural affiliation. 140S362 is a large specialized hunting camp with Paleo-Indian, Late Archaic and Plains Woodland components. 14LY414 consists of the remains of a largely destroyed Plains Village Pomona focus village and an earlier Late Archaic Walnut phase occupation. 14LY414, the Hyde site (140S17) and 140S362 are recommended to be eligible for the National Register. 140S116 is not recommended to be eligible for the National Register. 140S117 is located outside the project area and the National Register eligibility status can not be determined from survey data.

Three sites (140S115, 140S118 and 140S119) are Plains Woodland occupations. 140S115 and 140S119 appear to be limited-use sites. Based on survey data, these sites are not eligible for the National Register. 140S118 was tested and found to be a large Plains Woodland period hunting camp which was probably seasonally occupied. Based on relatively high artifact frequencies and the lack of data on Plains Woodland hunting camps, this site is recommended to be eligible for the National Register. 140S120 was determined to be a Plains Archaic period limited-use site. The site is thoroughly disturbed by shoreline erosion and it is not eligible for the National Register.

Table 30. Topographic position, soil type, cultural affiliation, inferred site function, significance and Naticnal Register recommendations for sites located in the Melvern Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE | NOT ELIGIBLE |
|---|---|---|---|---|---|---|---|
| 14LY414 | Lowlands | Osage | Plains Village, Pomona focus | Habitation | Plains Village period subsistence-settlement systems. | + | |
| 140S17 | Lowlands | Osage | Plains Middle Archaic, Plains Late Archaic | Habitation | Considerable Middle and Late Archaic period subsistence-settlement systems. | + | |
| 140S112 | Uplands | Summit | Unknown Prehistoric | Camp | Site lacks content and subsurface integrity. Artifacts recovered from disturbed shoreline context. | | + |
| 140S113 | Lowlands | Osage | Unknown Prehistoric | Limited-Use | Site lacks content and subsurface integrity. | | + |
| 140S114 | Uplands | Lebo-Summit | Unknown Prehistoric | Limited-Use | Site lacks content and subsurface integrity. Artifacts may not be in situ. | | + |
| 140S115 | Uplands | Olpe-Kenoma | Unknown Prehistoric | Limited-Use | Site lacks content and subsurface integrity. | | + |

continued

Table 30 continued. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Melvern Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE/NOT ELIGIBLE |
|---|---|---|---|---|---|---|
| 140S116 | Uplands | Clareson-Eram | Historic Euroamerican, Unknown Prehistoric | Farmstead Camp | Site is situated in a disturbed area. Lacks subsurface integrity. | + |
| 140S117 | Uplands | Dennis | Historic Euroamerican, Unknown Prehistoric | Farmstead Camp | Unknown. Site is located outside designated survey area. | |
| 140S118 | Uplands | Dennis | Plains Woodland | Camp | Woodland Period subsistence-settlement patterns. | + |
| 140S119 | Lowland | Verdegris | Plains Woodland | Limited-Use | Site area eroded. Site lacks content and subsurface integrity. | + |
| 140S120 | Uplands | Clareson-Eram | Plains Archaic | Limited-Use | Site area eroded. Site lacks content and subsurface integrity. | + |
| 140S121 | Uplands | Clareson-Eram | Unknown Prehistoric | Limited-Use | Site area eroded. Site lacks content and subsurface integrity. | + |

continued

Table 30 continued. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Melvern Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE/NOT ELIGIBLE |
|---|---|---|---|---|---|---|
| 140S122 | Uplands | Clareson-Eram | Unknown Prehistoric | Limited-Use | Site lacks content and subsurface integrity. | + |
| 140S123 | Uplands | Dennis | Historic Euroamerican | Farmstead | Site disturbed. | + |
| 140S124 | Uplands | Summit | Historic Euroamerican | Farmstead | Site disturbed. | + |
| 140S125 | Uplands | Clareson-Eram | Historic Euroamerican | Farmstead | Site disturbed. | + |
| 140S126 | Uplands | Clareson-Eram | Historic Euroamerican | Farmstead | Insufficient content. Too recent. | + |
| 140S127 | Uplands | Clareson-Eram | Historic Euroamerican | Farmstead | Architectural remains are in a poor state of preservation. | + |
| 140S128 | Uplands | Clareson-Eram | Historic Euroamerican | Farmstead Cabin | Probable. Ruins are in an excellent state of preservation. Located outside survey area. | |

continued

Table 30 continued. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Melvern Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION | SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE/NOT ELIGIBLE |
|---|---|---|---|---|---|---|
| 140S352 | Lowland | Osage | Unknown Prehistoric | Camp | Site lacks content. | + |
| 140S362 | Uplands | Clareson-Eram | Paleo-Indian, Plains Archaic, Plains Woodland | Hunting Camp | Considerable. Paleo Indian, Plains Archaic subsistence-settlement systems. | + |

The remaining six sites, 140S123 through 140S128, are all Historic period occupations. 140S123, 140S124, 140S125 and 140S126 and 140S129 were not recommended to be National Register eligible based on their disturbed conditions. 140S128 is located outside the project area, but the preserved condition of the site indicates that it may be significant.

All but three of the prehistoric sites which were located during the 1982-1984 survey consist of relatively small hunting camps or limited-use extractive sites. Eight of these camps or limited-use sites (140S113, 140S114, 140S115, 140S117, 140S118, 140S119, 140S120 and 140S122) are located near the valley walls or slopes. Only two campsites, 140S352 and 140S362, are located on upland terrain. 140S362 is a large multicomponent hunting camp. The Hyde site (140S17) and 14LY414 are residential camps situated on lower floodplain terraces. All six of the Historic period sites are located on upland terrain. The two multicomponent prehistoric and historic occupations are also located on upland terrain.

The results of the survey data suggest that small Plains Woodland and Archaic hunting camps or extractive sites are located in micro-environmental zones near the transition of upland (xeric) prairie and lowland (mesic) woodland communities on the slopes or floodplain. These transition zones likely support higher densities of fauna and flora native to both the xeric upland and mesic slope woodland environments making them efficient collecting and hunting zones. The larger Archaic, Plains Woodland and Plains Village period base camps and village sites such as 14LY414, 140S17 and 140S347 appear to be located on the floodplains or terraces of the Marais des Cygnes River. All of the Historic period sites were located on upland terrain.

# IX. SURVEY AND TESTING AT POMONA LAKE

James A. Donohue and John M. Parisi

## INTRODUCTION

Pomona Lake is situated in the Osage Plains of east central Kansas approximately 35 miles south of Topeka, Kansas (Figure 1). The Pomona Lake Dam is situated on Hundred and Ten Mile Creek just below its confluence with Dragoon Creek and just above its confluence with the Marais des Cygnes River (Figure 49). The dam is about seven miles northwest of Pomona and 17 miles west of Ottawa. The dam was completed in 1963 and is a rolled earthfill embankment. Flood control pool level is located at 1003 ft above msl and inundates a surface area of 8600 ac. The normal multipurpose pool level is at an elevation of 974 ft above msl and has a surface area of 4000 ac and a shoreline 52 miles long.

The scope-of-work for the 1982 field work at Pomona Lake required an intensive pedestrian shoreline survey for cultural resources between the elevations of 974.0 and 986.4 ft above msl and the testing of cultural resources which were located to determine their eligibility for the National Register. The 1982 survey resulted in the location of 12 sites. In the early spring of 1984, Pomona Lake was drawn down from 974 ft above msl to the 970 ft above msl contour for purposes of dam maintenance. This draw-down resulted in the exposure of additional terrain adjacent to sites located along the shoreline in 1982. In February and March of 1984 an additional survey and limited testing were conducted on the exposed terrain adjacent to five sites (140S106, 140S108, 140S109, 140S111 and 140S367). Two sites, 140S105 and 140S350, which were not tested in 1982 were relocated and tested to determine their National Register status. The 1984 investigations resulted from recommendations presented in the 1983 draft report (Schmits 1983) and were conducted under terms of the modification to contract DACW41-81-C-0149. The objectives of the 1984 investigations were to document the spatial limits of the above sites on the newly exposed terrain, to determine their National Register status and to evaluate the effects of inundation on these cultural resources.

Land uses in the project area include wildlife management areas, private development and recreational parks. The wildlife management areas are generally covered by timber and grassland and constitute a substantial amount of the project lands. Lands leased for agricultural purposes are predominantly located on the upper reaches of the lake floodpool. Private developments include the community of Holiday Cove and several lake shore docks. Eight public recreational parks are also located in the project area: Management, Michigan Valley, Wolf Creek, Cedar, Carbolyn, Dragoon and Vassar State Park.

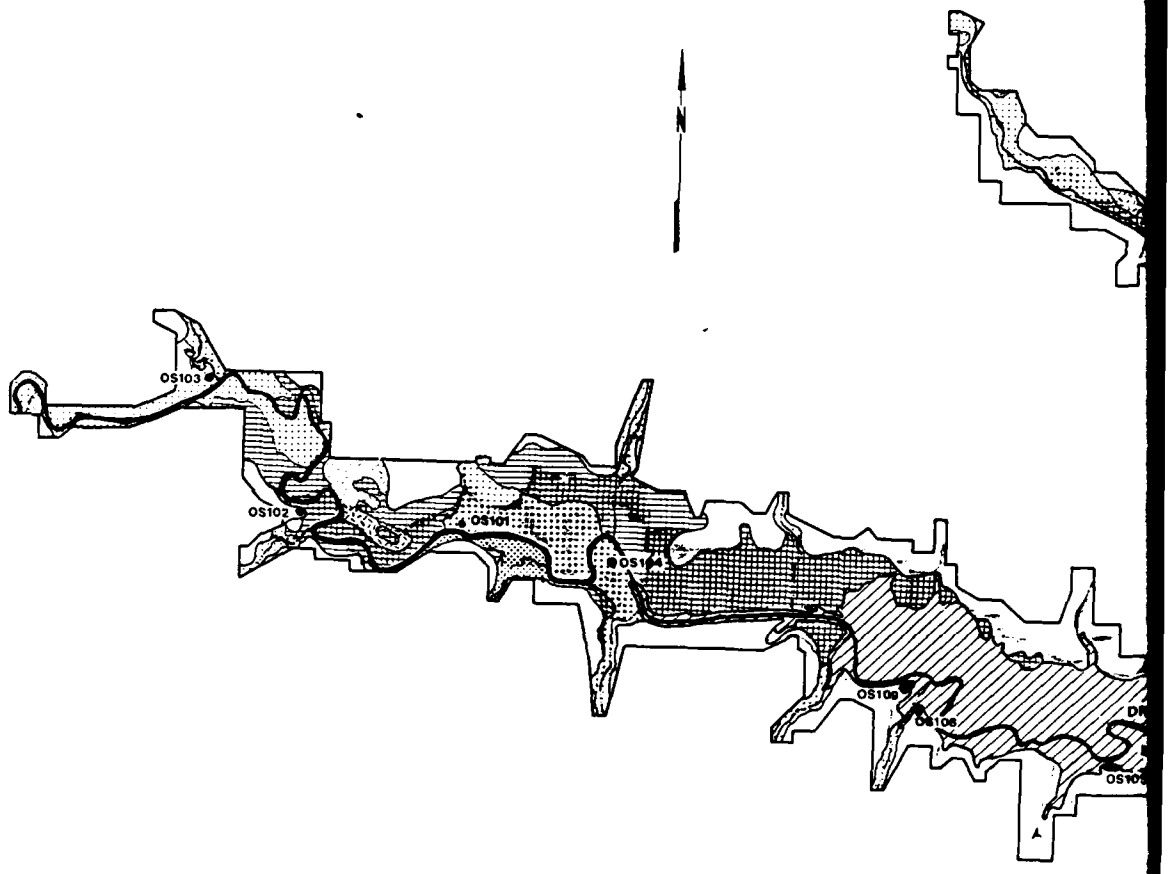
The 1982 cultural resources survey at Pomona Lake consisted of pedestrian survey along the entire perimeter of the shoreline between the elevations of 974.0 and 986.4 ft above msl (Figure 49). Survey transects paralleled the shoreline and were spaced at maximum intervals of 35 m, beginning at the water's edge. The number of transects varied, depending on the distance between the shore and the upper contour lines which demarcated the survey area. Due to an unusually large amount of precipitation during the spring of 1982, the outer boundary of the survey zone was clearly delineated by a scatter of driftwood and dead vegetation deposited at an elevation of 990 ft above msl, the high water level of the floodpool during the spring of 1982. The inundation of the floodpool shoreline greatly improved surface visibility along the shoreline by scouring vegetation, thus reducing the need for shovel testing over much of the shoreline survey area. However, these flood waters also deposited a veneer of silt and mud along the shore, especially in depressional areas along tributary inlets feeding into the lake area. In silted areas with a high probability for archaeological sites, such as terrace remnants or stream confluences, transects were reduced to 10 m intervals. Another field adjustment made to compensate for the siltation was to adjust the shoreline transect so that the transect covered both the water's edge, where wave action had eroded and removed the newly deposited silt, and the top of the beach where silting was less severe. In addition, the location of isolated artifact finds were resurveyed following periods of rain.

The survey methodology was further expanded to incorporate an examination of the cutbanks of the upper regions of Pomona Lake, Dragoon Creek, Plummer Creek and Hundred and Ten Mile Creek by canoe. This technique enabled close inspection of high cutbanks and other physiographic features.

The intensive cultural resources survey at Pomona Lake also included interviews with local artifact collectors designed to gather information on the location and content of known sites. Interviews were conducted primarily with Park Ranger Ben Streeter, an employee of Vassar State Park. Relevant artifact collections were photographed and pertinent information regarding possible site locations was obtained. Subsequent field verification of this information indicated the presence of two sites, 140S101 and 140S105. Additional information was also obtained on two isolated find spots.

The 1984 survey of terrain between the 974 ft and 970 ft contours adjacent to the sites investigated in 1982 was conducted in a similar manner to the earlier survey. The 1984 survey zone was generally much narrower, only rarely exceeding 50 m in width, and was restricted to the general vicinity of the previously recorded sites. Survey conditions in 1984 were excellent, with a surface visibility of 100 percent over much of the exposed area.

Pomona Lake was divided into four major survey units based on hydrologic and geomorphic features. The four major survey units defined at the lake were designated as the North Survey Unit, the Northwest Survey Unit, the Central Survey Unit and the West End Survey Unit. Each major survey unit was subdivided into various survey tracts based




● SITES INVESTIGATED IN 1982-1984

1982-1984 SURVEY AREA

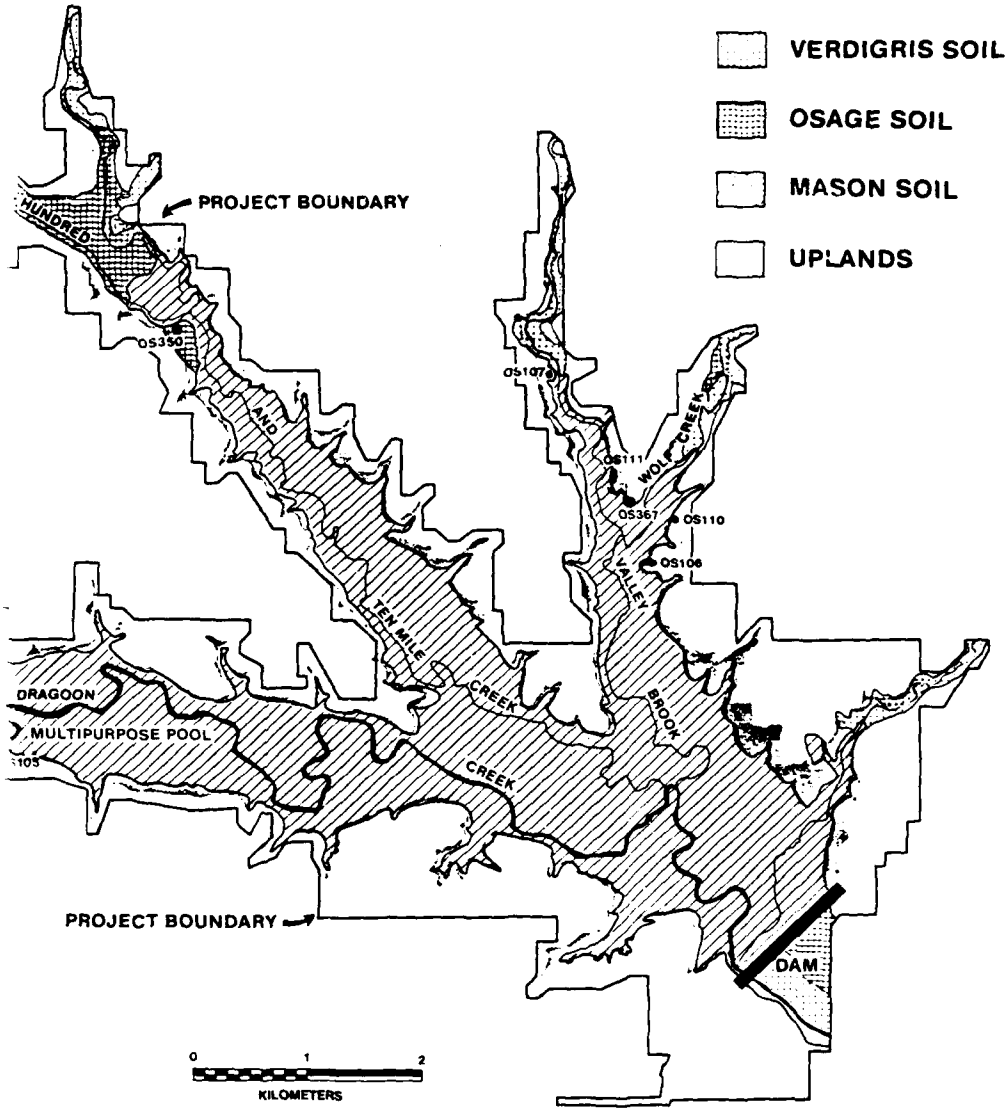



Figure 49. Location of area surveyed and sites investigated during the 1982-1984 survey at Pomona Lake.

on hydrologic and land use features. The smaller survey tracts facilitated the field description of the numerous variables encountered in the continuous shoreline survey.

The North Survey Unit consisted of the shoreline extending from the dam axis northward along the Wolf Creek arm and Valley Brook arm of Pomona Lake. The eastern part of the unit is fairly wide, traversing slopes and upland surfaces, which are mapped largely as the Lula, Summit and Clareson-Eram soil complexes along the southern two thirds of the eastern shore. The northern third of the east side of the North Survey Unit consists of floodplain, which is primarily mapped as soils of the Verdigris and Osage series. The shoreline survey zone along the eastern side of the North Survey Unit varied from 35 m to 390 m in width. The western side of the North Survey Unit was a relatively narrow zone, generally 60 m in width although expanding up to 200 m in width in the upper reaches of Valley Brook Arm. The western side of the North Survey Unit consists of upland and floodplain terrain made up of soil complexes mapped primarily as Summit and Clareson-Eram.

Survey conditions in the North Survey Unit were variable. Surface visibility along the shoreline was generally excellent, varying from 75 to 100 percent. Survey conditions along the inland intertributary transects were also favorable with 25 to 75 percent of the surface visible. The most difficult conditions were encountered within the narrow tributary valleys, which were covered by marsh and brush. Except along the shoreline, transects along the tributaries normally required shovel cuts which were excavated at 50 m intervals whenever surface visibility was less than 25 percent.

A total of five sites (140S106, 140S107, 140S110, 140S111, and 140S367) were located in the North Survey Unit. Four of these sites were previously unrecorded, while 140S367 was recorded by Thomas Witty of the Kansas State Historical Society in 1976. 140S106 is situated on an upland slope mapped as the Lula soil complex. 140S107 is situated on a footslope soil, mapped as the Summit and 140S110 is a Historic site located on upland terrain mapped as the Lula complex. Both 140S111 and 140S367 are located on terraces mapped as the Summit soil complexes.

The Northwest Survey Unit commences at the southernmost tip of Hundred and Ten Mile Park and consists of the shoreline along Hundred and Ten Mile Creek and Plummer Creek. The shoreline survey zone along the eastern side of the Northwest Survey Unit is relatively narrow, rarely exceeding 120 m in width. The eastern side of the Northwest Survey Unit covers primarily upland terrain, which is mapped as the Olpe-Kenoma, Eram-Lula and Clareson-Eram complexes. The western shoreline survey zone crosses similar landforms and is narrow, usually 60 m or less in width, although the survey zone expanded to a maximum width of approximately 600 m near the confluence of Hundred and Ten Mile and Plummer creeks. Survey conditions in the Northwest Survey Unit were generally favorable. Surface visibility was usually 100 percent along the shoreline transects, while the interior transects had approximately 40 percent visibility. Shovel cuts were excavated at 50 m intervals wherever surface visibility was below 25 percent.

Vegetation encountered in the Northwest Survey Unit consists of wooded slopes with areas of exposed bedrock in the southern part of the unit. The central portion of the unit consists of wooded slopes, while terraces are covered by pasture, brush and plowed fields. Near the Hundred and Ten Mile and Plummer Creek confluence, broad expanses of the floodplain were covered with wetland vegetation and cockleburs. Thick deposits of silt were encountered in this area. The upper reaches of the Northwest Survey Unit increasingly consisted of narrow valley bottoms with steep slopes. Ground cover consisted of timber and pastures along the uplands and slopes, while the lowlands were silty marshes, plowed fields, pasture, brush and timber.

No sites were located in the Northwest Survey Unit during the 1982 investigation. One previously recorded site, 140S350, was reported to be located in this unit, but was not located in 1982. The 1984 investigation of the draw-down zone between the 974 and 970 ft contours resulted in the relocation and testing of 140S350.

The Central Survey Unit consists of the shoreline survey zone along the central section of the Dragoon Creek arm of Pomona Lake. The survey zone along the north shore of this unit crosses uplands, which are mapped as the Olpe-Kenoma, Clareson-Eram and Kenoma series, in the eastern third of the area, large sections of terrace in the central section and smaller areas of slope and terrace terrain, which is mapped as the Summit and Osage soil complexes, at the western end of the area. The shoreline survey zone was typically narrow, usually only 40 to 60 m in width, except at the western end of the area where it expanded to 300 m in width. Survey conditions along the north shore area of the Central Survey Unit were generally quite good. The spring's high waters had cleared the steep upland and terrace slopes of vegetation, often exposing bedrock and leaving gravel bars. Surface visibility along the shoreline transects ranged from 90 to 100 percent. The most difficult survey conditions were encountered in the intermittent tributary valleys. Shovel cuts were excavated at 50 m intervals whenever ground surface visibility was less than 25 percent.

The south shore of the Central Survey Unit was narrow and often steep, ranging from 30 to 150 m in width. The survey zone crossed narrow segments of floodplain, terrace and uplands with broader slope areas in the central section of the area. The soils in this area are mapped as the Summit, Clareson-Eram and Lula, primarily. Survey conditions along the south shore were favorable with 80 to 100 percent of the ground surface visible along the shoreline. Interior transects usually encountered surface visibility ranging from 30 to 60 percent. Transects located in the narrow tributary valleys encountered heavier stands of vegetation and shovel cuts were excavated at 50 m intervals in these areas.

Only one site was located in the Central Survey Unit. This site, 140S105, was reported to the investigators by a local informant and was located on soils mapped as the Summit complex along the south shore upland slopes of Dragoon Creek.

The West End Survey Unit consists of the shoreline survey zone west of the Dragoon Creek channel. The West End Survey Unit differs strikingly from the North, Northwest and Central Survey Units in that only lowland terrain, consisting of floodplain and terraces along Dragoon Creek, is located within the shoreline survey zone. The soils mapped in to this area are primarily the Osage, Mason and Verdigris series, with lesser areas of Lula, Dennis and Summit also present. Survey conditions in this unit were generally excellent. Large areas of the terraces had been cultivated and planted in corn, beans or milo and had ground visibilities ranging from 80 to 100 percent. Survey of the south-flowing tributaries encountered the most difficult survey conditions, often with thick stands of brush and woods present. Shovel cuts were excavated at 50 m intervals whenever the ground surface visibility was less than 25 percent. The channel of Dragoon Creek in the West End Survey Unit is relatively deeply incised into the floodplain, exposing steep cutbanks. These cutbanks were examined for evidence of buried sites by means of a canoe survey on Dragoon Creek from Highway 75 west to the termination of the survey area near Popcorn Creek. However, no buried sites were found.

A total of six previously unrecorded sites were located within the West End Survey Unit. These sites were offically designated 140S101, 140S102, 140S103, 140S104, 140S108 and 140S109. Three of these sites, including 140S101, 140S103 and 140S104, are situated on the Osage and Verdigris floodplain soil series. 140S102, which was located slightly outside of the survey zrea, is situated on a higher terrace, mapped as the Dennis complex. 140S108 and 140S109 are situated primarily on upland terrain mapped as the Lula and Clareson-Eram complexes, respectively.

The 1982-1984 intensive cultural resources survey at Pomona Lake consisted of an inventory of cultural resources between the elevations of 974 and 986.4 ft above msl and limited surveys between the 974 ft and 970 ft contours above msl. This work resulted in the location of 11 previously unrecorded sites and relocation of two previously recorded sites. Five sites located in the North Survey Unit include 140S106, 140S107, 140S110, 140S111 and the previously recorded site, 140S367. 140S350 was relocated in the Northwest Survey Unit. One site, 140S105, was located in the Central Survey Unit. Six sites, designated 140S101, 140S102, 140S103, 140S104, 140S108 and 140S109 were located in the West End Survey Unit. A description of each site, its probable function and cultural affiliation as well as recommendations recording each site's possible eligibility for the National Register follows below.

## 140S101

This site consists of a very light lithic scatter situated on soils mapped as the Osage complex near Dragoon Creek (Figure 49). The site is located on the north bank of Dragoon Creek approximately 90 m northwest of its confluence with an intermittent stream. At the time of the investigations, the site was planted in milo with surface visibility varying between 10 and 30 percent. The location of 140S101 was reported

to the investigators by a local informant who stated that a site containing ceramics was located in the vicinity of the confluence of the intermittent stream and Dragoon Creek. The initial shoreline survey had failed to locate any sites near this area. Reinspection of the area resulted in the recovery of eight small flakes over an area approximately 20 by 30 m. An additional reconnaissance of the site area was conducted a month later and three more flakes were recovered.

The intensive survey indicated that 140S101 is a small, limited-use site. The 11 flakes recovered are all of a similar gray chert, suggesting that this site may represent a small knapping station. Several eroded swales were noted within the site vicinity indicating that the site might be disturbed and that the debris might not be in situ. Based on the survey data, 140S101 did not warrant further subsurface testing. The small size and limited content of this site indicate that 140S101 does not meet the eligibility requirements for the National Register.

## 140S102

This site consists of a large moderately dense scatter of lithics located on soils mapped as the Dennis complex approximately 75 m northwest of the confluence of Coyote and Dragoon creeks (Figure 49). When located during the survey, the site was located in a corn field with surface visibility of 75 to 80 percent. Surface reconnaissance indicated that the site extended over an area of 12,000 sq m. A general surface collection was made from the site but due to the location of the site outside of the survey area, no evaluative test excavations were conducted.

### Artifact Assemblage

Materials recovered from 140S102 include one ceramic sherd, 13 chipped stone tools and 13 pieces of lithic manufacturing debris. Burnt rock, which probably represents plowed up hearth stones, was observed on the site but not collected.

The body sherd from 140S102 is a smoothed-over cordmarked indurated clay or grog tempered sherd (Figure 50a). Exterior and interior surfaces of the sherd are tan and the core is very dark brown. This sherd is similar to the Pomona Ware ceramics associated with the Pomona focus (Wilmeth 1970; Witty 1978).

The chipped stone tools from 140S102 include one small, triangular side-notched dart point with a slightly concave base (Figure 50b), one biface fragment, two marginally retouched end scrapers and nine edge-modified flakes. One edge-modified flake has been thermally altered. The small side-notched dart point has a ground base and notches and is similar to points recovered from early Plains Archaic sites, such as 140S17 at Melvern Lake. The presence of this point indicates the presence of an earlier Archaic component at the site.




Figure 50. Artifacts recovered from 140S102, 140S103, 140S104 and 140S106: a-b, body sherd and projectile point from 140S102; c-e, rim sherds and projectile point from 140S103; f-i, body sherd and projectile points from 140S014; j-o, body sherds and projectile points from 140S106.

The lithic manufacturing debris from 140S102 includes three chunks, seven flakes and three pieces of shatter of which one flake and two chunks have been thermally altered.

### Discussion and Recommendations

140S102 is a large, multicomponent site situated on a terrace of Dragoon Creek. Since this site is located outside of the project area, no subsurface investigations were conducted. The clay tempered body sherd indicates a probable Pomona focus Plains Village component. The small side-notched dart point is similar to the early Plains Archaic points from 140S17, suggesting the presence of an early Plains Archaic component at 140S102. The small sample of potentially diagnostic artifacts recovered from this site makes the exact cultural and temporal affiliation of 140S102 uncertain. The size of this site is interpreted to indicate that 140S102 is a residential site.

140S102 is the only site located during the survey of Pomona Lake that is situated on what is presumably a T-1 terrace of Dragoon Creek. Because of the early material present, it is potentially significant. However, further evaluative investigations would be necessary to determine this site's eligibility for the National Register. Modern agricultural practices are having a negative impact on the site's subsurface integrity, as evidenced by scatters of what may be plowed up hearth stones. Several gullys are also forming within the site area as a result of sheet wash. Based on these impacts and because 140S102 potentially contains significant data, further potential negative impact should be avoided by taking the site out of agricultural production.

## 140S103

140S103 consists of a light lithic and ceramic scatter situated on Verdigris complex soils adjacent to Dragoon Creek (Figure 49). This site is located on the north bank of Dragoon Creek approximately 50 m northwest of the confluence of Popcorn and Dragoon creeks. Cultural materials were found on the terrace crest and slope along the southeast side of an abandoned channel of Dragoon Creek. The abandoned channel may once have been an oxbow lake. When investigated in 1982 the site was planted in corn with a surface visibility varying from 0 to 30 percent. No temporally diagnostic artifacts were found. The site was revisited in November of 1984 after it had been freshly disced and plowed. Surface visibility was 100 percent, however, the lack of rain on the freshly cultivated ground made survey conditions less than optimal. As indicated by a light scatter of burnt rock, the site extended 40 miles along the old meander scar for a distance of 200 m and has an estimated area of 8000 sq m. Temporally diagnostic artifacts recovered in 1984 include ceramics and a projectile point. This site is located on Corps of Engineers project lands, but is situated outside of the project survey area and therefore subsurface investigations were not conducted.

## Artifact Assemblage

The surface reconnaissance at this site located 37 artifacts including seven ceramic sherds, eight chipped stone tools, 19 pieces of lithic manufacturing debris, two burnt rocks and one unmarked bone. The ceramics consist of two rim sherds and five body sherds. One rim sherd is a thin, decorated, collared grit tempered sherd. The specimen has a rim decorated with incised parallel lines located just below and parallel to the lip; a second set of incised lines is oriented diagonally to the lip forming a triangle (Figure 50c). The incised designs are bordered by cord-wrapped stick impressions located just below the collar. The lip also exhibits angled dowel impressions. This sherd may indicate a cultural affiliation with one of the Central Plains complexes dating to the Plains Village period such as the Upper Republican or Smoky Hill phases. The second rim is a large smoothed-over cordmarked rim with a flat lip (Figure 50d). The specimen is grog tempered. Although quite thick, the specimen is reminiscent of Pomona ware. All five of the body sherds are small fragments; three are cordmarked and two are plain surfaced. One cordmarked specimen is limestone and shell tempered, one cordmarked and one plain surfaced are both grit tempered, and one cordmarked and one plain surface sherd are tempered with indurated clay. These body sherds fall within the range of Pomona ware, but the somewhat thicker grit tempered sherds may indicate an earlier Plains Woodland period occupation.

Chipped stone tools found at 140S103 include one corner-notched dart point, one bifacial blank, one scraper and five edge-modified flakes. The dart point is a medium-sized triangular, corner-notched point with an expanding stem and convex base (Figure 50c). Part of the basal edge is missing due to a transverse fracture. This tool is manufactured from a dull reddish, fossiliferous chert which appears to have been heated. This point resembles Woodland and larger dart points recovered from Pomona's four sites. Other chipped stone tools found at 140S103 consists of one small bifacial blank fragment, one marginally retouched scraper and five edge modified flakes. Recovered lithic manufacturing debris includes four cores, one chunk, nine flakes and five pieces of shatter. Two samples of burnt limestone and one piece of unworked bone were also recovered.

## Discussion and Recommendations

140S103 consists of a large light lithic and ceramic scatter located near the confluence of Popcorn and Dragoon creeks. The site covers an estimated 8000 sq m area. The small assemblage of diagnostic artifacts suggest a Plains Village temporal period for the site, possibly associated with a Central Plains Complex and/or Pomona focus occupation. The diagnostic artifacts from the site, such as the large corner-notched dart point and thick cordmarked rim, also exhibit Woodland characteristics. Further investigation is needed to firmly delineate the cultural affiliation of 140S103. The scatter of burnt limestone indicates that features such as hearths are being impacted by agricultural practices. This site appears to be a significant cultural

resource and it is recommended that 140S103 be tested to determine its National Register status.

## 140S104

This site consists of a light scatter of lithic and burnt rock situated on a small rise on a terrace of Dragoon Creek. The site is located approximately 80 m west of Dragoon Creek within a large meander of the drainage (Figure 51). At the time the site was tested, the site was planted in soy beans with a surface visibility of approximately 30-40 percent (Figure 52). Mapping of surface artifacts indicated the site extended over a 70 by 60 m area. A total of seven test units were excavated at 20 m intervals. The subsurface investigations revealed that cultural materials are present from the surface to a maximum depth of 60 cm below surface. No midden staining or features were encountered. The densest concentration of cultural debris was encountered in Test Unit 4, with nearly 50 percent of the artifact assemblage being recovered from this unit.

### Soil Stratigraphy

140S104 is situated on soils mapped by the Osage County Soil Survey as the Verdigris silt loam. This soil is a well drained floodplain soil formed on relatively level deposits of silty alluvium. The upper profile consists of a very dark grayish brown silt loam extending to a depth of 36 cm, followed by a dark brown silt loam extending to a depth of 89 cm. The subsoil is a brown silt loam which extends to a depth of 150 cm. All of the test units excavated at 140S104 exhibited similar profiles. The most concentrated cultural deposits were encountered in Test Unit 4. The profile for this unit is presented below.

| | | |
|---|---|---|
| Ap | 0-20 cm | Very dark grayish brown (10YR3/2) silt loam; weak to moderate fine granular structure. |
| A1 | 20-33 cm | Very dark grayish brown (10YR3/2) silt loam; weakly developed subangular blocky structure. |
| AC | 33-80+cm | Dark brown (10YR3/3) sandy silt loam; granular to weak subangular structure. |

Cultural materials were encountered in the Ap, A1 and upper AC horizons. The most concentrated cultural deposits are associated with the A1 and upper AC horizons where 64 percent of the cultural materials recovered from Test Unit 4 are found.

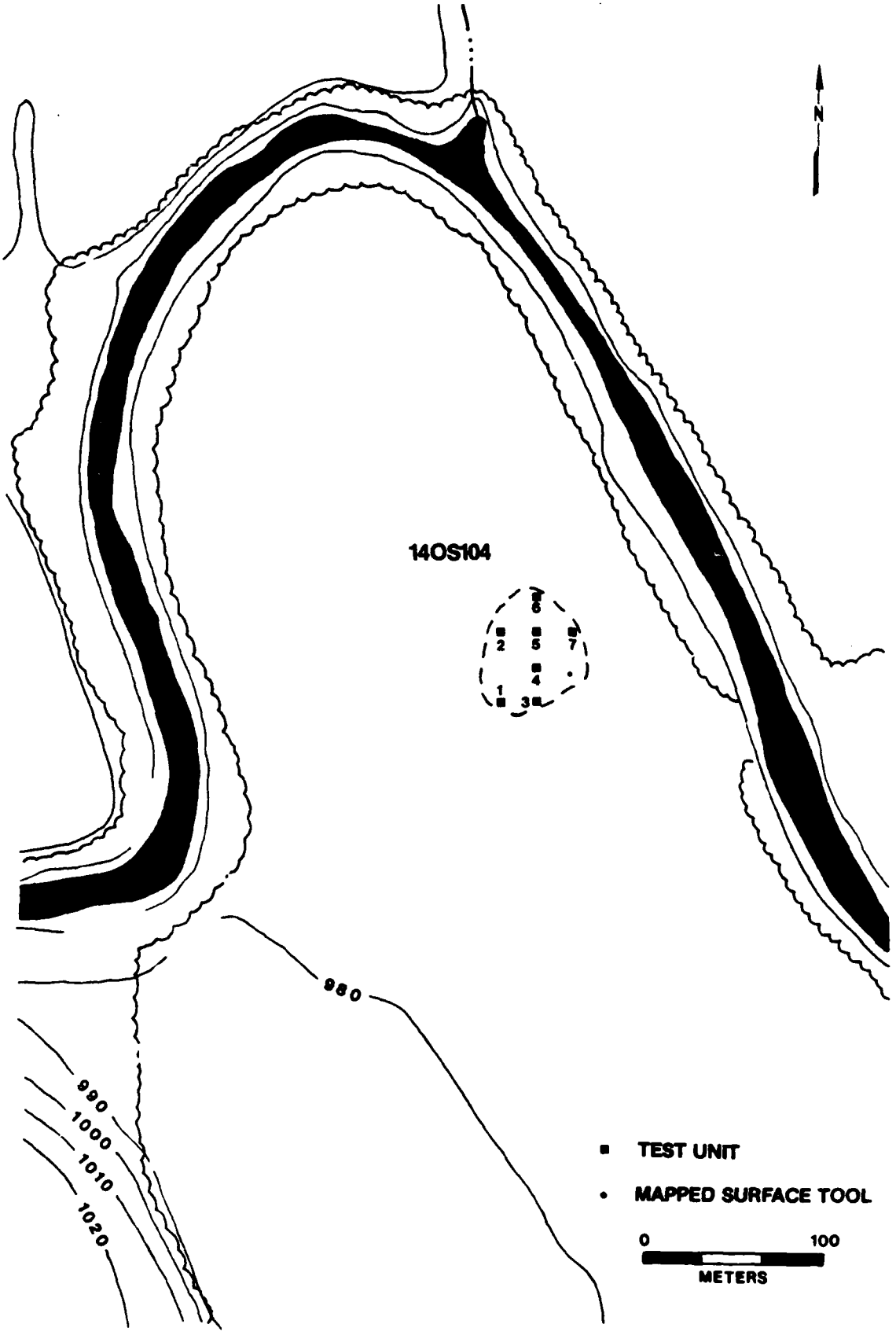



Figure 51. Location and plan view of test excavations at 140S104.





Figure 52. General view of sites 140S104 and 140S105. General view to the east of 140S104 (upper). General view of 140S105 (lower).

## Artifact Assemblage

A total of 105 artifacts were recovered from 140S104. This assemblage includes three ceramic sherds, 13 chipped stone tools, 51 pieces of lithic manufacturing debris, and 38 miscellaneous burnt rocks and unworked stones (Table 31).

Table 31. Artifact assemblage from 140S104.

| | Test Units | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Surface | TOTAL |
| CERAMICS | | | 3 | | | | | | 3 |
| CHIPPED STONE TOOLS | | | | | | | | | |
| Projectile Points | | 1 | | 1 | | | | 1 | 3 |
| Scraper | 1 | | | | | | | | 1 |
| Edge-Modified Flakes | | 1 | | 2 | | | | 6 | 9 |
| Total | 1 | 2 | | 3 | | | | 7 | 13 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | |
| Chunks | | | | 2 | | | 1 | | 3 |
| Flakes | | 2 | 2 | 20 | | | 1 | 6 | 31 |
| Shatter | 1 | 1 | | 11 | 1 | 1 | | 2 | 17 |
| Total | 1 | 3 | 2 | 33 | 1 | 1 | 2 | 8 | 51 |
| BURNT ROCK | | | 2 | 5 | 5 | 1 | | 15 | 28 |
| UNWORKED STONE | | 1 | | 9 | | | | | 10 |
| TOTAL | 2 | 6 | 7 | 50 | 6 | 2 | 2 | 30 | 105 |

The three body sherds were recovered from a depth of 58 cm in Test Unit 3. All three have a plain, smoothed, surface finish. Two sherds have tan to light brown exterior colors and a dark brown to black core (Figure 50f). These specimens are grit tempered and are 6.5 to 7 mm in thickness. The third specimen is a small, smoothed surfaced, indurated clay tempered sherd with a thickness of 6 mm. Although vessel form or size cannot be determined from these fragments, at least two vessels are

represented. These sherds are similar to types recovered from the Cow-Killer site (Reynolds 1982), which suggests the presence of a Plains Woodland Greenwood phase component.

The chipped stone tool assemblage recovered from 140S104 consists of three projectile points, one scraper and nine edge-modified flakes. The projectile points include two medium-sized corner-notched dart points and one corner-notched arrow point. One dart point is from the upper 20 cm of Test Unit 2, while the second is from the surface. The arrow point was recovered from a depth of 23 cm in Test Unit 4. The dart point recovered from the surface is a broad triangular corner-notched form with alternate beveled edges and a diagonal fracture across the base (Figure 50g). The corner notches are broad and fairly deep. The base appears to be straight. The dart point recovered from the test unit is a corner-notched form with a triangular blade and a lenticular cross-section (Figure 50h). The shallow corner notches produce an expanding stem with a straight base. The arrow point is a small triangular corner-notched form with a transverse fracture across the base (Figure 50i). The lateral margins of the blade exhibit delicate serrations. The projectile points from 140S104 are similar to forms recovered from the Plains Woodland component at the Cow-Killer site (Reynolds 1982) and indicate a Plains Woodland cultural affiliation.

The only marginally retouched tool from 140S104 is a disto-lateral scraper recovered from the upper 20 cm of Test Unit 1. This specimen was manufactured from a naturally backed flake. Steep retouch is present along the distal edge and one lateral edge. The remaining chipped stone tools consist of nine edge-modified flakes. None of the projectile points were thermally altered and only one edge-modified flake appears to have been heated.

Lithic manufacturing debris includes a total of three chunks, 31 flakes and 17 pieces of shatter. Approximately 29 percent of the debitage has been thermally altered. Primary and secondary decortication flakes, as well as bifacial thinning flakes and chips, are present. The remainder of the debris recovered from 140S104 consists of 28 burnt rocks and 10 pieces of unworked stone.

## Discussion and Recommendations

140S104 is a small, single component site situated on a terrace of Dragoon Creek. The ceramics and projectile points indicate that the site dates to the Plains Woodland period. The limited number of ceramics recovered precludes a precise assignment of cultural affiliation although the limited data would be consistent with the local Greenwood phase.

The limited tool inventory indicates that the site probably represents a hunting camp or a small residential camp. Test excavations demonstrate that undisturbed cultural deposits are present between 30 and 60 cm below surface. Activities at the site included hunting, light-duty cutting and scraping and food preparation. Analysis of

lithic manufacturing debris indicates that chipped stone tools were manufactured, maintained and modified at the site. Lithic raw materials include local gray to brown cherts of variable quality. The cortex present on the debitage indicate that small chert cobbles were obtained from alluvial sources. A high grade, blue-gray chert, used in making one dart point, was procured from a different source. The frequencies of primary and secondary decortication flakes indicate that tool maintenance and modification were more important than primary chipped stone tool manufacture at the site.

Reynolds (1979) has described two types of Plains Woodland Greenwood phase settlements. The first consists of small to moderate sized hamlets or villages located near perennial streams. These sites contain evidence of daub covered structures which were apparently occupied for some duration. The second type of settlement consists of smaller sites which were probably occupied for shorter periods. The smaller sites have not been adequately studied and the relationship between the two types of sites is unknown. 140S104 appears to represent one of the smaller Greenwood phase settlement types. If this interpretation is correct, then 140S104 is of considerable importance in characterizing the range of Plains Woodland Greenwood phase settlement patterns. Based on this consideration and given the general paucity of data recovered from controlled excavations of Plains Woodland sites within the Pomona Lake area, 140S104 is considered to be eligible for the National Register.

The site is located within the floodpool limits of the lake and is currently being impacted by leasing for agricultural purposes. The combination of plowing and occasional flooding threatens the site. It is recommended that the site be taken out of agricultural production and seeded in native grass. This action would stabilize the site's soil and prevent damage related to flooding.

## STREEDER SITE (140S105)

The Streeder site (140S105) is situated on an upland slope just southeast of a former meander of Dragoon Creek (Figure 53). This site's location was initially reported by Ben Streeder in 1982. Streeder had recovered a substantial collection of Pomona Ware ceramics and small arrow points which suggested the presence of a large Plains Village Pomona focus village or hamlet. However, the 1982 survey of the site vicinity along the multipurpose pool shoreline resulted in the recovery of 17 pieces of debitage along a 200 m area. The minimal content and eroded shoreline suggested that the site was largely destroyed.

The 1984 survey indicated that two artifact scatters were located along the 970 ft contour shoreline. A third scatter was reported by a local informant, however only one flake tool and one burnt rock were observed in this area by the investigators. The three artifact scatters have been designated as Localities I, II and III (Figure 53). Intensive survey of the draw-down zone between the 970 and 974 ft contours

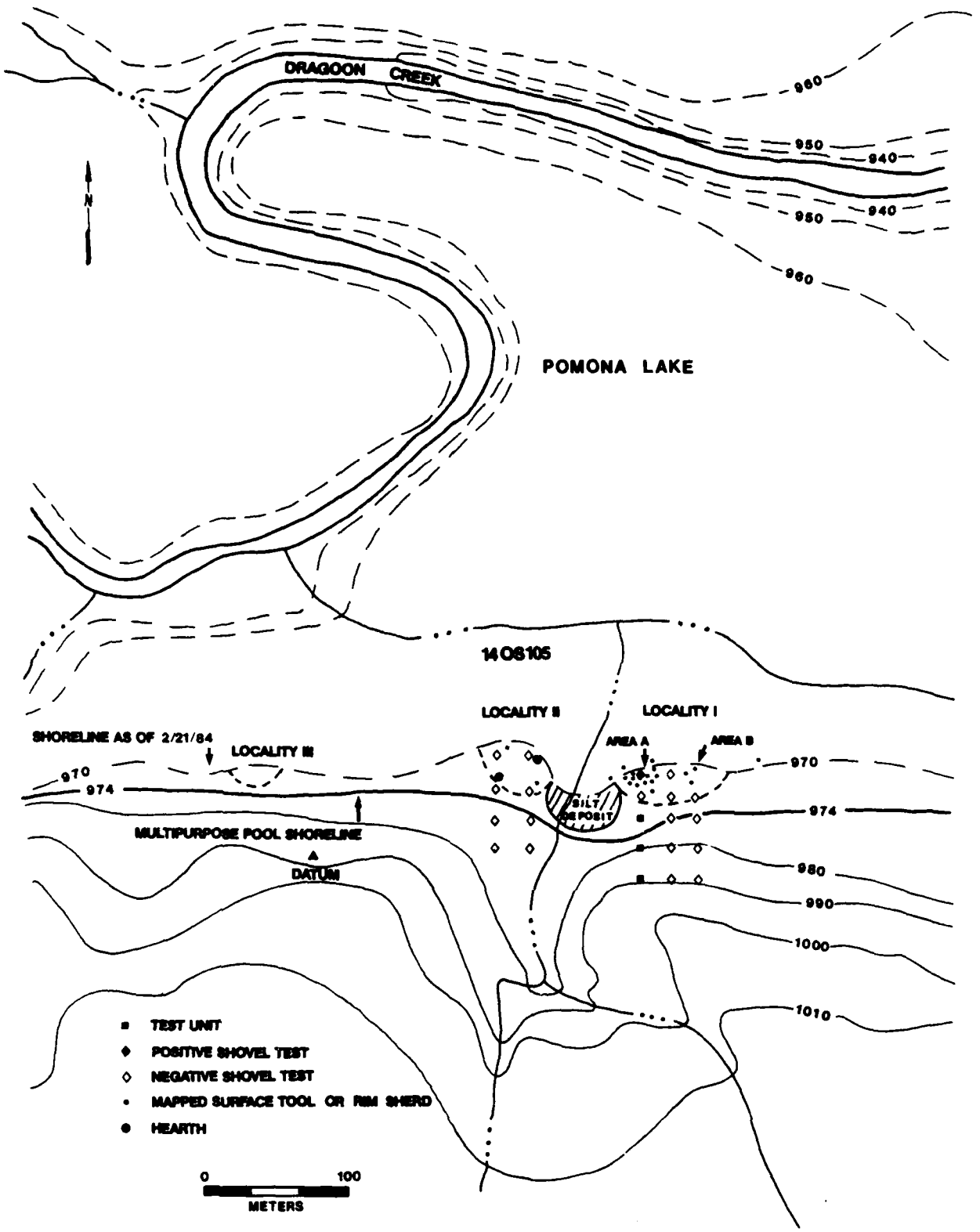



Figure 53. Location and plan view of test excavations at 140S105.

resulted in the recovery of only a few scattered sherds and pieces of debitage south of Localities I and II. Visibility in the draw-down zone was excellent, usually 100 percent (Figure 52). Visibility above the 974 ft contours ranged from 100 percent to less than 10 percent. No artifacts were observed above the 974 ft contour nor were any cultural materials recovered from shovel tests excavated above this elevation. These data indicate that the site, at least as it exists today, does not extend above the 972 ft contour.

Locality I, the largest and most concentrated debris scatter, is situated on a point just east of a silted-over intermittent stream (Figure 53). Artifacts were observed over an area 85 m long (east to west) and 20 m wide (north to south). Locality I was subdivided into two areas, A and B, based on the results of the surface mapping. Area A was 40 m in length and 13 m in width and contained a concentrated debris scatter. An artifact cluster 10 m in diameter near the center of Area A yielded 24 rim sherds, two arrow points, a metate and other classes of debris. A considerable amount of material in Area A extended north below the 970 ft contour into Pomona Lake. Area B is situated just east of Area A and contained a much lighter artifact density extending over an area 16 m in diameter.

Locality II of 140S105 is situated on a point on the west side of the silted-over intermittent stream which separates this light debris scatter from Locality I. Ceramics, debitage and burnt rock extended over a 30 by 35 m area at this locality. Two clusters of burnt rocks were observed at Locality II and appear to be the remains of disturbed hearths. No projectile points and only two rim sherds were recovered. Based on their proximity and the similarity in ceramics, Localities I and II may be a single occupation separated only by the intermittent stream. Locality III is located 190 m west of Locality II and had very few cultural materials. It appears to have been completely destroyed by wave action.

The 1984 test excavations commenced with the establishment of a site datum. U. S. Army Corps of Engineers bench mark R4 was utilized as the site permanent datum. The three localities and artifacts such as rim sherds and lithic tools were mapped. Other artifact classes such as body sherds and debitage were collected by locality and areas within the localities. Subsurface investigations at 140S105 consisted of the excavation of transects of shovel tests and test units at 25 m intervals along a north-south axis. Two transects consisting of 11 shovel tests and three test units were excavated at Locality I (Figure 53). Two transects consisting of eight shovel tests were excavated at Locality II. These excavations yielded no cultural material, except for the recovery of a sherd and a flake from the upper 10 cm of a shovel test in Area A at Locality I. The cultural materials at 140S105 appear to be located on the surface of a zone of unconsolidated dark gray brown silts 5 to 10 cm in thickness which is located over a truncated soil horizon. This dark silt appears to be the remains of a deflated, unconsolidated A Horizon which is susceptible to lateral movement through wave action.

## Soil Stratigraphy

140S105 is situated on sediments mapped by the Osage County Soil Survey as the Summit silty clay loam. This soil is a moderately drained slope soil situated on convex side slopes and generally below limestone outcrops. The upper profile consists of a black silty clay loam approximately 20 cm in thickness followed by a black, firm, silty clay loam horizon about 13 cm thick. The subsoil is a mottled, very firm silty clay approximately 100 cm thick which varies in color from very dark gray in the upper reaches to dark grayish brown in the lower reaches. A profile of Test Unit 1 is presented below. This test unit was situated approximately 25 m south of the 974 ft contour and evidences minimal or no soil erosion.

| | | |
|---|---|---|
| A | 0-20 cm | Very dark grayish brown (10YR3/2) silty clay loam; weak fine granular structure. |
| A/B | 20-40 cm | Very dark grayish brown (10YR3/2) clay loam; weak fine blocky structure. |
| IIB/C | 40-70+cm | Mottled grayish brown (10YR5/2) to brown (10YR4/3) silty clay; strong blocky structure. |

The profiles of Test Units 2 and 3, situated 25 and 50 m north of Test Unit 1, respectively, are quite different. These units are located within the draw-down zone between the 974 and 970 ft contours and exhibit nearly identical profile descriptions. The profile of Test Unit 3 consists of an upper A horizon overlying a lower IIB/C horizon.

| | | |
|---|---|---|
| A | 0-5 cm | Very dark grayish brown (10YR3/2) silty clay. |
| IIB/C | 5-60+cm | Mottled grayish brown (10YR3/2) to brown (10YR4/3), silty clay; strong blocky structure. |

A comparison of the two profiles indicates that the upper 35 to 40 cm of the A and A/B horizons have been scoured out by shoreline erosion. The very dark grayish brown silty clays which overlie the truncated IIB/C horizon lack cohesion and are easily transported by wave action across the lower, more resistant IIB/C horizon. Most of the cultural remains recovered from 140S105 are associated with the A/B horizon. Only larger chunks, burnt rock or other heavier lithics were observed to be located directly on the IIB/C horizon in areas where wave action had removed all traces of the remnant A/B horizon. Smaller artifacts appear to have been removed by wave action. No cultural materials were recovered from the IIB/C horizon during the test excavations.

## Artifact Assemblage

A total of 956 artifacts were recovered from 140S105 (Table 32). Included are ceramics, chipped stone tools, ground stone tools, lithic manufacturing debris, minerals, daub, burnt rock and an iron nail. The majority of this material (87 percent) was recovered from Area A of Locality I.

The ceramics include a total of 37 rim sherds and 476 body sherds. The majority of these (88 percent) were recovered from Area A at Locality I. Most of the sherds exhibited varying degrees of surface erosion, nevertheless, 35 of the 37 rims have identifiable surface treatments. The sample of rims can be subdivided into plain or smoothed surfaced, cordmarked, and knotted cordmarked. All of the rims are tempered with indurated clay or grog. A total of 13 rims have a smooth surface finish (Figure 54a and b) and range in thickness from 4 to 7 mm with a mean thickness of 5.3 mm. Seven have flattened lips and six are rounded. Three plain rims are decorated with finger-width size scallops. Interior and exterior colors range from yellowish red (5YR5/6) to dark gray (10YR4/1) with grays predominating. Core color ranges from light brown to dark gray. Vessel form could not be determined due to the small size of most of the specimens, however, their general morphology suggests that they are sections of small globular pots and bowls. Estimated orifice diameters range from 9 to 27 cm.

The 11 cordmarked rims comprise the second largest class of rims recovered from the site (Figure 54c). The rim form from these vessels is straight to slightly out-flaring with straight rims predominating. Cordmarks are relatively narrow and usually oriented vertical to the lip, although some cordmarks are oriented oblique to the lip. The cordmarking is smoothed over to varying degrees on many of the specimens. Rim thickness ranges from 4 to 8 mm with a mean thickness of 5.5 mm. Six of the specimens have rounded lips, while five are flattened. Interior and exterior colors range from gray (10YR6/1) to brown (10YR5/3) with pale brown shades predominating. Cores are gray to light brown. Vessel form cannot be determined with certainty although at least one specimen appears to be a fragment of a bowl and others appear to be sections of bowls or globular pots. Estimated vessel orifice diameters range from 10 cm to 24 cm.

The last class of rims defined in the assemblage consists of 11 specimens with knotted cordmarked impressions (Figure 54d-e). These rims range from 7 to 9 mm in thickness with a mean of 7.7 mm. Rim forms are straight to slightly outflaring. Eight of the specimens have rounded lips and three are flattened. The knots left deep depressions between the cordmarks producing a rough pitted surface texture. On several rims the knotted cordmarks have been smoothed or eroded. Knotted cordmarked impressions extend from the lip downward on some specimens and extend from the neck of the vessel on others. One knotted cordmarked specimen has decorations consisting of small punctates on the neck (Figure 54e). Exterior and interior colors range from pale brown (10YR6/3) to yellowish red (5YR5/8) with reddish yellow colors predominating. Sherd cores are yellowish red to gray in color with gray

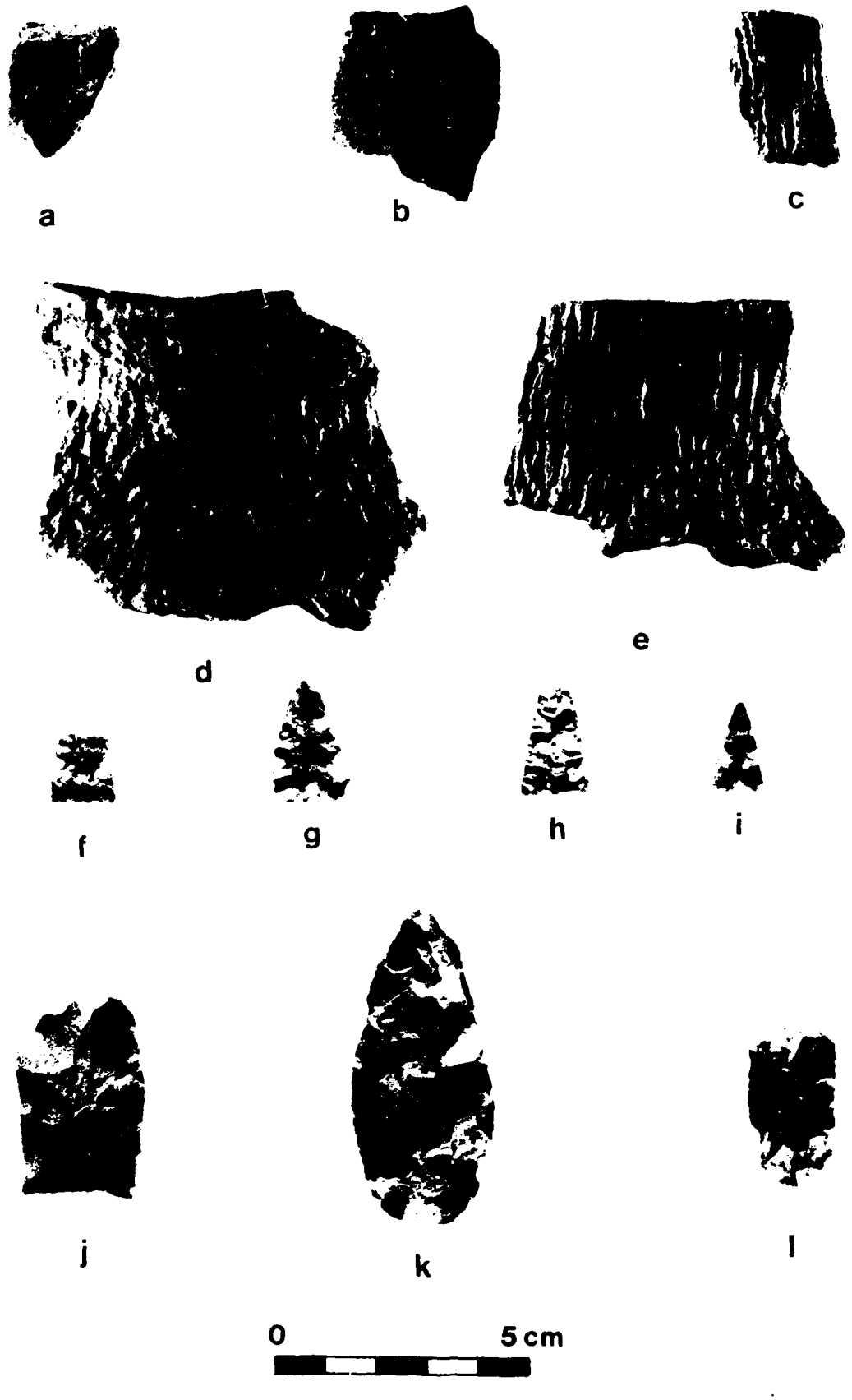



Figure 54. Artifacts from 140S15: a-b, Pomona Plain rim sherds; c, Pomona Cordmarked rim sherd; d-e, Pomona Cordmarked rim sherds with knotted impressed cords; f, Reed Side Notched point; g, Huffaker Notched point; h, Mississippi Triangular point; i, Cahokia Notched point; j, bifacial knife; k, bifacial blank; l, end scraper.

Table 32. Artifact assemblage from 140S105.

| | Locality I | | | Locality II | Locality III | Shovel Tests | General Surface | TOTAL |
|---|---|---|---|---|---|---|---|---|
| | Area A | Area A Cluster | Area B | | | | | |
| CERAMICS | | | | | | | | |
| Rim Sherds | 9 | 24 | 4 | | | | | 37 |
| Body Sherds | 207 | 211 | 38 | 19 | | 1 | | 476 |
| Total | 216 | 235 | 42 | 19 | | 1 | | 513 |
| CHIPPED STONE TOOLS | | | | | | | | |
| Projectile Points | 2 | 2 | | | | | | 4 |
| Bifacial Knives | 4 | 3 | 1 | | | | | 8 |
| Bifacial Blanks | 1 | 1 | | | | | 1 | 3 |
| Biface Fragments | 2 | 5 | | 2 | | | 1 | 10 |
| Scrapers | 7 | 10 | 1 | 6 | 1 | | | 25 |
| Flake Knives | 1 | 3 | | | | | | 4 |
| Edge-Modified Flakes | 10 | 64 | 5 | 3 | 1 | | 5 | 88 |
| Edge-Modified Chunks | | 1 | | | | | | 1 |
| Total | 27 | 89 | 7 | 11 | 2 | | 7 | 143 |

continued

Table 32 continued. Artifact assemblage from 140S105.

| | Locality I | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Area A | Area A Cluster | Area B | Locality II | Locality III | Shovel Tests | General Surface | TOTAL |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | |
| Cores | | 3 | | 1 | | | | 4 |
| Chunks | 16 | 10 | | 4 | | | | 30 |
| Flakes | 50 | 75 | 8 | 13 | 1 | 6 | | 153 |
| Shatter | 35 | 34 | | 2 | | 6 | | 77 |
| Total | 101 | 122 | 8 | 20 | 1 | 12 | | 264 |
| GROUND STONE | 2 | 2 | | 2 | | | | 6 |
| MINERALS | 2 | 2 | | | | | | 4 |
| BURNT ROCK | 3 | 7 | | | | | | 10 |
| DAUB | | 15 | | | | | | 15 |
| HISTORIC ARTIFACT | | 1 | | | | | | 1 |
| TOTAL | 351 | 473 | 57 | 52 | 3 | 13 | 7 | 956 |

being more common. The vessel form of the knotted cord impressed sherds appears to be that of globular pots, except for one sherd which may be a bowl fragment. Orifice diameter ranges from 7 to 28 cm.

The three classes of rims from 140S105 correspond to the previously defined Pomona focus ceramic types referred to as Pomona Cordmarked and Pomona Plain (Brogan 1982; Wilmeth 1970; and Schmits et al. 1980). Previously, cordmarked and knotted cordmarked sherds have been included within the same class, although Wilmeth (1970) noted the presence of a rougher knotted cordmarked surface treatment on a portion of the ceramics recovered from the Hart site. Brogan (1982) also notes the presence of closely spaced cordmarks and widely spaced cordmarks. Knotted cordmarked rim sherds from 140S105 have the widely spaced cord impressions. These sherds tend to be more robust than plain or cordmarked rims and appear to be sections of larger sized globular pots. Only one knotted cordmarked sherd appears to be a section of a bowl. The knotted cordmarked rims have a larger mean thickness of 7.7 mm compared to the mean thickness of 5.3 m for the plain surfaced rims and 5.5 mm for the cordmarked rims. The general morphology of the plain surfaced and cordmarked rims suggests vessel forms consisting of smaller bowls and globular pots.

In summary, three classes of rim sherds were defined on the basis of exterior surface treatment. Two classes, Pomona Cordmarked and Pomona Plain, are previously defined types. The knotted cordmarked class should be considered a variety of the Pomona Cordmarked type. Of the 35 rim sherds with recognizable exterior surface treatment, 22 (63 per cent) are Pomona Cordmarked and 13 (37 percent) are Pomona Plain. Knotted cordmarked accounts for 11 or 50 percent of the Pomona Cordmarked rims found at the site. The ceramic assemblage is typified by straight rim forms with outflaring and inflaring forms also present. Lip morphology is about evenly divided between rounded and flattened. Rim decoration is rare and is represented by three Pomona Plain rims with scalloped lips and one knotted cordmarked sherd with small punctates. Cordmarks, either simple or knotted, were applied vertically to the rim.

A total of 476 body sherds were recovered from 140S105. The majority of the body sherds (86 percent) were recovered from Area A of Locality I. Four types of exterior surface treatment were identified: plain, cordmarked, knotted cord impressed and incised cross-hatched. The latter forms rectangular to diamond shaped patterns. Cordmarks, whether simple or knotted, were applied vertically, except in three instances where cross-cording occurred. Plain sherds account for 5.5 percent, cordmarked for 69.5 percent, knotted cord impressed 24.6 for percent and incised cross-hatching for .4 percent of the assemblage. Noteworthy is the discrepancy between the percentages of plain body and plain rim sherds. Only 26 (5.5 percent) of the body sherds have a plain surface finish, while 13 (37 percent) of the rim sherds exhibit a plain surface finish. This discrepancy is probably a result of smoothing of the vessel orifice that occurred while the vessel was still in a plastic state. Brogan (1980) suggests that the Pomona Ware Plain results from the potters completely smoothing out the previously applied cordmarks.

Body sherds are tempered with indurated clay or grog and limestone. A third type of temper is suggested by the presence of slots and holes in some grog or indurated clay tempered sherds. These spaces may indicate that shell or limestone had been included in the paste and has since leached out. Only two sherds, both apparently from the same vessel, were tempered with crushed limestone. The body sherds exhibit the same general color ranges as those described for the rim sherds. Most of the body sherds are light brown to gray and the majority exhibit varying degrees of surface erosion.

A relatively large sample of chipped stone tools, including four projectile points, eight bifacial knives, three bifacial blanks and ten biface fragments, 25 scrapers, four flake knives and 89 pieces of edge-modified debitage, were collected from 140S105. All but one of the chipped stone tools were from the shoreline surface.

Four arrow points were recovered from Area A in Locality I. All conform to well defined types. The first is a small triangular side-notched point with a straight base and a transverse distal fracture (Figure 54f). It conforms well to the description of the Reed Side Notched arrow points (Chapman 1980). The second specimen is a double side-notched point with a single basal notch. The point has deep side notches just below the midsection of the blade. Two smaller side notches are located between the primary notches and the base (Figure 54g). This specimen conforms to the description of the Huffaker Notched type (Chapman 1980). The third specimen is a well made unnotched triangular arrow point (Figure 54h). The point is complete except for a small distal transverse fracture. This point fits the description for the Mississippi Triangular type (Chapman 1980). The last specimen consists of a small well made single side-notched point with a basal notch (Figure 54i). This specimen conforms well to the Cahokia Notched type (Chapman 1980). All of the arrow points are manufactured from a nonlocal white fossiliferous chert, only one of which has been heat treated.

The 21 bifaces were recovered from 140S105 including eight bifacial knives (Figure 54j), three bifacial blanks (Figure 54k) and ten biface fragments. The biface fragments appear to be sections of small knives and blanks. Six of the 21 bifaces appear to have been heated and seven were manufactured from a nonlocal white fossiliferous chert.

The scrapers from 140S105 include nine unifacial and 16 marginally retouched tools. Eight are unifacial end scrapers (Figure 54l). One specimen exhibits a worn pointed proximal working edge indicating additional use as a perforator. The remaining unifacial tool is a small side scraper. The 16 marginally retouched scrapers are all side scrapers. One specimen has a shallow notch indicating use as a spokeshave. The second specimen has a retouched projection and was used as a drill or perforator. Eleven of the 25 scrapers were manufactured from nonlocal white fossiliferous chert. Three of the specimens appear to have been heat treated.

Four flake knives were recovered from Area A. Three are manufactured from a nonlocal fossiliferous chert and appear to have been

heated. The remainder of the chipped stone tools from 140S105 consist of edge-modified debitage and include 88 edge-modified flakes and one edge-modified chunk. A total of 55 of the edge-modified tools were manufactured from nonlocal fossiliferous cherts. Nineteen of the specimens appear to have been heated.

Lithic manufacturing debris from 140S105 include 30 chunks, 153 flakes, four cores and 77 pieces of shatter. The cores and chunks consist of small cobbles of local brown cherts. Local chert comprises the raw material for 81 percent of the debitage, nonlocal white fossiliferous chert constitutes 16 percent of the debitage and nonlocal gray cherts make up the remaining 3 percent. Approximately 42 percent of the debitage retained various amounts of cortex and 14 percent appear to have been heated. The full range of flake types including primary and secondary decortication flakes, bifacial thinning flakes and chips are present in the assemblage.

Ground stone tools include five sandstone abraders and one piece of ground hematite. One abrader is a large thin tabloid which exhibits a beveled edge ground flat with areas of narrow grooves along the side. The other four abraders are all small fragments which exhibit one or more grooves. The grooves are quite narrow and probably resulted from the sharpening and smoothing of thin, cylindrical objects such as needles or awls. The small piece of hematite was ground on all sides, probably for production of pigment. Two pieces of limonite and two pieces of hematite were found at the site. Neither of the pieces of limonite appear to have been chipped or ground. One piece of hematite appears to be a flake removed from a larger hematite block. The second specimen consists of a small piece of shattered hematite.

Fifteen fragments of fired grass-impressed daub were recovered from 140S105. All of the daub was recovered from the artifact cluster in Area A. Other material recovered includes ten pieces of burnt rock and one iron nail. The burnt rock consists of small pieces of fired sandstone.

## Discussion and Recommendations

The survey and testing at 140S105 indicates that this site consists of a large Plains Village Pomona focus hamlet or base camp. The investigation resulted in the recovery of a substantial artifact assemblage from three localities at the site. Locality I is the largest and most concentrated scatter of debris. Locality II is a much lighter artifact scatter which may be part of Locality I. Locality III is a small scatter west of Locality II which has been almost entirely destroyed by lake related erosion. Locality I covers an area of at least 1700 sq m and extends for an unknown distance below the 970 ft contour into Pomona Lake. Locality I was subdivided into Areas A and B. The dense cluster of debris within Area A most likely represents the remains of a deflated structure. This interpretation is supported by the recovery of the grass-impressed daub from the concentration.

It is noteworthy that previously excavated and less disturbed Pomona focus structures have produced smaller ceramic assemblages than that recovered from Area A. Wilmeth (1970) recovered 101 Pomona Ware sherds in association with a structure at the Hart site from an excavated area of approximately 65 sq m. Brogan (1982) recovered 140 sherds out of a Pomona focus house at the Roth site within an excavated area of 142 sq m. A somewhat smaller Pomona Ware assemblage recovered from the Dead Hickory Tree site was associated with at least six different structures. These data suggest that the substantial artifact concentration from Area A may represent the remains of more than one structure. The stratigraphy at 140S105 suggests that the upper 35 to 50 cm of the soil profile has been deflated. The dense debris concentration could have resulted from the deflation of refuse pits associated with one or more structures. This process likely dispersed their contents and transported them downward to concentrations at more level elevations along with the remnant A and A/B soil horizons.

The artifact assemblage from 140S105 is large and consists of varied tool forms indicative of a broad range of activities expected at a hamlet or village. Tasks indicated by the assemblage suggest hunting and gathering, food preparation, hide preparation, chipped stone tool manufacture and maintenance. Horticulture is indicated by the recovery of small corncobs from the site by Streeder. Chipped stone tools manufactured from nonlocal white cherts and nonlocal gray cherts constitute a majority of the chipped stone tool assemblage. Nonlocal cherts constitute only 14 percent of the debitage with most of this debris being indicative of tool maintenance. The prehistoric occupants of the Streeder site appear to have preferred a nonlocal white fossiliferous chert for tool manufacture. This chert is similar to Burlington Formation cherts found in west central Missouri. The presence of these cherts suggest that the inhabitants of the Streeder site either participated in a regional exchange network or that they actually visited quarry sites in Missouri. In either case, primary modification of the nonlocal white and gray cherts occurred at a different locale. The small pebble and cobble sized pieces of coarse brown chert are available in the site vicinity and were initially worked at the site.

No organics suitable for radiocarbon dating were found, and even if present, would very likely have been contaminated by recent lake deposited organics. Radiocarbon dates from other Pomona focus sites tend to cluster from the late tenth to seventeenth centuries A.D. (Schmits et al. 1980). The recovery of only small arrow points from the Streeder site and the absence of Scallorn arrow points and larger dart points suggests that 140S105 probably dates to the later segment of the Pomona occupation in eastern Kansas.

In summary, the Streeder site is a deflated Plains Village Pomona focus village or hamlet. The cultural materials at this site have been mixed and possibly transported over some distance. No features remain between the 974 and 970 ft contours. These conditions limit this site's potential to produce important data and 140S105 no longer appears to meet the requirements for eligibility to the National Register. Significant data could be present below the 970 ft contour and future

wave action could expose more artifact concentrations. Therefore, it is recommended that 140S105 be monitored during future draw-downs of Pomona Lake.

## 140S106

This site consists of a light scatter of lithics and historic artifacts located along the shoreline of a peninsula or point on the eastern side of Pomona Lake. The site is on an upland sandstone spur 300 m southeast of the confluence of Valley Brook and Wolf Creek (Figure 55). When tested, the site was located in a fallow field covered with small cockleburs. The surface visibility ranged from 100 percent along the shoreline to less than 10 percent in the brushy interior (Figure 56).

Mapping of all surface artifacts in 1982 resulted in the recovery of prehistoric cultural materials for a distance of 160 m along the western shore and 180 m along the southern shore. Four concentrations of tools were observed with occasional artifacts being found over a surface area of 14,925 sq m. To determine the location of concentrations of artifacts in areas where the surface visibility was less than 30 percent, a systematic shovel cut testing program was initiated during the 1982 investigations. A grid was established and a total of 86 shovel cuts were excavated at 20 m intervals. These investigations failed to delineate any concentrations of artifacts. Therefore, two transects consisting of seven one by one m test units located at 25 m intervals were excavated parallel to the shoreline. Eight additional test units were excavated in areas where concentrations of surface tools were defined (Figure 55).

The 1984 survey of the terrain between the 974 and 970 ft contour interval at 140S106 indicated that the western and southwestern sides of the site had been greatly deflated. One area of freshly deposited silt was noted along the south-central portion of the site. Very few artifacts of any type were located in the draw-down zone. The 1984 investigations also included the excavation of two transects of shovel tests at 20 m intervals and the reopening of Test Unit 2 (Figure 55). One additional shovel test was excavated west of Test Unit 2 to obtain soil-geomorphic information. One of the transects consisting of three shovel tests was excavated south of Test Unit 13 cross-cutting the exposed silt deposits.

The 1982-1984 investigations at 140S106 indicated that the bulk of the prehistoric cultural materials are located along the shoreline and are generally restricted to the upper 20 cm of the soil profile. Test Units 2 and 11 contained minimal amounts of cultural debris extending to a depth of 40 cm below surface.

The historic component of 140S106 consists of a poured concrete foundation and numerous historic artifacts dating to the late nineteenth and early twentieth centuries. This material is associated with a farmstead which was razed during the construction of Pomona Lake. A

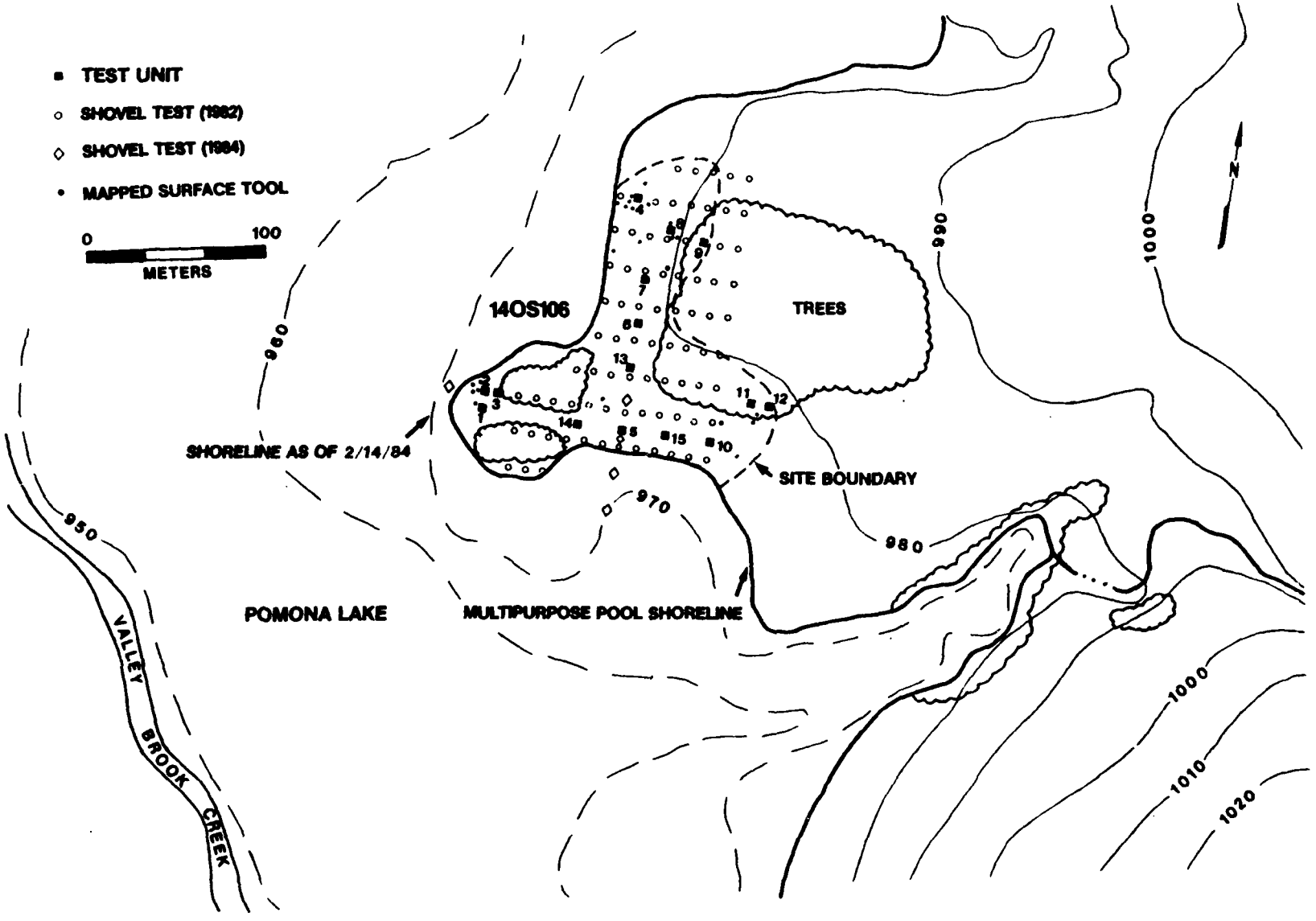



Figure 55. Location and plan view of 1982 and 1984 test excavations of 14OS106.



Figure 56. General views of 140S106 and 140S108. Shoreline surface collections in progress at 140S106, looking south (upper). Test excavations in progress at 140S108, looking north (lower).

search of historic documents including Government Land Office records, various historical atlases, plat books, and local histories was made in order to identify the historic component at 140S106. The earliest structure at this local is listed in the 1879 Atlas of Osage County as belonging to N. Schamle. The 1899 and 1918 atlases show the same data. The U. S. Army Corps of Engineers project maps list five structures in the vicinity of 140S106, while the Corps' real estate tract map lists four structures at this locale. The partial remains of only one of these buildings was located. The Corps purchased this property from Archie A. Martin et al. In summary, the historic component of 140S106 presumably consists of the Schamle-Martin farmstead. The first structures were built sometime before 1879 and several additional outbuildings were added until the property was vacated in 1961.

## Soil Stratigraphy

140S106 is situated on an upland sandstone bedrock spur and on soils mapped by Osage County Soil Survey as the Lula silt loam. This soil is typically situated on gently sloping ridge tops above limestone outcrops. The profile of Test Unit 2 which is located on the sandstone spur is presented below:

| | | |
|---|---|---|
| A | 0-21 cm | Very dark grayish brown (10YR3/2) sandy loam. |
| B/C | 21-41 cm | Dark yellowish brown (10YR3/5) sandy clay loam. |
| C | 41-53+cm | Yellowish brown (10YR5/8) fine sand. |

Shovel Test A, located 20 m west of Test Unit 2, encountered only C horizon sands. The soil profile data demonstrate that within this short distance at least 40 cm of the A and B/C horizons have been scoured out.

The shovel tests located south of Test Unit 5, which crosscut the Lula silt loam soils and the fresh silt deposits in the deflated zone, encountered only a dark reddish brown, silty clay Bt horizon below the unconsolidated silts. The A and A/B horizons have been scoured out by shoreline erosion. The cultural materials at the site are restricted to the A and A/B horizons, indicating that any cultural materials located in the draw-down zone are not in situ. Above the 974 ft contour cultural materials are primarily restricted to the old cultivation zone.

The 1984 investigations of the draw-down zone at 140S106 indicated that the terrain between the 974 and 970 ft contours has been heavily impacted by shoreline erosion, especially in the vicinity of the sandstone spur. One process which has contributed to this area's erosion was observed during the 1984 survey. Winter ice had been deposited by north winds to a height of a meter or more along the southwestern and western sides of the site. Mass movement of soil and rock occurred during the spring thaw as the ice melted and slid towards

the lake. In moving, the ice left rock and sand piled up along the shoreline.

## Artifact Assemblage

A total of 405 artifacts were recovered during the 1982-1984 investigations at 140S106. This material includes five ceramic sherds, 55 chipped stone tools, 192 pieces of lithic manufacturing debris, 70 historic artifacts and 83 burnt rocks and unworked stones (Table 33).

The five body sherds include one from the surface and four from Test Unit 2. One specimen is a smoothed-over cordmarked clay or grog tempered sherd which is brown in color and 9 mm thick (Figure 50h). Two sherds from a different vessel from Test Unit 2 have a distinctly different surface texture although they are also cordmarked (Figure 50k). Both are brown in color, 6 mm thick and are tempered with indurated clay or shale. The remaining two sherds are small eroded fragments, both of which are tempered with indurated clay or shale. These sherds are similar to Pomona Ware ceramics although the small sample and fragmentary condition preclude a definite classification.

The lithic assemblage from 140S106 includes four projectile points, one bifacial knife, six biface fragments, 11 scrapers, and 33 edge-modified flakes and chunks. The projectile points constitute a homogeneous group of four unnotched, triangular arrow points similar to those designated as Mississippi Triangular by Chapman (1980) (Figure 50l-o). These specimens are common Plains Village period artifacts. One of the points was from Test Unit 13, while the other three are from the shoreline surface.

The knife fragment exhibits attritional wear resulting from use as a cutting implement. The six biface fragments appear to be sections of bifacial knives or blanks.

The 11 scrapers include a steeply retouched biface fragment, two unifacial end scrapers and eight flake scrapers. One of the unifacial end scrapers is made from a triangular flake blank that exhibits steep angle marginal retouch along the distal end and some lateral edge modification, possibly for hafting purposes. Four of the flake scrapers exhibit attritional wear on both lateral edges indicating secondary usage as knives. Another specimen exhibits concave marginal retouch on one lateral edge and convex attritional wear on the opposite edge. This additional retouch and wear indicates secondary usage both as a spokeshave and as a flake knife. A total of 28 edge-modified flakes and five edge-modified chunks were recovered. These tools were used with little or no previous modification in light-duty scraping, spokeshaving and cutting tasks.

Approximately 31 percent of the tools from 140S106 have been thermally altered. Raw materials from which these tools were made include local gray and brown cherts. A fine grained blue-gray chert was selected for the manufacture of blade tools.

The lithic manufacturing debris from 140S106 consists of five chunks, 138 flakes and 49 pieces of shatter. Approximately 31 percent of the chunks and flakes have been heated. The full range of flake types including primary and secondary decortication flakes, bifacial

Table 33. Artifact assemblage from 140S106.

| | Test Units | | | | | | | | | | | Shovel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 6 | 7 | 9 | 10 | 11 | 12 | 13 | Tests | Surface | TOTAL |
| CERAMICS | | 4 | | | | | | | | | | | 1 | 5 |
| CHIPPED STONE TOOLS | | | | | | | | | | | | | | |
| Projectile Points | | | | | | | | | | | 1 | | 3 | 4 |
| Bifacial Knife | | | | | | | | | | | | | 1 | 1 |
| Biface Fragments | | | | | | | | | | | | | 6 | 6 |
| Scrapers | | | | | | | | | 1 | 1 | | | 9 | 11 |
| Edge-Modified Flakes | | | | | | | | | 1 | 1 | | | 26 | 28 |
| Edge-Modified Chunks | | 1 | | | | | | | | | | | 4 | 5 |
| Total | | 1 | | | | | | | 2 | 2 | 1 | | 49 | 55 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | | | | | |
| Chunks | | | | 1 | | | | | | | | | 4 | 5 |
| Flakes | 3 | 2 | | | 1 | | | | 7 | 8 | 1 | 3 | 113 | 138 |
| Shatter | | 4 | 2 | 2 | | 1 | | | 3 | 3 | | | 34 | 49 |
| Total | 3 | 6 | 2 | 3 | 1 | 1 | | | 10 | 11 | 1 | 3 | 151 | 192 |
| BURNT ROCK | | 2 | | 5 | | | | | | | | | 2 | 9 |
| UNWORKED STONE | | 32 | 4 | 12 | 3 | 11 | 1 | 10 | | | | | 1 | 74 |
| HISTORIC ARTIFACTS | | | | | | | | | | | | | | |
| Metal | | 1 | | | 1 | | | | | | | | | 2 |
| Glass | | 2 | 1 | 4 | | 1 | | | | | | 1 | 18 | 27 |
| Ceramics | | 1 | | | 1 | | | | | | | | 39 | 41 |
| Total | | 4 | 1 | 4 | 2 | 1 | | | | | | 1 | 57 | 70 |
| TOTAL | 3 | 49 | 7 | 24 | 6 | 13 | 1 | 10 | 12 | 13 | 2 | 4 | 261 | 405 |

thinning flakes and pressure flakes are present. The overall frequencies of these types indicate an emphasis on stone tool maintenance and modification rather than manufacture at the site.

A total of 70 historic artifacts were recovered from the Historic component at 140S106 in the vicinity of Test Unit 2. Included are metal, glass, ceramics, crockery and porcelain insulators. This historic debris dates to the late nineteenth and early twentieth century and is from a very disturbed context.

### Discussion and Recommendations

140S106 is a multicomponent site with Plains Village and Historic components present. Diagnostic artifacts indicate that the prehistoric component is affiliated with the Pomona focus. The highest concentration of prehistoric debris was observed along the shoreline, however, small amounts of cultural debris were located inland. Test excavations indicate that the cultural materials are restricted primarily to the upper 20 cm of the soil profile. Two sherds were recovered from 38 cm below the surface in Test Unit 2. One edge-modified flake and one piece of shatter were located between 35 and 40 cm below surface in Test Unit 11.

Analysis of the artifact assemblage indicates that a variety of activities were conducted at the site including hunting and butchering, hide preparation, various light-duty cutting and scraping tasks, as well as the manufacture, maintenance and modification of chipped stone tools. Lithic raw material was collected from local gravel deposits, as well as from more distant and presumably bedrock sources. Approximately one third of the lithic assemblage exhibits characteristics of thermal alteration.

The projectile points and ceramics from 140S106 indicate that this occupation is related to the Plains Village Pomona focus. The size of this site and the light artifact densities observed are interpreted to indicate that 140S106 is a residential camp which was not intensively utilized or occupied.

The results of the 1982 and 1984 investigations have shown that the prehistoric cultural materials are restricted to the plowzone and are most concentrated along the highly eroded shoreline. The lack of subsurface integrity severely limits the research potential of 140S106. Based on the lack of subsurface integrity, both the prehistoric and historic components of 140S106 are not recommended to be eligible for the National Register.

## 140S107

This site consists of a very light lithic scatter located on the floodplain of Valley Brook Creek (Figure 49). The site is situated on

soils mapped as the Summit complex at a point on the west bank of Valley Brook. At the time of the investigations, the site was covered with grass and small willows and the surface visibility varied from 100 percent along the shoreline to less than 10 percent in the grass and willow scrub. The investigations consisted of an intensive survey of all open ground surfaces. A total of four artifacts were recovered as a result of the reconnaissance. This material was located on the extreme tip of this point of land. Due to the poor visibility inland, shovel cuts were located at 10 m grid intervals in the site areas. The excavation of 30 shovel cuts failed to locate any additional cultural materials.

The cultural debris recovered from 140S107 consists of the distal fragment of a large projectile point or knife, two flakes and one core fragment. The distal fragment and both flakes have been heated.

140S107 consists of a very light lithic scatter located on a point of land just west of Valley Brook. Four artifacts were found along the shore at the very tip of this point. The systematic excavation of shovel cuts on a 10 m grid system failed to recover any additional materials. Based on these data, 140S107 represents a limited-use site. The temporal and cultural affiliation of 140S107 cannot be determined from these data. Based on the minimal artifact content and lack of subsurface integrity, 140S107 does not meet the requirements for eligibility to the National Register.

## 140S108

This site consists of a light to moderate density lithic scatter located on upland terrain overlooking the former channel of Dragoon Creek. The site is now situated on a peninsula of land formed by the inundation of the confluence of an intermittent stream with a large meander of Dragoon Creek (Figure 57). When these investigations were conducted, the site area was covered with cockleburs. Ground surface visibility ranged from 100 percent along the shoreline to less than 20 percent inland (Figure 56). Shoreline erosion had deflated the soil profile for a distance of up to 20 m inland leaving artifacts distributed on the surface of the bedrock and truncated soil horizons.

Mapping of surface artifacts along the shoreline delineated a lithic scatter extending from the tip of the peninsula 85 m along the western shore and 70 m along the eastern shore. Based on the small size of the shoreline scatter, a 10 m grid interval for shovel cut testing was selected to define the inland boundaries of the site. A total of 29 shovel cuts were excavated.

Results of the shoreline survey and systematic shovel testing indicated that 140S108 covers a surface area of approximately 130 by 95 m (Figure 57). The 1984 draw-down survey of the terrain adjacent to the site between the 974 and 970 ft contours did not locate any additional cultural remains. Surface visibility in the draw-down zone was 100 percent.

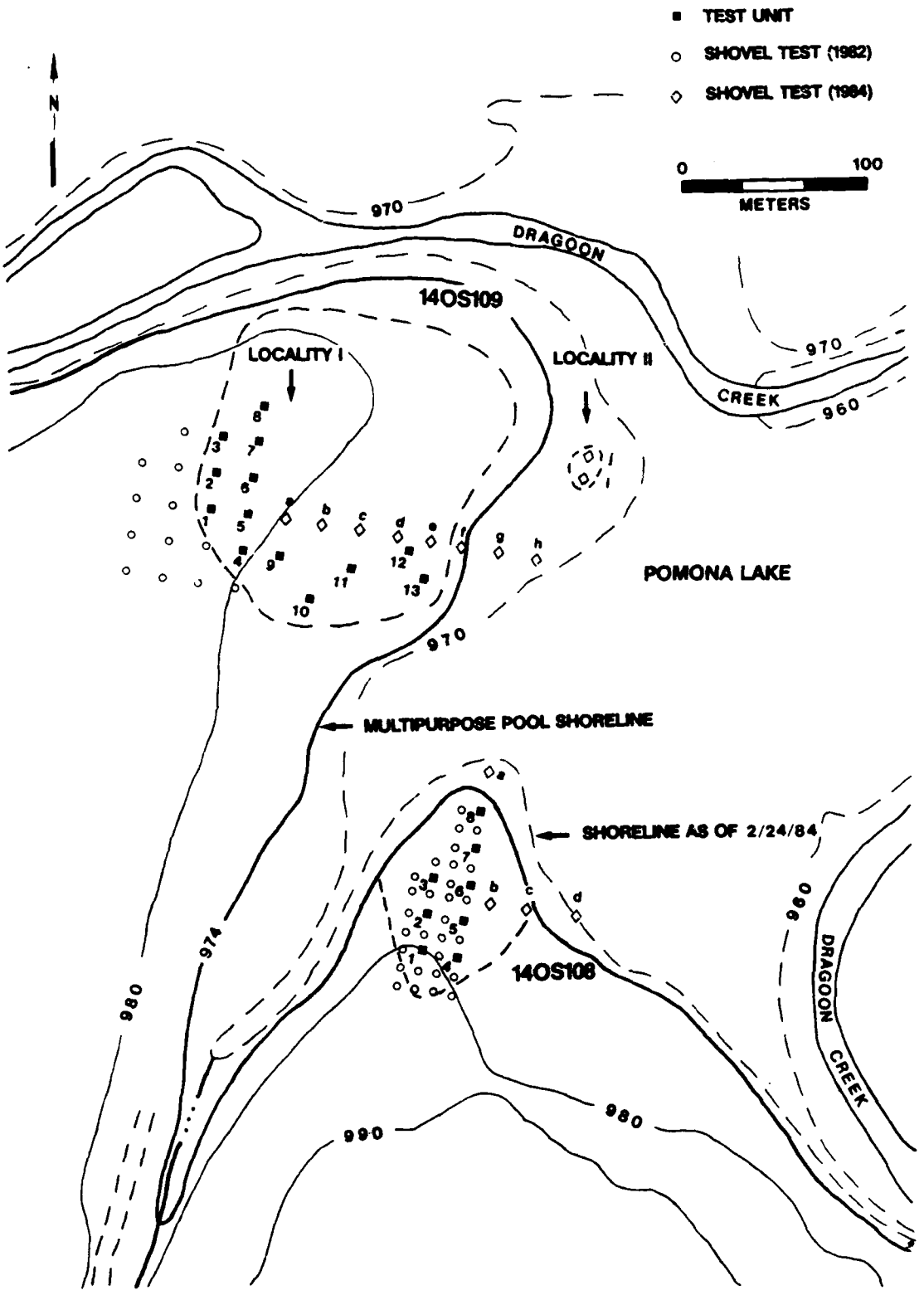



Figure 57. Location and plan view of 1982 and 1984 test excavations at 140S108 and 14CS109.

Two transects consisting of eight one by one m test units were excavated at 20 m intervals parallel to the shoreline and inland from the disturbed shoreline area. Results of these excavations indicate that cultural materials are present in limited amounts in all of the test units and that some undisturbed cultural materials are present between 20 and 40 cm below surface. Concentrations of grass-impressed daub recovered from Test Unit 5 indicate the presence of a probable structure in the vicinity of this unit. In 1984 two transects of shovel cuts which crosscut the draw-down zone and higher elevations were excavated for purposes of obtaining soil-geomorphic data. Test Units 6, 7 and 8 were reopened for the same purposes. No artifacts were recovered from the two shovel cut transects.

## Soil Stratigraphy

140S108 is located on soils mapped by the Osage County Soil Survey as the Clareson-Eram complex. These soils are situated on the convex tops and sides of ridges on uplands and are so intermixed that the two soils are mapped as a unit. The examination and description of a transect of test unit profiles at 140S108 determined that this site is situated on the Clareson silty clay loam. The Clareson soil is typified by very dark brown, silty clay loam topsoil approximately 20 cm in thickness followed by a dark brown, friable silty clay loam also approximately 20 cm thick. The subsoil is a dark reddish brown, firm, very flaggy silty clay. Limestone bedrock is usually encountered at a depth of 60 cm. Profiles were made of Test Units 6, 7 and 8 to document the effects of intermittent inundation on the site. The descriptions of Test Units 6 and 8 are as follows:

Test Unit 6:

| | | |
|---|---|---|
| Ap | 0-20 cm | Very dark grayish brown (10YR3/2) silt loam; medium granular structure. |
| B/A | 20-40 cm | Dark yellowish brown (10YR4/4) clay loam; medium fine sub-angular blocky structure. |

Test Unit 8:

| | | |
|---|---|---|
| Ap | 0-5 cm | Very dark grayish brown (10YR3/2) silt loam; medium granular structure. |
| B/A | 5-20 cm | Dark yellowish brown (10YR3/3) silty loam; medium granular structure. |
| Bt | 20-38 cm | Dark reddish brown (5YR3/3) silty clay loam; medium blocky structure. Numerous flagstones present. |

These profiles demonstrate that at least 15 cm of A horizon have been eroded from the Clareson soil over the 40 m which separates Test Units 6 and 8. Test Unit 6 is situated at approximately the 977 ft contour, while Test Unit 8 is situated at the 975 ft contour. North of Test Unit 8 the erosion is much more severe exposing the Bt horizon in some places. Between the 974 and 972 ft contours no trace of the soil remains, leaving only exposed bedrock. Therefore, between the 972 ft contour and the 975 ft contour, at least 15 cm and as much as 40 cm of the soil deposits have been scoured out by past lake level fluctuations.

Below the 972 ft contour, nearly level mud flats extended for varying distances to the 970 ft contour. Shovel tests determined that dark silts containing organic plant remains extended to a depth of 20 to 30 cm below surface. These deposits appear to be the remains of a saturated old A horizon.

## Artifact Assemblage

A total of 212 artifacts were recovered as a result of the investigations conducted at 140S108. This collection includes 36 chipped stone tools, 123 pieces of lithic manufacturing debris, four minerals, 28 pieces of daub, ten burnt rocks and 11 pieces of miscellaneous unworked chert and stone (Table 34).

The chipped stone tools consist of ten bifaces, nine scrapers and 17 edge-modified flakes and chunks. Approximately 42 percent of the chipped stone tools have been thermally altered. The bifacial tools include three blanks and seven biface fragments. The biface fragments include two distal fragments, four midsections and one proximal fragment. One distal fragment is a thin, triangular specimen which has been unidirectionally resharpened on one lateral edge. The other distal end fragment is an unthinned biface, possibly a blank or preform which has been utilized as a knife.

Five of the scrapers are unifaces. Two are thumbnail scrapers and two are subtriangular side scrapers which exhibit heavy step fracture wear on all lateral edges. The fifth unifacial scraper is a finely worked disto-lateral scraper made from a blade (Figure 58a). The marginally retouched scrapers include one large disto-lateral scraper manufactured from a blade, two scrapers with notches suitable for use as spokeshaves and one end scraper. Edge-modified debitage includes 16 edge-modified flakes and one edge-modified chunk.

The 123 pieces of lithic manufacturing debris include two cores, 12 chunks, 49 flakes and 60 pieces of shatter. The cores are small nodules of chert derived from gravel deposits. One core has had flakes removed from its lateral edges bidirectionally. Thick cortex is present on both ends and the chert is a light brown in color. The second core is composed of similar chert with flakes having been detached along two surfaces. Cortex is present along an end and side of this piece. Approximately 32 percent of the cores, chunks and flakes have been heated.

Hematite, limonite, daub, burnt rock, and unworked chert and stone constitute the balance of the artifact inventory from this site. Two pieces of hematite are small and unmodified. One fragment has been ground on all surfaces, probably for the production of red pigment. The piece of limonite is unmodified. The 28 pieces of daub recovered from Test Unit 5 have grass impressions. The remainder of the 21 burnt rocks

Table 34. Artifact assemblage from 140S108.

| | Test Units | | | | | | | | Shovel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Tests | Surface | TOTAL |
| CHIPPED STONE TOOLS | | | | | | | | | | | |
| Bifacial Blanks | | | | 1 | | | | | | 2 | 3 |
| Biface Fragments | | | | | | | | | | 7 | 7 |
| Scrapers | | | | | | | | | | 9 | 9 |
| Edge-Modified Flakes | | | | | | | | | | 16 | 16 |
| Edge-Modified Chunk | | | | | | | | | | 1 | 1 |
| Total | | | | 1 | | | | | | 35 | 36 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | | |
| Cores | | | | | | | | | | 2 | 2 |
| Chunks | | | | | | | | | | 12 | 12 |
| Flakes | | | 1 | | | | 1 | 1 | 2 | 44 | 49 |
| Shatter | 1 | 2 | | 5 | 3 | 2 | 8 | 2 | 2 | 35 | 60 |
| Total | 1 | 2 | 1 | 5 | 3 | 2 | 9 | 3 | 4 | 93 | 123 |
| MINERALS | | 1 | | | 1 | | 1 | 1 | | | 4 |
| DAUB | | | | | 28 | | | | | | 28 |
| BURNT ROCK | 2 | | | | | | | | 2 | 6 | 10 |
| UNWORKED STONE | | 1 | | | 5 | 2 | 1 | | 2 | | 11 |
| TOTAL | 3 | 4 | 1 | 6 | 37 | 4 | 11 | 4 | 8 | 134 | 212 |




Figure 58. Artifacts from 140S108, 140S109, 140S350 and 140S367: a, scraper from 140S108; b, body sherd from Locality I at 140S109; c-d, rim sherd and body sherd from Locality II at 140S109; e, projectile point from 140S109; f, bifacial knife from 140S109; g, body sherd from 140S350; h-i, projectile point and scraper from 140S350; j-k, projectile points from 140S367.

and unworked chert and unworked stone were recovered primarily from the test units.

## Discussion and Recommendations

140S108 is located on the Clareson-Eram soil complex adjacent to Dragoon Creek, just east of an intermittent stream. Test excavations indicate the site is a single component occupation covering an area of 8102 sq m. Cultural materials were found from the surface to a maximum depth of 40 cm with the bulk of materials located in the upper 30 cm of the soil profile.

The analysis of the artifact assemblage indicates that activities related to a variety of light-duty cutting and scraping tasks were conducted at this site. The relatively large number of implements utilized in hide preparation indicate a heavy emphasis on this activity. The recovery of cores and lithic manufacturing debris indicates that on-site lithic tool manufacturing occurred, however, the overall emphasis appears to have been on tool maintenance and modification. The types of cortex observed demonstrate that locally available cherts were utilized. Lower frequencies of fine grained blue-gray cherts which lack cortex are also present, indicating that the primary modification of this material occurred at another location.

The probability that a habitational structure is located in the vicinity of Test Unit 5 is indicated by the recovery of grass-impressed daub from this unit. The lack of temporally diagnostic artifacts, such as ceramics or projectile points, makes the exact cultural and temporal affiliation of this site difficult to determine. The style of the end scrapers suggests a Plains Village or Plains Woodland period occupation. The proximity of this site to 140S109, a Plains Village occupation, may be a further indication of such an affiliation for 140S108.

The 1984 cultural resources survey determined that no additional significant cultural resources are located on the terrain between the 974 and 970 ft contours at 140S108. The excavation of shovel tests and test units documented the loss of various soil horizons between the 972 and 975 ft contours. The erosional processes are ongoing and related to lake level fluctuations. Pomona Lake has inundated terrain at elevations up to the 990 ft contour. Lake level fluctuations above the 977 ft contour threaten the in situ cultural deposits which remain at the site. A large portion of 140S108 has already been destroyed by impoundment related erosion, and the remainder of the site is in imminent danger of destruction from the same forces. Test excavations indicate that some undisturbed subsurface deposits remain in place. Based on the probability that a structure and intact features may be present at this site and given the paucity of data from excavated sites at Pomona Lake, 140S108 has the potential to contribute significant information on the prehistory of the area. With these considerations in mind, 140S108 is recommended to be eligible for nomination to the National Register.

Shoreline erosion at 140S108 is an ongoing process which will eventually destroy the entire site. Based on this consideration, it is recommended that a limited data recovery program be conducted at the site at the earliest possible date. The data recovery program should include small block excavations in the vicinity of Test Unit 5 and additional test excavations to delineate other areas of intact features or structures. Collection of samples for radiometric or thermoluminescence dating should also be made.

## 140S109

140S109 is a moderately dense lithic scatter located on upland terrain overlooking the former floodplain of Dragoon Creek (Figure 57). The site is situated on a divide formed by the inundation of Dragoon Creek and an intermittent stream. This divide forms a point or peninsula extending out into Pomona Lake. When the 1982 investigations were conducted, the site was covered with cockleburs. The ground surface visibility ranged from 100 percent along the shoreline to less than 10 percent further inland. Shoreline erosion had severely deflated the site area for distances of greater than 40 m inland, depositing artifacts on the surface of a truncated soil horizon. Mapping of surface artifacts delineated a scatter of cultural materials extending for a distance of 360 m along the shoreline. The shoreline survey, in conjunction with the systematic excavation of shovel cuts and test units on a 20 m grid interval inland from the deflated zone, resulted in the definition of a site area of 250 by 160 m.

In 1982 a total of 13 one by one m test units were excavated primarily in the undisturbed inland areas of the site. Results of these subsurface investigations indicated that cultural materials were located primarily in the upper 20 cm of the soil profile though occasional materials were recovered to a depth of 50 cm below surface. One undisturbed feature was located in Test Unit 5. The 1984 investigations included the mapping and collection of a subarea of the site, designated as Locality II as well as test excavations (Figure 59). Subsurface investigations at Locality I included the reopening of Test Units 1 and 5 and the excavation of one transect of eight shovel tests at 20 m intervals east of Test Unit 5. These excavations were conducted to obtain soil-geomorphic data to document the effects of inundation on the site. Two shovel tests were also excavated within Locality II and found to be sterile.

### Soil Stratigraphy

The soils at 140S109 are mapped by the Osage County Soil Survey as belonging to the Eram-Lula complex. On-site inspection determined that Locality I is situated in Lula silt loam while Locality II, located on the T-0 terrace of Dragoon Creek, is on soils associated with the Osage soil series.

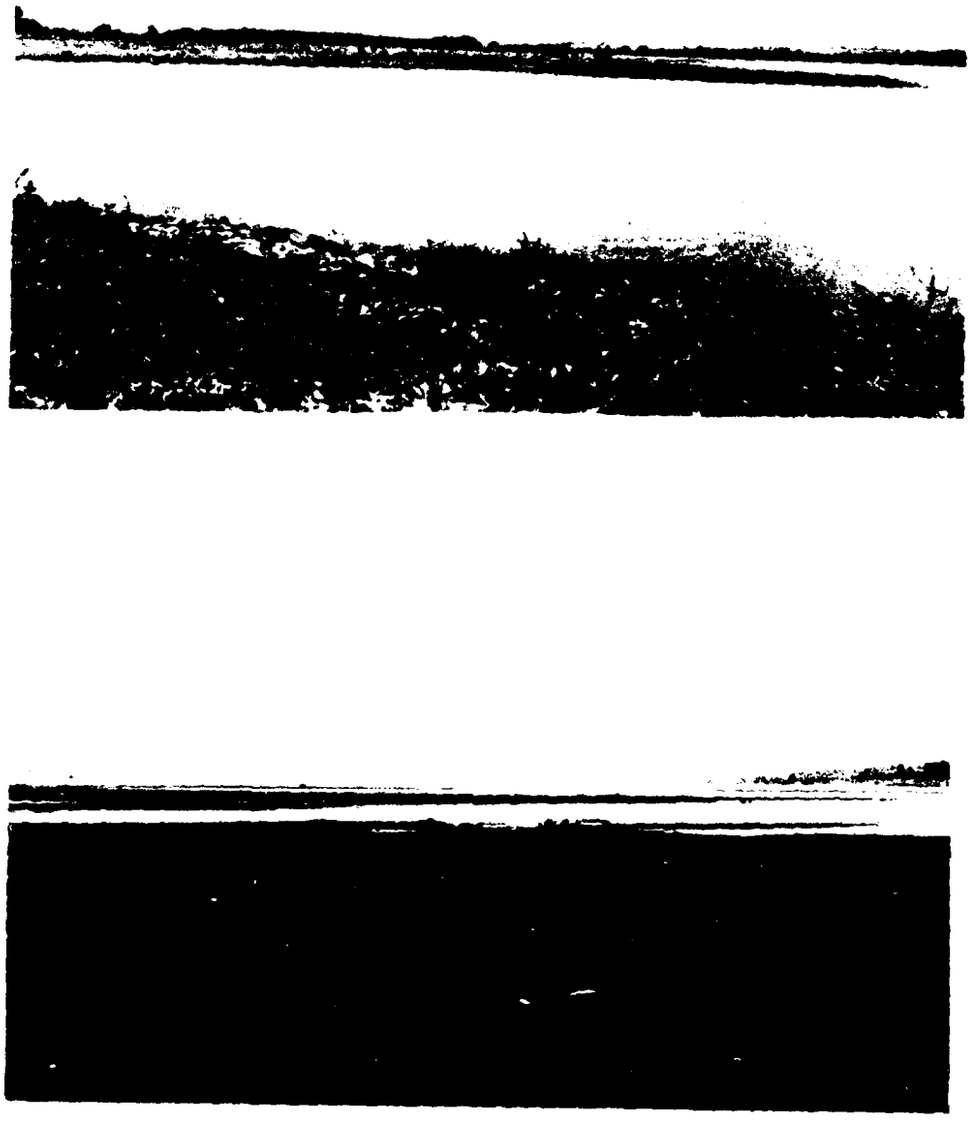


Figure 59. General views of 140S109; looking north at Locality I (upper) and east at Locality II (lower).

The Lula silt loam is typified by a dark grayish brown silt loam topsoil approximately 20 cm thick, followed by a dark reddish brown silty clay loam approximately 15 cm thick. The subsoil consists of a firm silty clay loam varying in color from dark reddish brown to dark mottled yellowish red which is usually 80 cm thick and overlies limestone bedrock. The profile exposed by the east-west transect of test units and shovel cuts documents the extent of lake erosion along the shoreline. The profile descriptions of Test Unit 1 and Shovel Test B are presented below.

Test Unit 1:

| | | |
|---|---|---|
| Ap | 0-15 cm | Very dark grayish brown (10YR3/2) silt loam; medium granular structure. |
| A/B | 15-28 cm | Very dark grayish brown (10YR3/2) silty clay loam; weak subangular blocky structure. |
| B/A | 28-37 cm | Dark reddish brown (5YR3/3) silty clay loam; weak subangular blocky structure. |
| B | 37-45 cm | Mottled yellowish red (5YR5/8) to dark reddish brown (5YR3/4) silty clay loam; moderate subangular blocky structure. |

Shovel Test B:

| | | |
|---|---|---|
| A/B | 0-8 cm | Very dark grayish brown (10YR3/2) silt loam; medium granular structure. |
| B/A | 8-30+cm | Dark reddish brown (5YR3/3) silty clay loam; weak subangular blocky structure. |

A comparison of the two profiles demonstrates that at least 28 cm of the soil profile has been scoured out over the 60 m distance between the two profiles. Erosion is progressively worse along the transect as one approaches the 974 ft contour shoreline. The underlying bedrock is exposed near Shovel Test G. In situ artifacts at the site are located in the upper A/B soil horizon. Cultural debris east of Shovel Test B is deflated. Past lake erosion ranges from the removal of the upper Ap and most of the A/B horizon near Shovel Test A to the entire soil profile near Shovel Test G. This process has resulted in the deposition of artifacts on truncated soil horizons or directly on the underlying bedrock.

## Cultural Feature

Feature 1 was a basin-shaped pit encountered in the southwestern corner of Test Unit 5 at Locality I. The feature consisted of a dark stain in a lighter soil matrix first observed 20 cm below surface. The portion of the pit excavated in Test Unit 5 measured 45 by 60 cm and extended to a maximum depth of 49 cm below surface. The feature extended into the southern and western walls of the test unit so the overall size and shape of the feature remain undetermined, although the cross-section of the feature suggests a basin shape. The feature fill consisted of organically stained soil and charcoal. Occasional bits of burnt clay and lithics were also recovered in the feature fill. The high density of charcoal and relative paucity of burnt earth is interpreted as subsequent pit fill rather than in situ burning. All of the feature fill was retained for flotation. A charcoal sample for radiometric dating was collected.

## Radiocarbon Date

The charcoal sample collected from Feature 1 was submitted to Beta Analytic Inc. for radiocarbon dating. This sample yielded a date of 740±70 years B.P. or A.D. 1210±70. This date indicates that the occupation of 140S109 falls within the Plains Village period.

## Artifact Assemblage

A total of 665 artifacts were recovered from the 1982-1984 investigations at 140S109. Included are nine ceramic sherds, 105 chipped stone tools, 508 pieces of lithic manufacturing debris, one ground stone tool, one mineral, 28 burnt rocks and 13 unworked stones (Table 35). A total of 647 artifacts were recovered from Locality I and 18 were from Locality II.

One smoothed-over cordmarked sand tempered body sherd was recovered from the surface of Locality I (Figure 58b). The exterior surface is brown in color and the core and interior surface are dark brown to black. This specimen is 7 mm thick and is similar to some of the Greenwood phase ceramics from the Cow-Killer site (Reynolds 1982). One small plain surfaced rim sherd and seven cordmarked body sherds were recovered from Locality II (Figure 58c-d). These ceramics are a consistent grayish brown in color and are tempered with indurated clay. They are similar to Pomona ware ceramics associated with the Plains Village period.

The chipped stone tool assemblage consists of one projectile point, one bifacial knife, five bifacial blanks, 14 biface fragments, seven scrapers, five flake knives, one perforator and 71 edge-modified flakes and chunks. Approximately 40 percent of the chipped stone tools appear to have been thermally altered. The projectile point is a corner-notched arrow point similar to the Scallorn type (Figure 58e). This specimen has a robust biconvex cross-section and was manufactured from a thick flake blank. Scallorn points are generally associated with

Table 35. Artifact assemblage from 140S109.

| | Locality I | | | | | | | | | | | | | | Locality II | SITE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Test Units | | | | | | | | | | | Shovel | | | | |
| | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 16 | Tests | Surface | Total | Surface | TOTAL |
| CERAMICS | | | | | | | | | | | | | | 1 | 1 | 8 | 9 |
| CHIPPED STONE TOOLS | | | | | | | | | | | | | | | | | |
| Projectile Point | | | | | | | | | | | | | | 1 | 1 | | 1 |
| Bifacial Knives | | | | | | | | | | | | | | | | 1 | 1 |
| Bifacial Blanks | | | | | | | | | | | | | | 5 | 5 | | 5 |
| Biface Fragments | | | | | | | | | | | | | | 14 | 14 | | 14 |
| Scrapers | | | | | | | | | | | | | | 7 | 7 | | 7 |
| Flake Knives | | | | 1 | | | | | | | | | | 4 | 5 | | 5 |
| Perforator | | | | | | | | | | | | | | 1 | 1 | | 1 |
| Edge-Modified Flakes | 1 | 1 | | 2 | 1 | | | 1 | | | | | | 54 | 60 | 1 | 61 |
| Edge-Modified Chunks | | | | | | | | | | | | | | 10 | 10 | | 10 |
| Total | 1 | 1 | | 3 | 1 | | | 1 | | | | | | 96 | 103 | 2 | 105 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | | | | | | | | | |
| Cores | | | | | | | | | | | | | | 4 | 4 | | 4 |
| Chunks | | | | | | | | | | | | 1 | | 12 | 13 | 3 | 16 |
| Flakes | | 5 | | 4 | 8 | | | 2 | 1 | 1 | 4 | 4 | | 289 | 318 | 5 | 323 |
| Shatter | 1 | 6 | | 1 | 9 | 2 | | 1 | 1 | 1 | 2 | 8 | 2 | 131 | 165 | | 165 |
| Total | 1 | 11 | | 5 | 17 | 2 | | 3 | 2 | 2 | 6 | 13 | 2 | 436 | 500 | 8 | 508 |

continued

Table 35 continued. Artifact assemblage from 140S109.

| | Locality I | | | | | | | | | | | | | | Locality II | SITE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Test Units | | | | | | | | | | | | Shovel | | | |
| | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 16 | Tests | Surface | Total | Surface | TOTAL |
| GROUND STONE | | | | | | | | | | | | | | 1 | 1 | | 1 |
| MINERALS | | | | | | | | | | | | | | 1 | 1 | | 1 |
| BURNT ROCK | 6 | 5 | 1 | 1 | | 4 | | 2 | | 3 | 2 | 3 | | 1 | 28 | | 28 |
| UNWORKED STONE | | | 1 | | 3 | | | | | | 6 | | 3 | | 13 | | 13 |
| TOTAL | 8 | 17 | 2 | 9 | 21 | 6 | 4 | 2 | 2 | 5 | 14 | 16 | 5 | 536 | 647 | 18 | 665 |

the Plains Woodland period, although they have been recovered from some Plains Village Pomona sites.

One large bifacial knife with beveled edges was recovered from Locality II (Figure 58f). The knife has transverse fractures near its proximal and distal ends. Five light-duty bifacial blanks were also recovered. These specimens were not completed due to flaws in the raw material or were apparently fractured during the reduction sequence. Fourteen biface fragments are insufficiently complete for classification but appear to be pieces of bifacial knives or projectile points.

The scrapers from 140S109 consist entirely of marginally retouched tools including one large disto-lateral scraper, one side scraper, and five end scrapers. All of the scrapers were manufactured from flake blanks and exhibit marginal retouch which results in a steep planoclinal edge shape.

Five flake knives and one flake perforator constitute the remaining marginally retouched tool types. Two of the flake knives exhibit bidirectionally retouched cutting edges, two specimens have unidirectional denticulate saw-like edges, and one knife has unidirectional retouch on both lateral edges and exhibits heavy attritional wear. The perforator was manufactured from the proximal end of a small flake and has a unidirectionally retouched pointed projection. A total of 61 edge-modified flakes and ten edge-modified chunks were recovered.

Lithic manufacturing debris from 140S109 includes four cores, 16 chunks, 323 flakes and 165 pieces of shatter. Approximately 41 percent of this material appears to have been thermally altered. The full range of flake types, such as primary and secondary decortication flakes, bifacial thinning flakes and pressure flakes were observed in the assemblage.

One ground stone abrader was recovered from the surface of 140S109. This specimen is a cobble-sized piece of sandstone which exhibits a shallow concave depression on one surface. One sub-triangular piece of ground hematite was recovered from the surface. A total of 28 burnt rocks and 13 pieces of unworked limestone were recovered. All but four pieces of this material were recovered from the test unit excavations.

## Discussion and Recommendations

140S109 is a large Plains Village Pomona focus site overlooking the former channel of Dragoon Creek. Investigations conducted in 1982 and 1984 resulted in the delineation of two localities. Locality I is situated on an upland point and Locality II is on the floodplain of Dragoon Creek. The site covers an area of approximately 19,400 sq m. Results of the test excavations demonstrate that cultural materials are located primarily in the upper 20 cm of the soil profile although deposits extend to a depth of at least 40 cm below surface in the vicinity of Test Unit 5 at Locality I. An intact feature consisting of a trash filled basin-shaped pit was encountered in Test Unit 5. The

undisturbed cultural deposits at Locality I are in the A and A/B soil horizons of the Eram-Lula soil complex. The small scatter at Locality II appears to be associated with an old cultivation zone (Ap horizon) of the Osage silty clay.

The artifact assemblage from Locality I indicates that a wide range of activities took place including the manufacture, modification, and maintenance of chipped stone tools, hunting and butchering, hide preparation, various light and heavy-duty cutting and scraping tasks and food preparation. The large size of this site coupled with the variety of activities performed indicates that Locality I represents a hamlet or residential camp. Basin-shaped storage pits are often associated with habitational structures and there is a high probability that a habitational structure is located in the vicinity of Test Unit 5.

Locality II appears to be a small limited activity area based on the tools and the small number of ceramics present. The large bifacial knife and edge-modified debitage indicates that activities associated with butchering and light-duty cutting and scraping took place there. The sherds recovered from Locality II likely represent only one or two vessels. Locality II could represent a larger activity area which is primarily buried. Shovel tests, however, did not result in the recovery of any subsurface cultural materials.

The only temporally diagnostic artifacts from Locality I consist of one Scallorn arrow point and one smoothed-over cordmarked sand tempered body sherd. These artifacts could be associated with either the Plains Woodland or Plains Village periods. However, the date of A.D. 1210±70 obtained from Feature 1 indicates that Locality I represents a Plains Village component probably associated with the Pomona focus. The one rim sherd and seven body sherds recovered from Locality II are similar to Pomona Ware and tend to strengthen the assignment of 140S109 to the Pomona focus of the Plains Village period.

140S109 has already been damaged by erosion. The 1984 investigations indicate that the A and A/B horizons which contain intact cultural deposits have been completely scoured out east of Shovel Test B, the result that all of the cultural deposits below the 980 ft contour at Locality I have been deflated. Areas with intact soil profiles and associated cultural materials are restricted to above the 980 ft contour. The depth of erosion increases from west to east until bedrock is exposed near Shovel Test F. Locality II, which is located within the normal multipurpose pool level, appears to be less drastically impacted by lake related erosion, being situated well away from most shoreline wave action.

The 1982-1984 investigations at 140S109 demonstrate that a sizeable portion of Locality I retains subsurface integrity and features. Only one Pomona focus site has been excavated in the Pomona Lake project area. Based on the presence of intact subsurface remains and the minimal data on Pomona focus communities within this river valley, 140S109 is recommended to be eligible for the National Register.

Locality I of 140S109 is located just west of 140S108. Due to the highly threatened condition of both sites resulting from shoreline erosion of Pomona Lake, it is recommended that limited data recovery programs be conducted at both sites at the earliest possible time. Block excavations should be conducted in the vicinity of Test Unit 5 at 140S109. The mechanical removal of the plowzone from other portions of the site to reveal additional features or structures is also recommended. Locality II at 140S109 has a limited content and is apparently not being heavily impacted by inundation. Consequently, it is recommended that Locality II be monitored during future draw-downs of Pomona Lake to determine if larger and denser artifact concentrations are being exposed.

## 140S110

This site consists of two historic foundation walls located on upland terrain on the eastern side of Pomona Lake (Figure 49). The site is situated on soils mapped as the Lula complex and was covered with brush, so the surface visibility varied from 0 to 30 percent. Three small trees are growing within the foundation walls. The walls are constructed of uncut native limestone. No mortar was observed. The walls vary in height from 30 to 50 cm. The western wall extends five m to the south of its juncture with the northern wall. A small, low portion of the southern wall extends for a distance of one m towards the east. A concentration of limestone rubble along the southern edge of the site probably represents the remains of the rest of the southern wall. The eastern wall, if it existed, is now totally destroyed. No artifacts were located within or near the remains of this structure. The only cultural material observed besides the foundation wall consisted of a roll of rusty barbed wire located within the walls.

The examination of various historical atlases, Government Land Office records, county histories and plat books provided additional data regarding 140S110. The patent on the land was issued on June 1, 1872 when William Reynolds purchased all of the southeast quarter section. On July 11, 1873, Alvin Hamilton purchased all of the quarter section from Reynolds. Alvin Hamilton sold this property in 1877 to W. H. Hamilton and then repurchased the land on February 6, 1884, selling the east half of the quarter section to Valney Hamilton and the west half to W. H. Hamilton on the same date.

The 1879 Atlas of Osage County shows a house in the vicinity of 140S110 and listed the owners as "W.J.J.S" (sic) and V. W. Hamilton. These data indicate that 140S110 may represent a portion of the Hamilton house, or more likely an associated outbuilding. The Hamiltons are listed as owners of this structure in the 1899 and 1918 county atlases. Segment B of the final Pomona Lake Project Tract Map lists this property as being purchased from Harold H. Wischropp and shows three structures at this location, while the U. S. Army Corps of Engineer's Pomona Dam and Reservoir contour map shows a total of seven structures, five of which are very small, at this location. All of these structures were apparently razed during the construction of Pomona Lake.

These data indicate that the Hamiltons constructed a house at the location of 140S110 sometime between 1872 and 1878. By 1963 as many as seven structures were in existence at this locale. 140S110 represents the remains of one of these buildings. The lack of domestic artifacts within or near the foundation walls of 140S110 indicates that this structure was a small shed or lean-to associated with the Hamilton-Wischropp farmstead. The fact that the farmstead has been largely destroyed indicates that any historic remains are in a highly disturbed condition. Furthermore, the disturbed remains of an agricultural outbuilding are unlikely to constitute a significant cultural resource. Therefore, 140S110 is not recommended to be eligible for the National Register.

## 140S111

This site consists of a light lithic scatter situated on a terrace between the inundated channels of Valley Brook and Wolf Creek some 335 m north of the confluence of these two streams (Figure 60). At the time of the investigations, the site was covered with cockleburs with surface visibility ranging from 0 to 20 percent, except along the shoreline where surface visibility approached 100 percent. Lithic debris was observed for a distance of 180 m along the shoreline.

A systematic shovel cut testing program designed to delineate the horizontal extent of 140S111 was conducted at 20 m grid intervals (Figure 61). A total of 64 shovel cuts were excavated, none of which produced cultural debris. Three test unit transects consisting of 13 one by one m test units located at 20 m intervals were placed parallel to the most concentrated artifact concentrations observed along the shoreline. The test excavations indicated that cultural deposits were restricted to the upper 20 cm of the soil profile. Small amounts of cultural materials were recovered from Test Units 3, 5, 6, 7 and 8. The terrain between the 974 and 970 ft contours adjacent to 140S111 was investigated in 1984 and found to be highly eroded although a small centrally located silt deposit was observed. A single shovel test was excavated in the silted area to determine if the silts represented a remnant soil horizon or recent deposition. The silts were determined to be thin unconsolidated deposits directly overlying a truncated A/B or B horizon. The deflated condition of this terrain made further subsurface investigations unnecessary. No cultural materials were recovered from the shovel test or surface of the area investigated in 1984.

### Soil Stratigraphy

140S111 is located on soils mapped by the Osage County Soil Survey as the Summit silty clay loam. Summit series soils are described as deep, moderately well drained soils formed over weathered shale on uplands. They are typified by a black top soil or A horizon 20 cm thick. This is followed by an A/B horizon 13 cm thick and a Bt horizon 45 cm in thickness. The shovel test excavated in the fresh silt

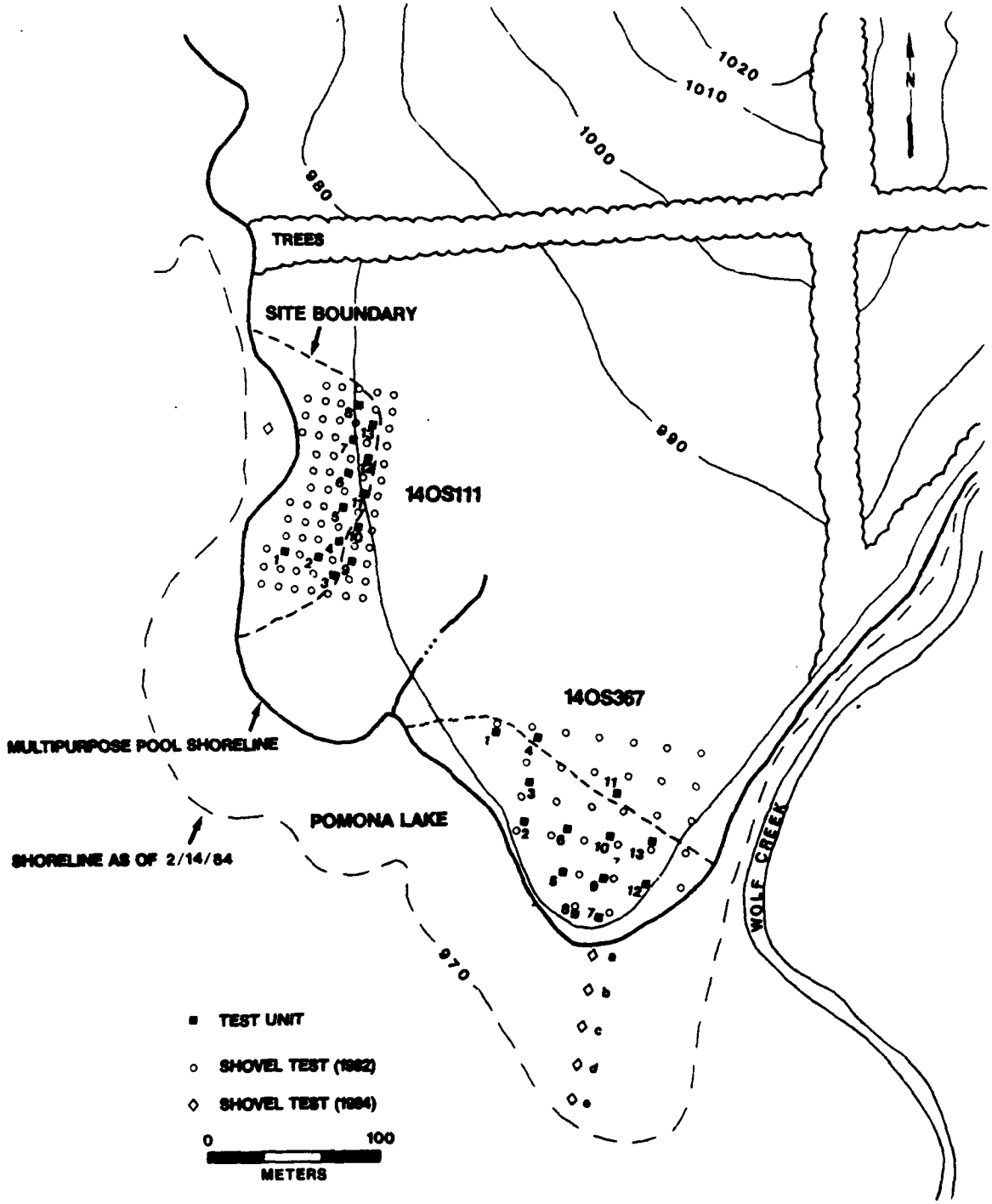



Figure 60. Location and plan view of 1982 and 1984 test excavations at 140S111 and 140S367.



Figure 61. General views of 140S111 and 140S367. Shovel testing in progress at 140S111 (upper). Test excavations in progress at 140S367 (lower).

deposits in the central portion of the site indicated that unconsolidated silts directly overlay the lower A/B or upper Bt horizons suggesting that the upper 25 to 30 cm of the soil profile including all of the Ap and most of the A/B horizon has been scoured out in the draw-down zone. The 1982 testing had determined that the cultural materials were primarily restricted to the Ap horizon. The 1984 survey demonstrates that no in situ cultural remains are located in the draw-down zone.

## Artifact Assemblage

A total of 195 artifacts were recovered during the inventory and evaluation of 140S111. This debris includes one ceramic sherd, 21 chipped stone tools, 164 pieces of lithic manufacturing debris, three burnt rocks and six unworked stones (Table 36). The body sherd from 140S111 is a small eroded specimen grayish brown in color with a dark brown to black core. The sherd is grit tempered and is of insufficient size to determine vessel form or size.

The chipped stone tools include two bifacial blanks, one biface fragment, three scrapers, 14 edge-modified flakes and one edge-modified chunk. Approximately 28 percent of the chipped stone tools have been thermally altered.

The bifacial blanks are fragments of subrectangular preforms. The third biface is a fragment of a preform or knife reworked into a perforator or graver. All of the bifaces are surface finds.

The scrapers are marginally retouched tools and include one end scraper and two side scrapers manufactured from small flakes. One specimen exhibits straight, unidirectional marginal retouch along one lateral edge, while the other specimen was retouched along both lateral margins producing a convex working edge on one side and a straight working edge on the opposite side.

Thirteen edge-modified flakes and the edge-modified chunk were from the surface. One edge-modified flake was recovered from Test Unit 5. Eight of the modified flakes were manufactured from secondary decortication flakes. One modified flake was made from a primary decortication flake and exhibits a retouched projection suitable for perforating.

A total of 164 pieces of lithic manufacturing debris were recovered from 140S111. Seven chunks, 115 flakes and 42 pieces of shatter are included. Approximately 41 percent of this material has been thermally altered. All of the lithic manufacturing debris, except for five pieces was recovered from the surface along the shoreline. The balance of the assemblage is composed of three burnt rocks and six pieces of unworked stone.

Table 36. Artifact assemblage from 140S111.

| | Test Units | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3 | 5 | 6 | 7 | 8 | 11 | Surface | TOTAL |
| CERAMIC | | | | | | | 1 | 1 |
| CHIPPED STONE TOOLS | | | | | | | | |
| Bifacial Blanks | | | | | | | 2 | 2 |
| Biface Fragments | | | | | | | 1 | 1 |
| Scrapers | | | | | | | 3 | 3 |
| Edge-Modified Flakes | | 1 | | | | | 13 | 14 |
| Edge-Modified Chunks | | | | | | | 1 | 1 |
| Total | | 1 | | | | | 20 | 21 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | |
| Chunks | | | | | | | 7 | 7 |
| Flakes | | | 1 | 1 | 1 | | 112 | 115 |
| Shatter | 1 | | | 1 | | | 40 | 42 |
| Total | 1 | | 1 | 2 | 1 | | 159 | 164 |
| BURNT ROCK | | | | | 2 | 1 | | 3 |
| UNWORKED STONE | | | | | | | 6 | 6 |
| TOTAL | 1 | 1 | 1 | 2 | 3 | 1 | 186 | 195 |

## Discussion and Recommendations

The 1982 and 1984 investigations at 140S111 resulted in the delineation of a site covering an area of 6644 sq m as well as the recovery of an artifact assemblage consisting of 195 pieces of debris. Cultural materials were observed and collected along the shoreline and to a limited extent inland. Extensive subsurface tests consisting of shovel cuts and test unit excavations resulted in the recovery of only six artifacts. These materials were restricted to the upper 20 cm of soil. The 1982 investigations determined that the cultural materials above the 974 ft contour are associated with the Ap horizon. No artifacts were located in the 1984 draw-down zone. Shovel tests indicated that 25 to 30 cm of soil including the Ap and most of the A/B

horizon have been scoured out between the 974 and 970 ft contours. Consequently, if 140S111 extended to the 970 ft contour, it has been scoured out and its contents transported to a lower elevation. Subsurface investigations demonstrate that there is little cultural material located inland from the 974 ft contour.

Analysis of the artifact assemblage indicates that the activities at this site centered around light-duty cutting and scraping tasks. Food preparation or storage is indicated by the presence of ceramics. Most of the lithic manufacturing debris present is indicative of tool maintenance and modification. The cherts utilized are generally local brown to gray cherts of variable quality. Some of this chert was derived from alluvial gravels. A higher quality blue-gray chert was present in low frequencies. The only temporally diagnostic artifact recovered is the grit tempered body sherd which suggests a Plains Woodland cultural affiliation. The proximity of 140S111 to 140S367, a Plains Village site, however, may indicate that these two sites are related and the site could date to the Plains Village period. The limited tool inventory and lack of midden development indicates that 140S111 represents a briefly occupied residential camp or limited-use site.

Based on the lack of subsurface integrity and the limited artifact content, 140S111 has minimal potential to add significant information on the prehistory of east central Kansas. The site is not recommended to be eligible for the National Register.

## 140S350

This previously recorded site was not relocated during the 1982 shoreline survey. An intensive search of the site vicinity along the 970 ft contour in 1984 resulted in the location of a small light scatter of lithics and ceramics in association with a burnt rock hearth. This light scatter of cultural material was located 150 m south of the reported site location. The site is located approximately 25 m east of the inundated channel of Hundred and Ten Mile Creek (Figure 62). 140S350 is situated on the floodplain of Hundred and Ten Mile Creek near its juncture with a higher terrace. The 1984 investigations commenced with the establishment of a datum placed along a section line fence. An east-west baseline was then established from which the 970 ft shoreline, the 974 ft shoreline and the archaeological remains were mapped. Flagging of the observed artifacts indicated that the site covers an area of 30 by 40 m. Cultural debris was densest near the hearth and along the 970 ft contour. One transect of two test units and two shovel tests, was excavated at a 25 m interval (Figure 62). These excavations proved to be sterile, except for the recovery of one flake from the upper 10 cm of Shovel Test B.

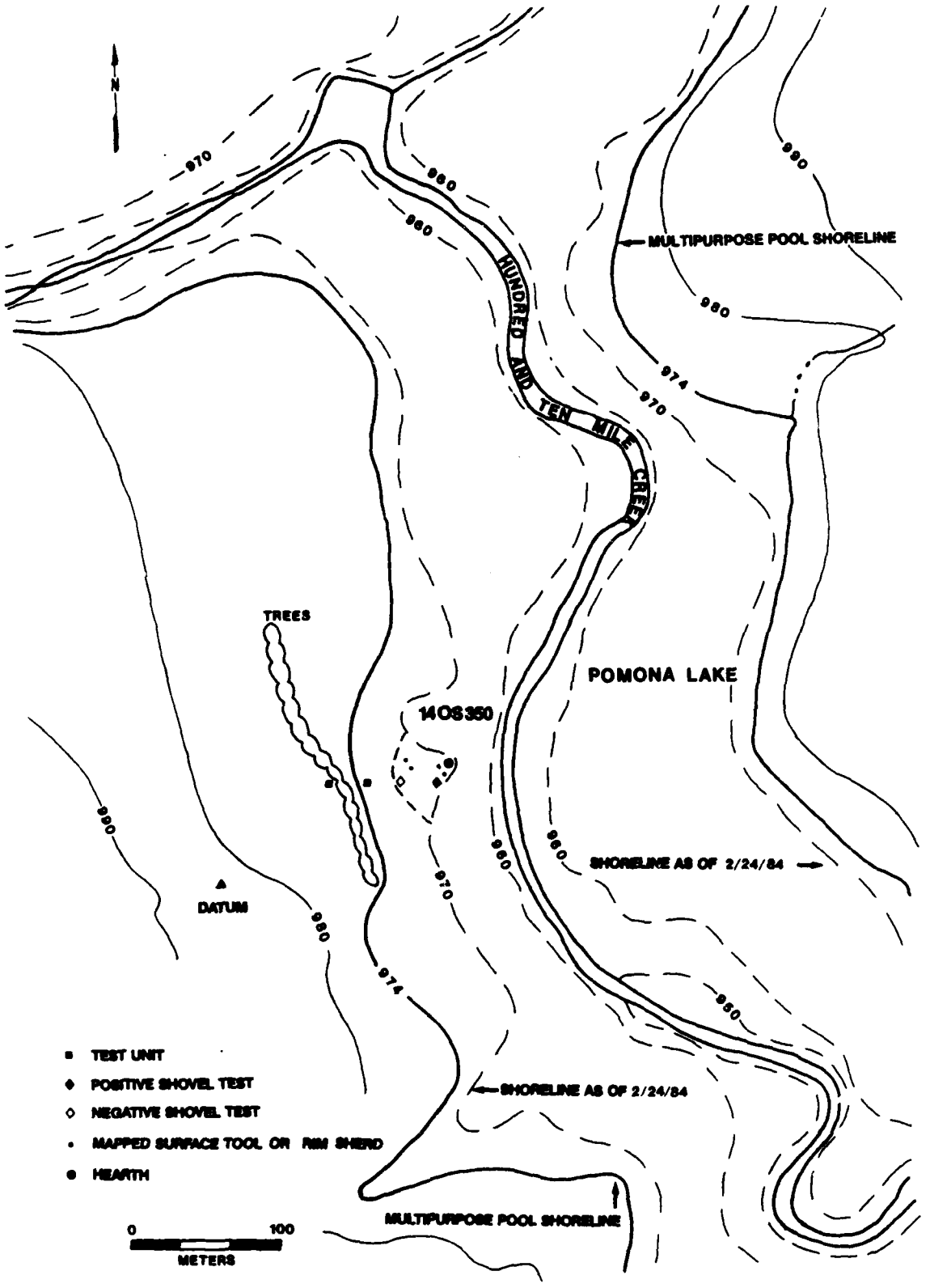



Figure 62. Location and plan view of test excavations at 140S350.

## Soil Stratigraphy

140S350 is situated on terrain mapped by the Osage County Soil Survey as the Osage silty clay, a deep soil formed on alluvium. Numerous small rounded chert pebbles were observed over the surface of the site. Soil profiles from the test units and shovel tests exhibited similar characteristics. The profile of Test Unit 2 is presented below.

| | | |
|---|---|---|
| A | 0-20 cm | Very dark gray silty clay; granular structure. |
| A/B | 20-50+cm | Very dark grayish brown (10YR3/2) silty clay; moderately fine subangular blocky structure. |

The soil was completely saturated in the vicinity of Shovel Tests A and B making accurate profile descriptions difficult. Approximately 10-15 cm of the Ap horizon appears to have deflated near Shovel Test B.

## Cultural Feature

Feature 1 consists of a small cluster of burnt rocks exposed on the surface of the floodplain near the 970 ft contour shoreline (Figure 63). Seventeen pieces of burnt limestone were tightly grouped in a roughly circular pattern measuring 70 cm in diameter. No burnt clay or charcoal was observed in association with the burnt rock, although a light scatter of chips and flakes were recovered from the area surrounding the feature. Feature 1 is interpreted to be the remains of a small deflated hearth.

## Artifact Assemblage

A total of 40 artifacts were recovered from 140S350 including three ceramic sherds, ten chipped stone tools, 25 pieces of lithic manufacturing debris and two pieces of unworked bone. One flake was recovered from the upper 10 cm of Shovel Test B, with the remainder of the assemblage recovered from the surface.

The three body sherds from 140S350 include one grit tempered cordmarked sherd and two indurated clay or grog tempered cordmarked sherds (Figure 58g). These sherds appear to be sections of three different vessels and are comparable to those recovered from Plains Village Pomona focus sites.

The ten chipped stone tools from 140S350 including one projectile point, one bifacial blank, two biface fragments, one scraper, one denticulate and four pieces of edge-modified debitage. All but two of the chipped stone tools are made from local coarse grained brown cherts. Two specimens appear to have been thermally altered. The projectile point consists of a small subtriangular corner-notched dart point with an expanding stem and slightly convex base (Figure 58h). The point is lenticular in cross-section and exhibits a compound fracture consisting

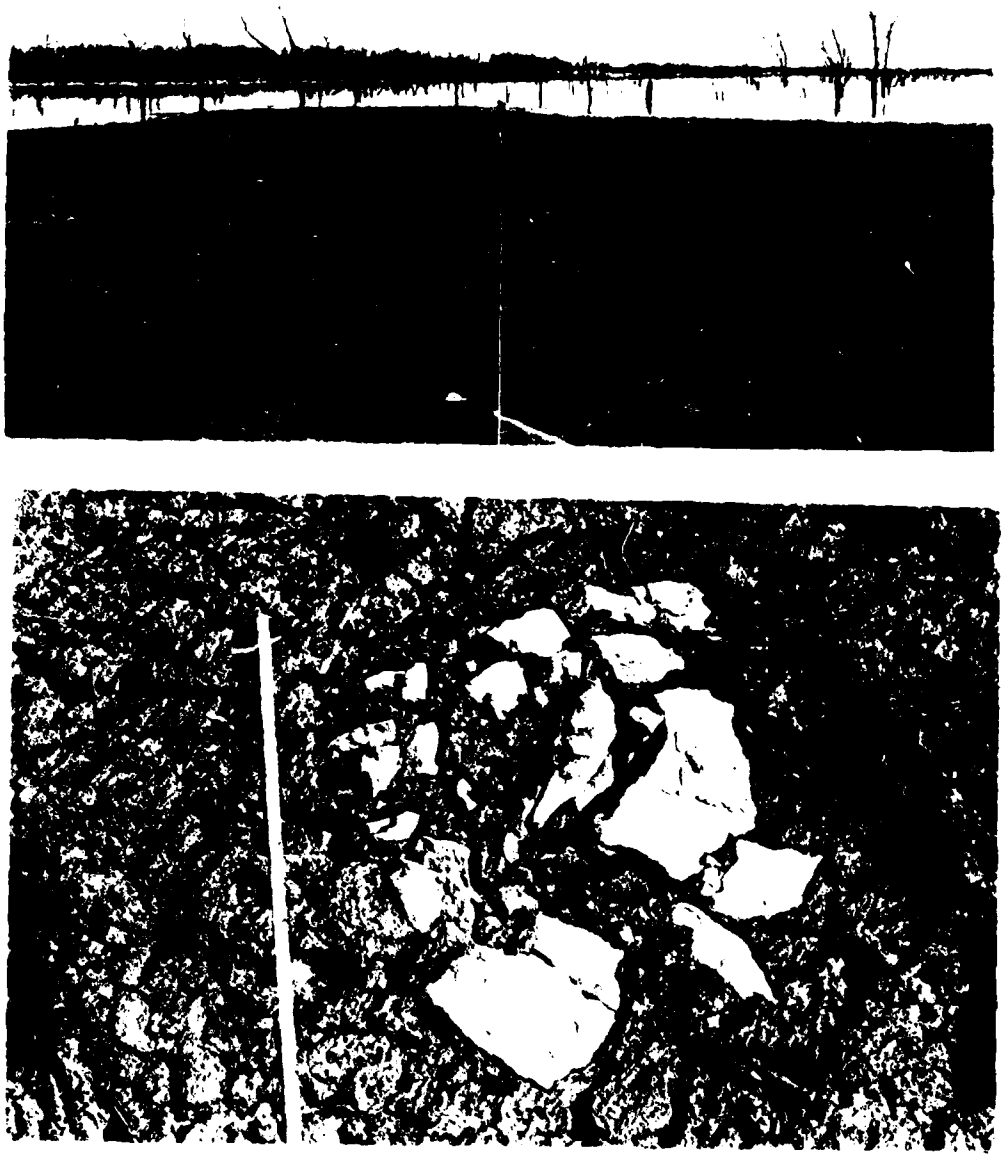


Figure 63. General view of site 140S350 and Feature 1 at 140S350. View looking east at 140S350 (upper). Feature 1 at 140S350 (lower).

of a transverse blade fracture and a longitudinal fracture across one lateral margin of the base. The specimen was manufactured from a nonlocal pinkish-gray fossiliferous chert which appears to have been thermally altered.

The scraper is an end scraper manufactured from a nonlocal, high grade, blue-gray chert (Figure 58i) which has a notch located on its distal end. The denticulate has a saw-like cutting edge which was probably utilized in cutting tasks. The balance of the chipped stone tool inventory consists of four edge-modified flakes. All of the edge-modified flakes were manufactured from local brown cherts and one specimen appears to have been heat treated.

The lithic manufacturing debris includes eight chunks, 15 flakes and two pieces of shatter. All of the chunks are small battered pieces of local brown chert, which were readily available on the surface of the terrace. One chunk has been heated. The flakes are generally small, with decortication flakes, bifacial and pressure flakes being present. Nine of the specimens appear to have been heated and two flakes are made from nonlocal cherts. Two pieces of heat treated shatter are also present.

Two pieces of unworked bone were also recovered from 140S350. Both specimens are robust thick pieces of split bone which have been gnawed by rodents.

## Discussion and Recommendations

140S350 is a small, light lithic scatter situated on the floodplain of Hundred and Ten Mile Creek. The cultural debris appears to be associated with an old deflated Ap soil horizon. Most of the artifacts were recovered near a deflated hearth, although the site covers an area of at least 1200 sq m and appears to extend below the 970 ft contour into Pomona Lake. The recovery of indurated clay or grog tempered ceramics in association with a small corner-notched dart point suggests that the occupation is a Plains Village period Pomona focus component. The presence of a hearth in conjunction with the light density debris scatter and a tool kit composed of a projectile point and light-duty cutting and scraping implements indicates that the site represents a small hunting camp. Some primary tool manufacturing occurred at the site, as is evidenced by the chunks and decortication flakes. However, most of the debitage is composed of small chips and bifacial thinning flakes indicating an emphasis on chipped stone tool maintenance. Activities which may be inferred to have taken place include hunting, butchering, hide preparation, various light-duty cutting and scraping tasks, food preparation, and lithic tool manufacture and maintenance.

The very light surficial nature of the artifact scatter would seem to limit this site's potential to meet the criteria for nomination to the National Register. The debris scatter, however, appears to be thicker near the 970 ft contour shoreline and to extend into Pomona Lake. While 140S350 is not recommended to be eligible for the National

Register based on the data recovered to date, it is recommended that 140S350 be monitored during future draw-downs of Pomona Lake since additional significant data may be present at the site.

## 140S367

140S367 was recorded by Tom Witty of the Kansas State Historical Society in 1976, when he reported the site to consist of a lithic and burnt rock scatter extending over an area of 40 sq m. He recovered an end scraper and the distal section of a projectile point and listed the site as a Plains Village period occupation. When relocated, 140S367 consisted of a light to moderate density lithic scatter observed over approximately 200 m of shoreline. The site is situated on a terrace between the former channels of Valley Brook and Wolf Creek, approximately 200 m northeast of the confluence of these two streams (Figure 60). At the time of the 1982 investigations, the site was located in a fallow field. Ground surface visibility along the eroded shoreline was 100 percent but decreased rapidly to less than ten percent moving inland (Figure 61).

To delineate the site boundaries, all surface artifacts along the shoreline were mapped. This process indicated that cultural materials extended from the tip of the peninsula for a distance of 150 m along the western shore and for a distance of 60 m along the eastern shore. A grid of shovel cuts, was excavated at intervals over the site to determine the interior site boundaries and artifact concentrations. Cultural materials, were found in only two of the shovel cuts. Since the systematic shovel cut excavations failed to delineate any interior site artifact concentrations, test unit transects were located parallel to the artifact concentrations observed along the shoreline. Four transects consisting of 13 one by one m test units were excavated at 20 m intervals. Limited amounts of cultural debris were recovered from Test Units 1, 2, 3, 8 and 9. No midden development was observed in any of the units and cultural materials were restricted to the upper 25 cm of the soil profile. The 1984 transect of shovel tests was located south of Test Unit 7 in order to bisect both the largest expanse of terrain between the 970 and 974 ft contours and the area where debitage concentrations were observed to be the most concentrated. The negative results of these excavations and the deflated condition of the terrain made further subsurface investigations unwarranted.

The 1984 investigations at 140S367 indicated that the terrain in the draw-down zone was highly eroded. Debitage was observed in the draw-down zone, especially near the 970 ft contour south of Test Unit 7. Subsurface investigations in 1984 consisted of the reopening of Test Units 7 and 9 to obtain soil stratigraphic information and the excavation of five shovel tests at 20 m intervals south of Test Unit 7 for the purposes of soil-geomorphic description to document the effects of inundation on the site. No artifacts were recovered from the shovel tests.

## Soil Stratigraphy

140S367 is located on soils mapped by the Osage County Soil Survey as the Summit silty clay loam. Summit soils consist of deep, moderately drained, slowly permeable soils located on uplands that formed in weathered shale deposits. A north-south oriented transect of test units and shovel tests was excavated to document soil erosion across the draw-down zone. The profile description of Test Unit 7 and Shovel Test B are presented below. Shovel Test B is located 40 m south of Test Unit 7.

Test Unit 7:

| | | |
|---|---|---|
| A | 0-13 cm | Very dark grayish brown (10YR3/2) silt loam; granular structure. |
| IIA | 13-30 cm | Very dark gray (10YR3/1) silt loam; granular structure. |
| IIA/B | 30-52 cm | Dark yellowish brown (10YR3/4) silty clay loam; weak subangular blocky structure. |
| IIBt | 52+cm | Dark yellowish brown (10YR3/4) silty clay loam; weak subangular blocky structure. |

Shovel Test B:

| | | |
|---|---|---|
| IIIB/C | 0-20+cm | Mottled clay loam/clay. |

The profile of Test Unit 7 demonstrates the presence of a buried paleosol 13 cm below the surface. The paleosol is highly developed and appears to be of considerable age. If this identification is correct, then the subsurface deposits are too old to contain cultural materials associated with the Plains Village period. A comparison of the profile from Test Unit 7 and Shovel Test B demonstrates the truncation of four soil horizons over a distance of only 40 m. Coring of Test Unit 7 determined that the IIIB/C horizon evident at the surface of Shovel Test B is located 70 cm below surface at Test Unit 7. This indicates that at least 70 cm of solum has been scoured out by past lake level fluctuations. This further indicates that any cultural materials existing below the 974 ft contour are probably out of context.

## Artifact Assemblage

The investigations conducted at 140S367 resulted in the recovery of 498 artifacts. This material includes 53 chipped stone tools, 227 pieces of lithic manufacturing debris and 218 pieces of miscellaneous burnt rock, unworked stone and chert gravel (Table 37).

The chipped stone tool inventory from 140S367 includes two projectile points, four biface fragments, five scrapers, two flake

Table 37. Artifact assemblage from 140S367.

| | Test Units | | | | | | Shovel | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 8 | 9 | 10 | Tests | Surface | TOTAL |
| CHIPPED STONE TOOLS | | | | | | | | | |
| Projectile Points | | | | | | | | 2 | 2 |
| Biface Fragments | | | | | | | | 4 | 4 |
| Scrapers | | | | | 1 | | | 4 | 5 |
| Flake Knives | | | | | | | | 2 | 2 |
| Edge-Modified Flakes | | | | | | | | 34 | 34 |
| Edge-Modified Chunks | | | | | | | | 6 | 6 |
| Total | | | | | 1 | | | 52 | 53 |
| LITHIC MANUFACTURING DEBRIS | | | | | | | | | |
| Chunks | | | | | | | | 7 | 7 |
| Flakes | | | | 8 | | | | 74 | 82 |
| Shatter | 1 | 1 | 1 | 19 | 2 | | 3 | 111 | 138 |
| Total | 1 | 1 | 1 | 27 | 2 | | 3 | 192 | 227 |
| BURNT ROCK | | 1 | | 4 | 4 | | | 1 | 10 |
| UNWORKED STONE | 5 | 1 | 9 | 13 | 1 | 1 | 5 | 173 | 208 |
| TOTAL | 6 | 3 | 10 | 44 | 8 | 1 | 8 | 418 | 498 |

knives, 34 edge-modified flakes and six edge-modified chunks. Approximately 43 percent of the chipped stone tool assemblage has been thermally altered.

The projectile point assemblage is composed entirely of arrow points including one unnotched triangular point (Figure 58j) and one side and basal notched point (Figure 58k). These specimens are common Plains Village period artifacts and conform closely to the Mississippi Triangular and Cahokia Notched point types, respectively, as defined by Chapman (1980).

The bifacial fragments include one small distal fragment and three proximal fragments of points or knives.

Two end scrapers and three side scrapers were recovered. One end scraper was found in the upper 10 cm of Test Unit 9. This specimen was manufactured from a blade blank made of fine-grained blue-gray chert. The distal end exhibits steep edge angle retouch and one lateral margin has moderate angle retouch for cutting or light scraping purposes. The opposite lateral margin exhibits attritional wear resulting from use in cutting tasks. The second end scraper was manufactured from a small triangular secondary decortication flake and exhibits both unidirectional and bidirectional retouch along its proximal edge. One lateral edge of this specimen has unidirectional steep angle marginal retouch with step fracture wear and the opposite lateral edge exhibits attritional wear. The three side scrapers were manufactured from various sized flake blanks and exhibit marginal unidirectional retouch along one or more lateral edges. The marginal retouch results in a steep edge angle and the specimens have step fracture wear. One specimen has a retouched shallow notch indicating use as a spokeshave.

The two flake knives from 140S367 exhibit bidirectional retouch along the lateral margins and fairly heavy attritional wear. The distal end of one specimen has a unidirectionally retouched projection which was probably utilized as a graver spur. Edge-modified flakes and chunks are the most numerous tool type found at 140S367. A total of 34 modified flakes and six modified chunks were recovered.

A total of 227 chunks, flakes and pieces of shatter were recovered from 140S367. The full range of flake types, including primary, secondary, bifacial thinning and pressure flakes are preserved in the assemblage. Approximately 33 percent of the chunks and flakes have been thermally altered. A variety of cherts are present but local brown-gray types derived from gravels predominate. A fine-grained blue-gray chert of high quality is present in small quantities. The balance of the debris recovered from 140S367 consists of 10 burnt rocks and 208 pieces of unworked stone, composed mostly of cherty gravel.

## Discussion and Recommendations

The investigations conducted at 140S367 resulted in the delineation of an extensive site covering an area of 13,020 sq m. The heaviest debris concentrations were located along the eroded shoreline. Systematic excavations of shovel cuts and test units demonstrated that only very limited amounts of cultural materials were located inland. The 35 shovel cuts and 13 test units produced only one tool, eight flakes and 11 pieces of shatter, all of which were restricted to the plowzone.

The analysis of the artifact assemblage indicates that activities associated with hunting and butchering, hide preparation and light-duty cutting and scraping tasks were conducted at this site, as well as the manufacture of chipped stone tools. Most of the debitage is indicative of chipped stone tool maintenance and modification as no cores were recovered. The notched and unnotched arrow points indicate that this occupation is probably affiliated with the Plains Village period Pomona focus.

The artifact assemblage suggests that 140S367 represents a Plains Village period hunting camp. Alternatively, the site could be the periphery of a more intensive occupation, such as a village or hamlet. If this were the case, most of the site must be located below the 974 ft contour. The 1984 investigations indicate that the exposed shoreline terrain between the 974 ft and 970 ft contour elevations was highly deflated. Over 70 cm of soil has been scoured out along the shoreline. Cultural debris, consisting of debitage, was observed in the draw-down zone. This debris was lightly concentrated along the 970 ft contour south of Test Unit 7 and consists of larger flakes and chunks which were clearly out of stratigraphic context. The extent to which 140S367 extends below the 974 ft contour could not be firmly established since the artifacts could have been transported some distance. The intensity of the occupation could not be determined for similar reasons. If a habitation site such as a village was located between the 974 and 970 ft contour, it has been largely destroyed.

140S367 likely represents a Plains Village period hunting camp or a more intensive occupation, such as a village, which has been largely destroyed. Test excavations demonstrate that there is little subsurface cultural material and the debris which was recovered is restricted to the plowzone level. Based on the recovery of most of the artifacts from a disturbed shoreline context and on the lack of subsurface integrity, 140S367 has a limited potential to contribute significant information to the prehistory of the region. Therefore, 140S367 is not recommended to be eligible for the National Register.

## SUMMARY

A total of 13 sites were located and investigated as a result of the archaeological survey and testing program conducted in 1982 and 1984 at Pomona Lake. Data on the cultural affiliation, site type, regional research significance potential, and National Register recommendations are presented in Table 38. Sufficient data for determination of National Register eligibility was recovered from eleven sites. Two sites (140S102 and 140S103) are located outside the project area and were not tested. These sites are being impacted by agricultural practices and are in danger of destruction by flood related activities. Local informants have stated that these sites, located upstream from Pomona Lake, have been damaged by flooding during spring floods on Pomona Lake. They should be tested to determine their eligibility for the National Register.

Three of the remaining ten sites are recommended for nomination to the National Register. 140S104 is interpreted as a small Plains Woodland period Greenwood phase camp. The overall Greenwood phase settlement system has not been adequately studied. 140S104 is, therefore, of considerable importance in understanding Greenwood phase settlement patterns. 140S108 and 140S109 are interpreted to be larger, Plains Woodland or Plains Village hamlets. No diagnostic artifacts were recovered from 140S108, however the style of some of the scrapers and

Table 38. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Pomona Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION/ SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION ELIGIBLE | NOT ELIGIBLE |
|---|---|---|---|---|---|---|
| 140S101 | Lowland/ Osage Soil | Unknown | Limited Use | Site lacks content. Site area disturbed by eroded gullies. | | + |
| 140S102 | Upland/ Dennis Soil | Plains Village Pomona Focus | Village | Unknown. Site should be tested. Outside the survey area. | | |
| 140S103 | Lowland/ Verdigris Soil | Unknown | Camp | Unknown. Site should be tested. Outside the survey area. | | |
| 140S104 | Lowland/ Verdigris Soil | Plains Woodland Greenwood Phase | Camp | Considerable. This element of the Greenwood Phase settlement-subsistence system has not been adequately studied. | + | |
| 140S105 | Upland/ Summit Soil | Plains Village Pomona Focus | Village | Site area located above the 970 ft msl contour has been scoured. Cultural materials are out of context. Site condition below the 970 ft contour is undetermined. | | + |
| 140S106 | Upland/ Lula Soil | Historic Euroamerican, Plains Village, Pomona focus | Residential Village | Most of site is located along disturbed shoreline context. Site lacks subsurface integrity. | | + |
| 140S107 | Upland/ Summit Soil | Unknown Prehistoric | Limited-Use | Lacks content and subsurface integrity. | | + |

continued

Table 38 continued. Topographic position, soil type, cultural affiliation, inferred site function, significance and National Register recommendations for sites located in the Pomona Lake survey.

| SITE NUMBER | TOPOGRAPHIC POSITION/ SOIL SERIES | CULTURAL AFFILIATION | INFERRED ACTIVITY | SIGNIFICANCE IN RELATION TO REGIONAL RESEARCH PROBLEMS | NATIONAL REGISTER RECOMMENDATION NOT ELIGIBLE | NATIONAL REGISTER RECOMMENDATION ELIGIBLE |
|---|---|---|---|---|---|---|
| 140S108 | Upland/ Clareson-Eram Soil | Unknown Prehistoric | Hamlet | Intact structure probable. Prehistoric settlement-subsistence patterns. | + | |
| 140S109 | Uplands/ Lula Soil | Plains Village | Village | Intact features. Prehistoric settlement-subsistence patterns and community organization. | + | |
| 140S110 | Upland/ Lula Soil | Historic Euroamerican | Barn or Outbuilding | Limited content. Foundation walls partially disturbed. | | + |
| 140S111 | Upland/ Summit Soil | Unknown Prehistoric | Camp | Lacks subsurface integrity. Most artifacts recovered from disturbed context. | | + |
| 140S350 | Lowland/ Osage Soil | Plains Village, Pomona focus | Camp | Site appears to lack subsurface integrity. Site condition below 970 ft contour not determined. | | + |
| 140S367 | Upland/ Summit Soil | Plains Village, Pomona focus | Village | Lacks subsurface integrity. Most artifacts recovered from disturbed context. | | + |

the recovery of grass-impressed daub suggest a Plains Woodland or Plains Village period cultural affiliation. The precise temporal affiliation of 140S108 remains unknown. The thin, cordmarked sand tempered body sherd and Scallorn point along with the radiocarbon date of A.D. 1210±70 from 140S109 indicate that it is a Plains Village period Pomona focus site. The one rim sherd and seven body sherds recovered from Locality II at 140S109 clearly are Pomona Ware ceramics. The site size, evidence of structural features and range of tool types also tend to support the interpretation that 140S109 represents a Pomona focus hamlet.

The eight sites considered to be noneligible for the National Register include 140S101, 140S105, 140S106, 140S107, 140S110, 140S111, 140S350 and 140S367. Based on survey data, 140S101 and 140S107 were determined to be limited-use sites of unknown cultural and temporal affiliations. The rest of these sites are either disturbed, have little material content, lack features or have a combination of the above factors which limit their research potential.

140S105 was reported by local informants to be a substantial Pomona focus village or hamlet. The 1982 investigations resulted in the recovery of 17 widely dispersed nondiagnostic artifacts and indicated that the shoreline zone in the vicinity of 140S105 was heavily eroded. The 1984 investigations defined two major localities at the site. Dense concentrations of Pomona focus ceramics and chipped stone tools were found at Locality I. Lighter concentrations of materials were observed at Locality II, but also were out of context. These data indicate that most of 140S105 located above the 970 ft contour has been destroyed by shoreline erosion. The site is therefore not eligible for the National Register. However, 140S105 does extend below the 970 ft contour and the condition of the site or its extent below the 970 ft contour has not been determined. Consequently, it is recommended that 140S105 be monitored during future draw-downs of Pomona Lake, particularly if the lake is drawn below the 970 ft contour.

140S110 consists of the isolated remains of an historic period agricultural outbuilding or shed. This site does not appear to be significant or sufficiently well preserved to meet eligibility requirements for the National Register. Three of the four remaining sites (140S106, 140S350 and 140S367) are Plains Village period Pomona focus sites. Extensive test excavations at 140S106 and 140S367 demonstrate that these sites are largely destroyed, have minimal content and lack subsurface integrity. Most of the cultural materials recovered from these sites were found along the eroded shoreline. The 1984 investigations further indicate that no significant cultural remains are present at these sites between the 970 ft above msl contour and the multipurpose pool shoreline. No further investigations are recommended for either 140S106 and 140S367. The light surficial artifact scatter observed at 140S350 limits this site's potential to produce significant data. However, the artifact scatters at the site were more dense near the 970 ft contour shoreline and appear to extend into Pomona Lake below the 970 ft contour. Consequently, it is recommended that 140S350 be reinvestigated during future draw-downs of Pomona Lake.

140S111 is either a Plains Woodland or Plains Village occupation, although this cannot be precisely determined from the data recovered. As with 140S106 and 140S367, this site's cultural materials were recovered primarily along the disturbed shoreline, and the site lacks both content and subsurface integrity. No significant cultural remains were located between the 970 and 974 ft contours at this site in 1984 and no further investigation is recommended for 140S111.

Two of the three sites (140S108 and 140S109) recommended to be National Register eligible have been partially destroyed by shoreline erosion. However, test excavations demonstrate that sufficient content and subsurface integrity remains to warrant further study. The destruction of 140S108 and 140S109 is an ongoing process and it is recommended that data recovery investigations be conducted as soon as possible. The extent of the data recovery investigations at these two sites is not anticipated to be very large due to the fact that these sites are already partially destroyed. Locality II at 140S109 appears to be less drastically impacted by lake level fluctuations and should be monitored during future draw-downs of Pomona Lake.

The third site recommended to be eligible for the National Register is 140S104, a Plains Woodland Greenwood phase occupation. It is of considerable importance since smaller ancillary Greenwood phase settlements have not been investigated. 140S104 is being impacted by current agricultural practices and should be taken out of agricultural production to prevent further damage to the site.

The investigations at Pomona Lake also resulted in the recovery of data documenting the effects of inundation on cultural resources. These data indicate that sites such as 140S105, 140S106, 140S108, 140S109, 140S111 and 140S367, which are located on light-to-moderately sloping terrain along main arms of the lake, have been heavily impacted by shoreline wave action. The resultant erosion scours upper soil horizons containing archaeological materials. Inundated sites such as Locality II of 140S109 and 140S350, located on terrain below the multipurpose pool shoreline, appear to be less affected by lake related erosion.

# X. SUMMARY AND RECOMMENDATIONS FOR FUTURE CULTURAL RESOURCE MANAGEMENT AT MILFORD, MELVERN AND POMONA LAKES

Larry J. Schmits and Bruce C. Bailey

## INTRODUCTION

Milford, Melvern and Pomona Lakes are three flood control projects located in the Prairie Plains of eastern Kansas and operated by the U. S. Army Corps of Engineers, Kansas City District. More than two decades of archaeological research by the University of Kansas, Kansas State University, the Kansas State Historical Society and the National Park Service have demonstrated the potential of these areas for producing significant cultural resources relating to the prehistory of eastern Kansas. Despite these efforts, the cultural resources of these lakes have been only partially inventoried. In order to provide compliance with Executive Order 11593, entitled "Protection and Enhancement of the Cultural Environment," and the National Historic Preservation Act of 1966 (Public Law 89-665), the U. S. Army Corps of Engineers contracted with Environmental Systems Analysis, Inc. for a program of archaeological surveying and testing at the three lakes.

Milford Lake is located primarily in Geary, Riley and Clay counties, Kansas, with a very small section extending into the northeastern corner of Dickinson County. The lake is situated in the Republican River valley, which is a subbasin of the Kansas River drainage system. Melvern and Pomona Lakes are both located in Osage County, Kansas and are situated on the Marais des Cygnes River, which is a subbasin of the Osage River drainage. In general, the eastern one-third of Kansas is part of the Central Lowlands province of the Interior Plains. The southern three-fourths of this province comprises the Osage Plains subprovince, within which are located the Flint Hills Uplands and the Osage Cuestas. Most of Clay, Riley and Geary counties are situated in the Flint Hills Uplands, while Osage County is located in the Osage Cuestas.

East central Kansas falls into an intermediate, subhumid area which is characterized primarily by its precipitation pattern. Low snowfall and rainfall in winter distinguish the Plains from the forested area to the southeast. Precipitation during the summer is also more variable, so consequently, the prairies are subject to more frequent and more severe droughts than bordering areas to the east.

East central Kansas is primarily covered by the tall grass prairie zone which extends from North Dakota and Wisconsin southward to central Oklahoma, and is dominated by bluestem (Andropogon), indian grass (Sorghastrum) and switchgrass (Panicum). The dominance of tall grasses, paucity of shrubs, and the absence of trees except along waterways and associated bluffs are distinguishing features of the Tall Grass Prairie.

The hillsides along the waterways, if wooded, are generally dominated by bur oak with scattered individuals of bitternut and shagbark hickory. Milford Lake is located within the Tall Grass Prairie. Melvern and Pomona Lakes, located further to the east, fall into a Tall Grass Prairie-Forest Mosaic Zone. This zone consists of a mixture of tall grass prairie and eastern deciduous forest. Within the mosaic the prairies are primarily located on the uplands and the deciduous forest on lowlands and hillslopes. The total flora of the region includes approximately 700 species, considerably more than western sections of the interior grasslands and slightly less than more eastern areas.

The present investigations were designed to provide for archaeological survey and site testing and geomorphic investigations in the project areas. According to the original Scope-of-Work, these investigations were structured to provide a determination of (1) the number of archaeological sites present; (2) their area, and temporal extent; (3) their cultural and scientific importance; (4) their eligibility for the National Register of Historic Places; (5) appropriate mitigative methods for eligible sites; and (6) a predictive model for buried sites. These investigations were to consist of intensive survey and testing of the shoreline (approximately 2430 ac) and 25 percent (450 ac) of four public use areas at Melvern Lake; 25 percent (approximately 4178 ac) of the Licensed Lands and Refuge areas at Milford Lake; and the shoreline (approximately 1980 ac) at Pomona Lake.

The draft report on the initial 1982 investigations, which was submitted to the Kansas City District U. S. Army Corps of Engineers in 1983, contained recommendations for further survey and evaluation of cultural resources at these lakes (Schmits 1983). Concurrent with the review of the 1983 draft report, the Kansas City District was considering plans for a draw-down at Pomona Lake for purposes of dam maintenance. This draw-down provided an ideal opportunity to investigate exposed areas of shoreline adjacent to a number of sites located along the shoreline in 1982. Consequently, in 1983 the Kansas City District requested ESA to conduct additional archaeological inventory and evaluation at the Milford, Melvern and Pomona Lake areas. The additional scope-of-service consisted of the inventory and evaluation of an additional 673 ac at Milford, the testing of six sites (140S17, 140S362, 14LY414 and an unrecorded site at Melvern and 140S105 and 140S350 at Pomona) along with limited testing within the draw-down zone at five sites at Pomona (140S106, 140S108, 140S109, 140S111 and 140S367).

The research goals defined for the cultural resource survey at Milford, Melvern and Pomona Lakes were derived from data acquired from previous investigations, the geomorphological terrain analysis and a review of the currently unavailable information on the archaeology of eastern Kansas. These research goals were divided into three major problem domains: (1) refinement of the culture history of the project area; (2) delineation of settlement-subsistence patterns and (3) formulation of a predictive model for site distribution in the project areas. The field and laboratory strategy were designed to generate data which could be used to fulfill the requirements of the Scope-of-Work, as well as the research goals.

## CULTURE HISTORY

A major goal of the cultural resources survey was to refine the culture history of the three project areas. Data derived from previous investigations as well as the results of the 1982 and 1984 investigations have been summarized below to provide an overview of the cultural history for each project area. For the most part the units discussed are the broad cultural periods discussed in Section III.

### Milford Lake

Data regarding the archaeology of the Milford Lake area has primarily resulted from the amateur surveys and excavations conducted by Floyd Schultz, a resident of Clay Center during the 1920s to 1940s, along with the more recent excavations and surveys sponsored by various federal agencies in connection with lake construction. Schultz's work included the excavation of Plains Woodland burial mounds (Schultz and Spaulding 1948) and Plains Village earthlodges. Subsequently, Schultz's excavated materials, records and field notes were donated to the Museum of Anthropology at the University of Kansas. Over the years a number of students have analyzed portions of these collections. The archaeological data from the mounds were analyzed by Eyman (1966), while the osteological remains were analyzed by Phenice (1969). These reports dealt with Schultz focus mortuary practices as well as the physical characteristics of these people. The Plains Village earthlodges have been analyzed by a number of students in the Department of Anthropology at the University of Kansas.

After authorization to build Milford Lake in the early 1960s, a series of federally funded surveys and excavations began. The first work was performed by the Kansas State Historical Society in 1961 under the sponsorship of the National Park Service and consisted of excavations at the Woods (14CY30), Avery (14CY301) and Streeter (14CY29) sites (Witty 1963). In 1963, the National Park Service funded a survey for sites within the reservoir (Muller and Schock 1964). This work was performed by personnel from the University of Kansas Museum of Anthropology. In 1964 and 1965, the National Park Service continued work at two Smoky Hill sites, Miller (14GE21) and Rush Creek (14GE127) through contracts with the University of Nebraska Department of Anthropology (Sperry 1965).

In 1967, the Kansas State Historical Society tested the Historic Pawnee Bogan site (14GE1) (Marshall and Witty 1967). Finally, in 1975 the National Park Service funded a shoreline survey of Milford Lake (O'Brien 1976). At that time, 22 sites were found eroding out of the shoreline, 20 of which were previously unreported.

With the completion of the 1982 and 1984 investigations, a total of 146 components have been identified in the Milford Lake project area (Table 39) including seven Plains Archaic components, 36 Plains Woodland components, 21 Plains Village components, one Historic Aboriginal

component and 34 Historic Euroamerican components. No known sites with Paleo-Indian components have been located in the lake area.

The Avery site (14CF301) is the only Plains Archaic site that has been intensively studied (Witty 1963). Excavations indicate that the

Table 39. Cultural affiliation of previously recorded and newly recorded components at Milford Lake.

| | PREVIOUSLY RECORDED | | NEWLY RECORDED | | TOTAL | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Plains Archaic | 7 | 5.1 | | | 7 | 4.9 |
| Plains Woodland | 36 | 26.2 | | | 36 | 24.8 |
| Plains Village | 18 | 13.1 | 3 | 33.3 | 21 | 14.1 |
| Historic Aboriginal | 1 | 0.8 | | | 1 | 0.7 |
| Historic Euroamerican | 33 | 24.1 | 1 | 11.1 | 34 | 23.3 |
| Unknown Prehistoric Affiliation | 42 | 30.7 | 5 | 55.6 | 47 | 32.2 |
| TOTAL | 137 | 100.0 | 9 | 100.0 | 146 | 100.0 |

site is a stratified multiple component occupation extending to a depth of five ft below the surface. The materials from the upper component, Zone A, were assigned by Witty (1963) to a late Plains Archaic-Plains Woodland transitional period. The presence of large stemmed and corner-notched points were interpreted to indicate Archaic relationships, while cordmarked ceramics were suggestive of a ceramic Plains Woodland horizon.

Zone B at the Avery site is the lower Archaic occupation zone, however the only diagnostic artifacts consisted of a small blade or large point and the base of a large stemmed point. On the basis of this material and the lack of ceramics, Zone B was attributed to the Plains Archaic period, although the specific phase represented or temporal position is unknown.

A number of other Plains Archaic sites were located in the shoreline survey conducted by O'Brien (1976). She suggests a range of cultural affiliations for these sites from Early to Late Archaic, although in most cases assignment of the sites to the Plains Archaic period is tentative.

The Plains Woodland period in Milford Lake is principally known on the basis of the Schultz's excavations at burial mounds, especially the James Younkin site (Schultz and Spaulding 1948). Recent data has also been obtained from 14GE41, a habitation site (Parks 1978). While this site contained few diagnostic artifacts, radiocarbon dates of 1250-1535 years B.P. place it within the Plains Woodland period.

The Plains Village period is best known from the number of excavated Smoky Hill earthlodges. The basic traits of these assemblages are known, but data regarding burial practices and broader settlement-subsistence patterns are lacking. Eight sites in the Milford locality assignable to the Plains Village period Smoky Hill phase have been excavated. Most were excavated by Floyd Schultz and the remaining sites were excavated and reported on as part of reservoir salvage efforts by the Kansas State Historical Society and the University of Nebraska, Department of Anthropology (Witty 1963; Sperry 1965).

Four of these sites, 14CY1, 14CY2, 14CY3 and 14CY6, are located several miles upstream and outside the current Milford project area. One of these, 14CY2, is a blufftop site, while the other three are located in the lowlands, either on the Republican River floodplain or alongside one of its tributaries. The other four sites are located within the Milford Lake project area and all four are situated in lowland contexts. 14CY30 and 14CY102 occupy positions at the juncture of the Republican River with a tributary, while 14GE21 and 14GE127 are located along tributaries.

These eight sites all contained earthlodges that were roughly square with rounded corners, while two of the sites, the Miller site (14GE21) and the Rush Creek site (14GE127), also had several external pits (Sperry 1965). Radiocarbon dates were obtained from two of the sites, with the Woods site (14CY30) returning dates from the two houses of A.D. 1176±150 and A.D. 1200±120 (Witty 1963) and the Miller site (14GE21) returning two dates from pits of A.D. 1030±90 and A.D. 1180±80 and one date from the house floor of A.D. 1540±100 (O'Brien 1984).

Eyman (1966) originally suggested that the Smoky Hill phase material culture and subsistence pattern based on the cultivation of maize were the result of diffusion from eastern Middle Woodland groups through a Plains Middle Woodland Schultz focus. Eyman was primarily concerned with a series of burial mounds that were investigated by Schultz. Included in the mound fills were ceramics and other artifacts of Kansas City Hopewell, Plains Woodland and the Smoky Hill phase. He noted that the Smoky Hill ceramics may have been intrusive. However, in his discussion and conclusions, he seemed to view the Smoky Hill phase as being partly contemporaneous with the Schultz focus. This seems to have been predicated on the association of the artifacts in the mounds and similarities of certain ceramic traits between the two units.

Information, such as additional radiocarbon dates from the Smoky Hill phase, which has been recovered since Eyman did his work, indicate that his early placement of the Smoky Hill phase is incorrect. The presence of Smoky Hill material in the Schultz focus mounds appears to be intrusive. Furthermore, the sites assignable to the Smoky Hill phase in the lake area indicate no strong evidence for any interaction between Smoky Hill and Schultz focus peoples. Rather, it appears that the Smoky Hill peoples made use of the mounds of previous inhabitants to bury some of their dead.

Steinacher (1976) postulates that the Smoky Hill phase derived from the Solomon River phase as a movement toward and exploitation of the eastern part of the Central Plains, resulting in increasing contact with Mississippian cultures. He differentiates the Solomon River phase from the Smoky Hill phase on the basis of possible Mississippian influences on the Smoky Hill ceramic tradition. Based on the radiocarbon dates obtained from 14CY30 and 14GE21, the Smoky Hill phase in the Milford Lake area can be placed from about A.D. 1000 to A.D. 1300. Solomon River phase dates are earlier clustering from A.D. 500 to 900.

O'Brien (1978) has noted that the possible transition from Smoky Hill to Upper Republican may account for Upper Republican sites being located at the northern end of the lake. However, Steinacher (1976) discounts a transition from Smoky Hill phase to Upper Republican, seeing instead a development of the Smoky Hill Phase into the Nebraska phase.

The Historic Aboriginal period is represented at Milford by the test excavations at the Pawnee Bogan site (14GE1) (Marshall and Witty 1967). This site is a fortified village situated on the uplands overlooking the Republican River. This construction of the fortified villages by the Pawnee is seen as a major change from their Upper Republican predecessors by O'Brien (1984).

Recorded history of the area begins with Fort Riley. In 1852 Col. T. T. Fauntleroy recommended that a fort be built at the juncture of the Smoky Hill and Republican Rivers, which then form the Kansas River, a convenient place to control Indian/settler conflicts. In the fall of 1852, Camp Center was built and named because of its nearness to the center of the United States. In the spring of 1853, the name was changed to Fort Riley. The Lower Republican River valley's history includes the Pawnee-Kansa relationships, most of which were hostile, and which resulted in the Pawnee being forced out of the area. Coupled with this was the movement into Kansas of eastern tribes and the role of the fur trade during the period from 1800-1860. The role of Fort Riley in the region includes the economic and social impact of this fort on nearby rural communities like Milford, Wakefield and Clay Center. This would include the period from 1852 to 1977.

## Melvern Lake

The only site at Melvern Lake which has a Paleo-Indian period component is 140S362 from which lanceolate San Jon-like and Dalton-like points have been recovered. While the Paleo-Indian period materials at the site are mixed with later components, the site appears to have

functioned as a hunting camp which was occupied intermittently from Paleo-Indian through Plains Woodland times. This general lack of evidence of Paleo-Indian occupations suggests that the Melvern Lake area was not intensively occupied during this period. However, other explanations for the paucity of data may be possible. Surveys in the Melvern project area could have missed these sites, especially if they are deeply buried in early terrace deposits. Carl Wright (personal communication) has recently reported the recovery of a deeply buried Dalton-like point from the banks of the Marais des Cygnes near the north end of the lake area. It is also possible that surveys have not covered sufficient area where the Paleo-Indian occupations could be found, such as the uplands. On the whole, however, it is likely that no major occupation of the Melvern project area occurred in Paleo-Indian times.

Six components on Melvern Lake project lands can be assigned to the Plains Archaic period (Table 40). Although excavations have taken place on five of the six Archaic sites, none of the sites have been extensively excavated and the only radiometric data available are the radiocarbon date of 2390±110 years B.P. from 14LY414 and the thermoluminescence date of 6370 years B.P. from 140S17.

Locality I of the Hyde site (140S17) is the earliest Plains Archaic site at Melvern and is one of the earliest securely dated Archaic sites in Kansas. The assemblage from the site is characterized by side-notched and lanceolate projectile points and stemmed bifacial scrapers. The assemblage from the site indicates that hunting, chipped stone tool manufacture and hideworking were the dominant activities that took place at the site. Diagnostic artifacts from 140S17 are similar to materials from the Logan Creek site in northeastern Nebraska, the Cherokee Sewer site in northeastern Iowa and to recently excavated materials from 23JA143 in the Blue Springs Lake area of western Missouri.

The most intensively studied Archaic site is the Cow-Killer site (140S347). Excavations at the site by the Kansas State Historical Society encountered evidence of three stratified components (Reynolds 1982). The lowermost Archaic component probably represents several occupational levels. Features present include pits and burnt rock hearths or rock ovens. Artifacts from the Archaic deposits include forms such as contracting-stemmed points, a side-notched point and a corner-notched point. Other tools include bifaces comparable to the Munkers Creek knives (or sickles) and triangular gouges. Subrectangular and ovate bifaces, a unifacial scraper and a mano were also present. Faunal remains present include bison, deer, cottontail, raccoon, beaver, canids, turtle and fish indicating a diversified subsistence base.

Schmits (1981:192-193) has noted the similarities between the Archaic components at Cow-Killer and Black Vermillion phase Archaic components located along the Big Blue River and its tributaries farther to the north in Pottawatomie and Marshall counties. However, Witty (1982:202) has included the Archaic component at the Cow-Killer site within the Munkers Creek phase noting the similarity of the artifacts from Cow-Killer to those from the William Young site in Council Grove Reservoir. Locality II at the Hyde site also appears to contain a late Plains Archaic Munkers Creek or Black Vermillion phase component which

Table 40. Cultural affiliation of previously recorded and newly recorded components at Melvern Lake.

| | PREVIOUSLY RECORDED | | NEWLY RECORDED | | TOTAL | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Paleo Indian | | | 1 | 4.5 | 1 | 1.4 |
| Plains Archaic | 3 | 5.9 | 3 | 13.6 | 6 | 8.2 |
| Plains Woodland | 10 | 19.6 | 3 | 9.1 | 12 | 16.4 |
| Plains Village | 20 | 39.2 | | | 20 | 27.4 |
| Historic Aboriginal | 2 | 3.9 | | | 2 | 2.7 |
| Historic Euroamerican | | | 8 | 36.4 | 8 | 11.0 |
| Unknown Prehistoric | 16 | 31.4 | 8 | 36.4 | 24 | 32.9 |
| TOTAL | 51 | 100.0 | 22 | 100.0 | 73 | 100.0 |

may be related to the Cow-Killer site.

There is considerable difficulty in assigning the other Archaic assemblages found at Melvern to specific chronological positions. At 14OS1, Moore and Birkby (1964:59-65) note that few artifacts were recovered in the excavation of the site. Three concentrations of burned stone were found which were described as hearths. No diagnostic artifacts were found in association with these hearths. This component was assigned to the Archaic period solely on the basis of a point fragment with a convex base and corner notches which was found on the surface. Thus, although it is likely that an Archaic occupation of the site did occur, the evidence linking these hearths to that occupation is not conclusive. Bradley (1968:29) has noted that 14OS34 suffers from the same ambiguous status, although we have classified the component at the site as Unknown Prehistoric.

A major problem in the Central Plains is defining the transition from the Plains Archaic to the Plains Woodland period. Two sites having a bearing on this question are the late Plains Archaic Walnut phase

components at 14LY414 and 140S362. A rock hearth from the lower component at 14LY414 has been radiocarbon dated at 2390±110 years B.P. At the present, the Walnut phase appears to be a transitional Plains Archaic/Plains Woodland complex. Further investigation of sites representative of this phase will, undoubtedly, shed considerable light on the development of local Plains Woodland cultures from this terminal Plains Archaic phase.

The Plains Woodland period is not fully understood in the Melvern Lake area either. Based on the investigations to date, 12 components were assigned to the Plains Woodland period (Table 40). Because of the confusion over what the Plains Woodland period actually means, and because radiometric dates and associated artifacts are not available in the region, many of these site assignments are highly tentative, and it is possible that some of them may be incorrect.

The best known Plains Woodland component is at the Cow-Killer site (140S347) investigated by Reynolds (1982). Reynolds notes that some of the artifacts from the Plains Woodland component at Cow-Killer are similar to those found at the Two Dog site at the Council Grove Reservoir (Witty 1982) and the Curry site in the Verdigris drainage (Calabrese 1967). These sites have been included within the Greenwood phase and 140S347 should also probably be included within this poorly known cultural unit. The Plains Woodland component at the Cow-Killer site consists of a thick cultural zone containing evidence of one or possibly two structures. The first of these was indicated by a possible fallen roof or wall and an associated hearth. The second structure was represented by nine post molds representing an oval or circular structure with some internal posts. Associated features include hearths, pits, basins and burden areas. A small mussel shell roasting pit was also found.

Plains Woodland ceramics from Cow-Killer include three basic wares (Reynolds 1982). The first is a conoidal jar tempered with burnt and crushed limestone and a surface finish ranging from cordmarked to smoothed to polished. The second was a conoidal jar with a smoothed or slipped surface finish tempered with indurated clay. The third was a cordmarked globular jar tempered with indurated clay. The former two types are similar to the Verdigris ware associated with the Greenwood phase, while the latter is similar to Pomona ware from Pomona focus sites.

Points from the Plains Woodland component at Cow-Killer are predominately expanding stemmed dart points and smaller Scallorn arrow points. Faunal remains include deer, bison and elk along with smaller species such as canids, raccoon, beaver, cottontail, etc. Other species present include prairie chicken, turkey, turtle and mussels. Floral remains include nutshells and a small number of unidentified seeds. No cultigens were encountered and no radiocarbon dates are currently available. Based on the similarities of the ceramics from Cow-Killer to those from the Curry, Two Dog and Gilligan sites, Reynolds (1982) identifies the Plains Woodland component at Cow-Killer as a Greenwood phase component.

Area E of the Wiley site (140S312) has also been assigned to the Plains Woodland on the basis of ceramics found at the site (Moore and Birkby 1964). Logan's (1981) more recent and detailed analysis of the ceramics from the site supports this interpretation. Moore and Birkby note the resemblance to Kivett's (1962:131) Harlan Cord-Roughened ware of the Keith focus. Logan (1981) also compares the Plains Woodland ceramics from Wiley with the Keith focus. Despite the fair amount of work that has been focused on Plains Woodland sites in the Melvern area, this cultural period is still far from completely known.

The Plains Village period in Melvern Lake is represented by the Pomona focus. There are presently 20 Plains Village components located in the Melvern Lake area (Table 40). Two of these, at 140S312 (Wiley) and 140S314 (Harsch), were used by Witty (1967) in his definition of the Pomona focus. Wilmeth (1970) assigned three additional sites to the Pomona focus on the basis of ceramics. Reynolds (1982) also identified a Pomona component at the Cow-Killer site on the basis of Pomona ware and small triangular arrowpoints and Bradley (1968:47) notes that artifacts from 140S3 confirm that this site is a Pomona focus site.

Historic Aboriginal cultural resources are meager at Melvern Lake. Although it is known that both the Kansa and the Osage utilized this area, no remains of either group have been discovered. Two sites, 140S5 and 140S19, may belong to the Historic Aboriginal period. Moore and Birkby (1964:75) mapped a stone foundation of a structure at 140S5, however, no artifacts confirming a Historic Aboriginal association for 140S105 site were found. Local tradition asserts that 140S5 is one of the houses built for the Sac and Fox Indians in the early 1860s. However, measurements of the foundation conflict with the historical records of size houses that were actually built for the Sac and Fox (Aldenderfer 1980).

The results of the 1982-1984 survey and evaluation added a considerable amount of information to the Historic archaeology of the Melvern Lake area with the location of eight historic sites (Table 40). The most important of these is the former Max Morton residence and farm complex. This site consists of the ruins of a large two story stone house and associated outbuildings built in 1872. The structures exhibit important details regarding nineteenth century masonry construction techniques.

On the basis of the preceeding evidence, it appears that human occupation of the Melvern Lake Project area began around 8000-10,000 years B.P. and continued until the present. Evidence for at least four fairly well defined cultural units is present: Black Vermillion or Munkers Creek phase Archaic, Walnut phase Archaic, Greenwood phase Plains Woodland, and the Plains Village Pomona focus. In addition, evidence for a possible earlier Paleo-Indian and an early Plains Archaic cultural manifestation are also present.

It is possible that many of the sites with unknown or ambiguous cultural affiliations can be placed into these phases. It is equally possible, however, that a number of other unidentified cultural groups were present in the Melvern Lake. Some of these ambiguities can be

resolved by more detailed studies of the existing collections, as well as by additional survey and excavation.

## Pomona Lake

With the completion of the 1982-1984 survey and testing program, 30 components have been identified at Pomona Lake. Based on this data, human occupation of the Pomona Lake area extends from the Archaic through the Historic Euroamerican period. Table 41 lists the frequency of components falling into each of the five cultural-historical periods known within the project vicinity.

No sites dating to the Paleo-Indian period have been recorded within Pomona Lake. Given the data presently available, it seems that the Pomona Lake area was not occupied or at least not intensively occupied during the Paleo-Indian period. It is possible however, that buried sites remain undiscovered in alluvial fills within the project area which date to this period.

Only two sites within the project area can be assigned to the Archaic period (Table 41). 140S309 contained several contracting stemmed Langtry points, but has since been inundated (Wilmeth 1958). The Archaic component at 140S102 located during the current investigations consists of a moderately dense scatter of lithics on an upland slope overlooking Dragoon Creek. The presence of a small side-notched dart point, similar to those recovered from the Hyde site (140S17) indicates an early Plains Archaic affiliation. The small amount of cultural material recovered from the site, however, precludes a detailed comparison with 140S17 or other early Archaic sites along the Prairie Plains border.

The Woodland period is represented by four components within the Pomona Lake area (Table 41). Two of these sites, 140S308 and 140S311, are lowland occupations, which have since been inundated. 140S342 is a habitation site located on the uplands along Dragoon Creek. 140S104, a lowland site situated on Verdigris soil along Dragoon Creek, is the only Plains Woodland period component identified during the 1982-1984 survey. Diagnostic artifacts including ceramics, indicate the site is a Greenwood phase component. The restricted tool inventory, consisting of projectile points, a scraper and edge-modified flakes, indicates the site was occupied for a limited duration and that it probably represents a hunting camp. Activities inferred from the artifact inventory include hunting, light-duty scraping, food preparation, and tool manufacture and tool maintenance. Because 140S104 represents one of the smaller currently recognized Plains Woodland Greenwood phase settlements, it was recommended for nomination to the National Register of Historic Places.

Given the limited information available on previously recorded Plains Woodland sites within the Pomona Lake project area, relatively little can be said regarding the relationship of these Plains Woodland with other Woodland complexes recognized in eastern Kansas. The data recovered from 140S104 does indicate a relationship with the best known Plains Woodland site within the Melvern Lake area, the Cow-Killer site

(140S347).

Table 41. Cultural affiliation of previously recorded and newly recorded components at Pomona Lake.

| | PREVIOUSLY RECORDED | | NEWLY RECORDED | | TOTAL | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Plains Archaic | 1 | 5.9 | 1 | 8.3 | 2 | 6.9 |
| Plains Woodland | 3 | 17.6 | 1 | 8.3 | 4 | 13.8 |
| Plains Village | 5 | 29.4 | 4 | 33.3 | 9 | 31.0 |
| Historic Aboriginal | 4 | 23.5 | 0 | 0 | 4 | 13.8 |
| Historic Euroamerican | 1 | 5.9 | 2 | 16.7 | 3 | 10.3 |
| Unknown Prehistoric Affiliation | 3 | 17.6 | 4 | 33.3 | 7 | 24.1 |
| TOTAL | 17 | 99.9 | 12 | 99.9 | 29 | 99.9 |

A total of nine Plains Village components have been identified within the Pomona Lake area (Table 41). Five of these have been assigned to the Plains Village Pomona focus, making it the best understood cultural manifestation within the Pomona Lake area. The best studied Pomona focus site in the area is the Hart site (140S305), located on the former floodplain of Coon Creek. Excavations conducted by Wilmeth (1970) revealed the presence of an oval residential structure approximately 23 ft by 14 ft containing a double row of interior posts, which functioned as roof supports. The perimeter of the dwelling was marked by rows of irregularly spaced wall posts. Portions of fallen roof beams suggest that the center portion of the roof was flat and that the remainder of the roof sloped from the flat section to the walls. The structure lacked interior features except for a shallow pit. A single radiocarbon date obtained from Feature 3 at the center of the excavated structure dated the site to A.D. 1090±100 (Wilmeth 1970:41).

Ceramics recovered from the Hart site were cordmarked and tempered with grog or indurated clay. While no complete vessels were recovered,

both globular pots and bowls are represented. Decoration is rare and includes only punctates and triangular notches present on single sherds. Projectile points from Hart include triangular notched and unnotched arrow points. Other chipped stone tools include end scrapers, perforators and bifacial knives.

140S367 is an upland site, which consists of a lithic scatter located above the confluence of Wolf Creek and Valley Brook. Diagnostic artifacts recovered during the 1982-1984 investigations include small notched and unnotched triangular arrow points indicating a Plains Village Pomona focus occupation. No ceramics were recovered. The analysis of the artifact assemblage indicated that hunting, butchering, woodworking, tool manufacture, tool maintenance, and hide preparation were the principal activities conducted at the site. These activities suggest that the site was used as a hunting camp.

140S105 also contains a Pomona focus component. The site is located on the floodplain of Dragoon Creek and was most intensively investigated in 1984. Based on the presence of a possible structure and a large Pomona ware ceramic assemblage, 140S105 was determined to be a base camp or hamlet. In addition, a number of notched and unnotched arrow points were recovered. Diagnostic artifacts recovered from the site include cordmarked, indurated clay tempered pottery and notched and unnotched arrow points. The site has been badly destroyed by shoreline erosion.

The Historic Aboriginal period in the Pomona Lake area is primarily represented by the establishment of the Sac and Fox Reservation in 1846 in the southern portion of the lake area. Four components, including one habitation site (140S302) and three cemeteries (140S301, 140S302 and 140S321), are assigned to this period (Table 41). Excavations conducted by Wilmeth (1970) at the Masenthin site (140S301) recovered a grave consisting of a stone lined chamber containing badly disturbed Sac/Fox burial. Only a small amount of skeletal material was recovered since the burial had been cremated prior to interment. Artifacts in the fill of the burial chamber included 465 tubular shell beads and three glass beads dating to the nineteenth century. The grave also contained two small fragments of sheet copper and a ring of copper wire (Wilmeth 1970). All four Historic Aboriginal sites have been destroyed or inundated by the construction of the Pomona Lake.

A total of only three Euroamerican components are located within the Pomona Lake area (Table 41). One of these is the Hart site (140S305) which was excavated by Wilmeth (1970) and probably consists of farm buildings dating to the 1870s. The historic component at 140S106 consists of a recent farmstead destroyed during construction of Pomona Lake. Site 140S110 represents the foundation of an outbuilding associated with the W. W. Hamiliton residence and farm complex built sometime after the 1870s. The site was destroyed during construction of the lake.

On the basis of the preceeding evidence, it appears that indigenous aboriginal populations first inhabited the Pomona Lake area at around 6000-7000 years B.P., and continued to occupy it until the late 1860's.

Evidence for at least five cultural groups is present: the Archaic occupation at 14OS102 is representative of an early Plains Archaic complex similar to the Plains Archaic occupation at Locality I of the Hyde site at Melvern Lake, Greenwood phase Plains Woodland, Pomona focus Plains Village, Historic Aboriginal Sac and Fox, and Historic Euroamerican. It is possible that many of the sites with ambiguous cultural affiliations can be placed into these cultural groups. It is also probable that more cultural groups are present in the Pomona Lake area than is now realized. Questions of the cultural affiliation of particular sites and the broader questions regarding the cultural history of the project area can only be resolved by more detailed studies of the existing collections and by additional excavation and survey.

## SETTLEMENT PATTERNS

### Milford Lake

The 1982-1984 Milford Lake survey inventoried all three terrain types present in the area, including the T-0 floodplain, T-1 terrace and uplands. The literature and records search, in conjunction with the terrain analysis, indicated that all three of these geomorphological settings were likely to contain archaeological deposits. The 1982-1984 survey and testing program at Milford Lake located eight previously unrecorded sites, bringing the total number of sites in the project area to 128. Of the presently known sites at Milford, 22 are located on the T-0 floodplain, 24 are located on the T-1 terrace and 82 are located in the uplands. The majority of these sites occur along secondary streams and intermittent drainages rather than the mainstem of the Republican River.

The 128 sites at Milford contain 146 components with 24 components (16.4 percent) located on the T-0 floodplain, 27 (18.5 percent) on the T-1 terrace and 95 (65.1 percent) on the uplands (Table 42). No Paleo-Indian components have been recorded in the project area. A total of seven Plains Archaic components are represented, including two on the T-1 terrace and five on the uplands. Of the 36 Plains Woodland components represented, three are located on the T-0 floodplain, five on the T-1 terrace, and 28 on the uplands. There are 21 Plains Village components, three of which are located on the T-0 floodplain, ten on the T-1 terrace and eight on the uplands. The single Historic Aboriginal component is located on the uplands. Of the 34 Historic Euroamerican components present, six are located in the T-0 floodplain, two on the T-1 terrace, and 26 on the uplands. A total of 47 Unknown Prehistoric components are represented including 12 on the T-0 floodplain, eight on the T-1 terrace, and 27 on the uplands.

In general, the data presented in Table 42 indicates a strong preference by the prehistoric and historic occupants of the area for upland settings. Nearly two-thirds (65.1 percent) of all the identified

Table 42. Distribution of archaeolgoical components at Milford Lake by geomorphological terrain type and soil type, including sites recorded during 1982 and 1984 survey and evaluations.

| | T-0 FLOODPLAIN | | | | | T-1 TERRACE | | | | | UPLANDS | | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cass/Eudora/Sharpy | Hobbs | Unknown | Total | Percent | Muir | Reading | Unknown | Total | Percent | Crete | Hastings, Holclen Shellaburger | Irwin, Geary Monoma | Sogn,Kipson-Sogn | Unknown | Total | Percent | TOTAL | PERCENT |
| Plains Archaic | | | | 0 | - | 2 | | | 2 | 28.6 | | 4 | 1 | | | 5 | 71.4 | 7 | 4.9 |
| Plains Woodland | 1 | | 2 | 3 | 8.3 | 5 | | | 5 | 13.9 | 4 | 8 | 11 | 4 | 1 | 28 | 77.8 | 36 | 24.8 |
| Plains Village | 1 | 2 | | 3 | 15.0 | 8 | | 2 | 10 | 50.0 | 3 | 3 | 1 | 1 | | 8 | 35.0 | 21 | 14.1 |
| Historic Aboriginal | | | | 0 | - | | | | 0 | - | | 1 | | | | 1 | 100.0 | 1 | .7 |
| Historic Euro-American | 4 | 1 | 1 | 6 | 17.6 | 2 | | | 2 | 5.9 | 5 | 9 | 8 | 4 | | 26 | 76.5 | 34 | 23.3 |
| Unknown Prehistoric | 2 | 7 | 3 | 12 | 25.0 | 7 | 1 | | 8 | 18.2 | 3 | 12 | 5 | 6 | 1 | 27 | 56.8 | 47 | 32.2 |
| TOTAL | 8 | 10 | 6 | 24 | 16.4 | 24 | 1 | 2 | 27 | 18.5 | 15 | 37 | 26 | 15 | 2 | 95 | 65.1 | 146 | 100.0 |
| Percent for Geomorphic Surface | 33.3 | 41.7 | 25.0 | 100.0 | | 88.9 | 3.7 | 7.4 | 100.0 | | 15.8 | 38.9 | 27.4 | 15.8 | 2.1 | 100.0 | | | |
| Percent of Total | 5.5 | 6.8 | 4.1 | | | 16.4 | 0.7 | 1.4 | | | 10.3 | 25.3 | 17.8 | 10.3 | 1.4 | | | | 100.0 |

components are situated on the uplands. The Plains Village period components, and to a lesser degree the Plains Archaic, are the only exceptions to this, with 50 percent of the Plains Village components and nearly 29 percent of the Plains Archaic components situated on the T-1 terraces.

The geomorphological terrain types have been further broken down into soil types in Table 42. Based on the soil survey descriptions, these soil types were grouped within terrain type according to their topographical location and particularly their slope allowing a more refined analysis of site location beyond a simple floodplain, terrace and uplands dichotomy.

Two soil complexes are present on the T-0 floodplain. The Cass-Eudora soils are mainstem river bottom soils which are often flooded. The Hobbs soil is located along secondary streams and flooded creek bottoms. The Muir soil is the primary T-1 terrace soil and is found on terraces in both mainstem and tributary settings. The Reading soil is only found on terraces of tributaries. Moving up-slope from the Muir soils, the Sogn series is situated on moderate and steep upland slopes. The Irwin, Geary, and Monoma series are valley margin soils, in that they occupy sideslopes in the uplands. These three soils are generally situated below the Hastings series. This latter soil occupies ridgetops and uplands overlooking the river valley. The final uplands soil is the Crete, which occupies an upper position on the interfluvial divides above the Hastings and Irwin soils.

The data in Table 42 shows a high usage of the two upland valley margin soils series, the Hastings and Irwin. More than half of the uplands components are situated on these two soil series. In particular, at least half of the Plains Woodland, Plains Archaic, and Historic Euroamerican components located in the Milford Lake project area are situated on these soils, which occupy ridgetop and upper slope settings. The Crete and Sogn soils groups show roughly equal usage, with the Plains Woodland and Historic Euroamerican cultural groups utilizing more heavily sites situated on these soils.

Within the lowland terrain types, the Historic Euroamerican components are highly represented on the mainstem Cass/Eudora floodplain soils. The Plains Village occupations show a tendency to utilize the tributary (Hobbs) and valley terrace settings (Muir).

A third aspect of the site location data emerges from Figures 2 and 6. Clearly, the site locations in the Milford Lake project area cluster on the tributary valleys with only about one-third of the 128 sites situated in the mainstem of the Republican valley. The other two-thirds are either along the tributary valleys or at the juncture of these valleys with the mainstem. To some extent, this distribution may be due to scouring by the Republican River when it floods or it may be due to the lack of below surface sampling necessary to find buried sites in the T-0 floodplain or T-1 Terraces. However, as is discussed below, this same clustering does not occur at either Melvern or Pomona lakes. Therefore, the explanation must be looked for in some other factor such as the availability of resources.

Most likely, water may be the critical factor in the structure of the settlement patterns in the Milford Lake project area. All of the tributary streams with sites on them are large enough to have year-round water flows and therefore, would have been able to support a wide variety of faunal and floral resources. Conversely, the tributary valleys along the upper Marais des Cygnes would probably not have carried year-round water flows and therefore, the resource availability would have been more restricted. In addition, the intensity of flooding within the Republican valley may have discouraged the use of floodplain locations for longer term occupations.

In summary, the site locational data indicate a strong preference during all cultural periods for sites situated above the mainstem Republican River floodplain, with nearly 84 percent of the occupations located on either the relatively unflooded T-1 terrace or the uplands. Within the uplands, the inhabitants of the Milford Lake area were clearly attracted to locations overlooking the river valley, as more than 55 percent of the cultural components are situated on ridgetop and upper slope soils. Furthermore, there is a strong preference for sites associated with the tributary streams, as opposed to the mainstem of the Republican River.

## Melvern Lake

The 1982-1984 Melvern Lake survey cross-cut all terrain types present in the area. The terrain analysis, in conjunction with the literature and background search indicated that both lowland and upland terrain were likely to contain archaeological deposits. The 1982-1984 investigations located 17 previously unrecorded sites, bringing to 60 the total number of known sites in the project area. Overall, 42 sites are located on the lowlands and 18 sites are located in the uplands.

The 60 sites at Melvern Lake contain 73 known components. The distribution of components in relationship to geomorphic surfaces indicates that both lowland and upland locations were utilized by prehistoric inhabitants of the project area, although a strong preference for lowland settings is indicated (Table 43).

The single Paleo-Indian component is situated on upland terrain. A total of six Plains Archaic components are present, including two in the uplands and four on the lowlands. Of the 12 Plains Woodland components present, 10 are on the lowlands and two are on the uplands. There are 20 Plains Village components, all of which are situated in the lowlands. All eight Historic Euroamerican components are in the uplands, while one Historic Aboriginal component is on the lowlands and one is on the uplands. Unknown Prehistoric components are concentrated on the lowlands with six present there, and six on the uplands.

The upland/lowland terrain distinction is further broken down in Table 43 into soil series located within each terrain type. The large number of lowland components whose soil type is unknown are mostly located within the multipurpose floodpool of Melvern Lake.

Table 43. Distribution of archaeological components at Melvern Lake by geomorphological terrain type and soil type, including sites recorded during the 1982 and 1984 survey and evaluation.

| | LOWLAND | | | | | UPLAND | | | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Verdigris | Osage | Unknown | Total | Percent | Summit | Lebo-Summit | Dennis | Olpe-Kenoma | Eram-Lula | Clareson-Eram | Total | Percent | TOTAL | PERCENT |
| Paleo-Indian | | | | 0 | - | | | | | | 1 | 1 | 100.0 | 1 | 1.4 |
| Plains Archaic | 2 | 1 | 1 | 4 | 66.7 | | | | | | 2 | 2 | 33.3 | 6 | 8.2 |
| Plains Woodland | 3 | 1 | 6 | 10 | 83.3 | | | 1 | | | 1 | 2 | 16.7 | 12 | 16.4 |
| Plains Village | 3 | 2 | 15 | 20 | 100.0 | | | | | | | 0 | - | 20 | 27.4 |
| Historic Aboriginal | | | 1 | 1 | 50.0 | | | | | 1 | | 1 | 50.0 | 2 | 2.7 |
| Historic Euroamerican | | | | 0 | - | 1 | | 2 | | | 5 | 8 | 100.0 | 8 | 11.0 |
| Unknown Prehistoric | | 5 | 11 | 16 | 66.7 | 1 | 1 | 1 | 1 | | 4 | 8 | 33.3 | 24 | 32.9 |
| TOTAL | 8 | 9 | 34 | 51 | 69.9 | 2 | 1 | 4 | 1 | 1 | 13 | 22 | 30.1 | 73 | 100.0 |
| Percent of terrain type | 15.7 | 17.6 | 66.7 | 100.0 | | 9.1 | 4.5 | 18.2 | 4.5 | 4.5 | 59.1 | 99.9 | | | |
| Percent of total | 11.0 | 12.3 | 46.6 | | | 2.7 | 1.4 | 5.5 | 1.4 | 1.4 | 17.8 | | | | 100.0 |

As discussed in Section IV, the Verdigris and Osage soils are both floodplain soils, with the Verdigris bordering the modern river channel and its tributaries and the Osage situated further away from the channel. In general, the Osage soils appear to represent a low T-1 terrace. The upland soils, which include slope soils as well, begin with the Summit series, a footslope soil. They continue up the slopes with the Lebo-Summit, a soil association found on steep convex side slopes, and the Dennis series, a soil situated on convex lower sideslopes and narrow ridgetops. The final three soils represented at Melvern correspond topographically to the valley margin soils at Milford Lake. At Melvern, these are the Olpe-Kenoma, a sideslope and narrow ridgetop complex, the Eram-Lula, a complex similarly situated, and the Clareson-Eram, a complex located on convex ridgetops and sides of ridges.

As shown in Table 43, the predominance of upland sites evidenced at Milford Lake is nearly reversed at Melvern Lake. With the exception of the Historic Euroamerican components, which are situated only on slope and valley margin soils, the majority of occupations are situated on the lowland Osage and Verdigris soils. Presumably, a large number of the unknown soil components would fall into either of these two soil series as well. This lowland preference is evidenced most strongly by the Plains Village components, all of which were located on the floodplain or T-1 terrace and which seem to split equally between the Osage and Verdigris series. Within the upland soils, the Clareson-Eram shows the most utilization with 59.1 percent of the upland components situated on this soil complex. In particular, the Historic Euroamerican occupations are relatively more numerous on this soil series with five of eight components present here.

This lowland preference is predominantly centered on the mainstem Marais des Cygnes valley, as can be seen in Figures 3 and 27. With the exception of the Historic Euroamerican sites, the locus of occupation is clearly not on the tributary streams, as it is at Milford Lake. The tributary streams here at Melvern Lake are generally intermittent, so that a year-round supply of water would not have been available. This lessening of the resource availability in the tributary valleys, when combined with the lower level of flooding by the Marais des Cygnes River, can perhaps be seen as the critical factors in the predominance of mainstem lowland site locations in the Melvern Lake project area.

## Pomona Lake

The 1982-1984 survey at Pomona Lake located 10 previously unrecorded sites, bringing the total number of known sites in the project area to 25. Overall, 14 sites are located on the lowlands and 11 on the uplands and slopes. The 1982 and 1984 shoreline survey and evaluation at Pomona Lake cross-cuts all geomorphic terrain types present in the study area. The terrain analysis, in conjunction with the literature and files search, indicated preliminarily that both lowland and upland were likely to contain archaeological deposits.

The 25 sites at Pomona Lake include 29 components (Table 44). The distribution of these components in relationship to geomorphic features indicates that lowland locations were emphasized by the prehistoric inhabitants of the Pomona Lake project area. Only two Plains Archaic components are represented, including one on the lowlands and one on the uplands. Of the four Plains Woodland components present, three are located on the lowlands and one is on the uplands. A total of nine Plains Village components are represented, including five on the lowlands and four on the uplands. Four Historic Aboriginal components are represented with two located on the lowlands and two on the uplands. One of the three Historic Euroamerican components is located on the lowlands, and two are situated on the uplands. In addition, of the seven Unknown Prehistoric components three are located on the lowlands and four are on the uplands.

The breakdown of the terrain types into soil series in Table 44 shows nearly the same soils that were present in the Melvern Lake project area. As at Melvern, the difficulties with the soils maps resulted in a large number of lowland components situated on unknown soils types. Roughly half the components, fairly evenly spread across cultural periods, are present on the lowlands. In contrast to Melvern, however, the components present on the uplands are relatively more frequent on soils associated with slopes, as opposed to ridgetops and valley margins (such as the Hastings complex at Melvern). In particular, a relatively large number of components are situated on the Summit complex, a soil which occurs in footslope contexts. The large number of sites in this location may be a result of shoreline wave action as several sites located along the shoreline appear to be disturbed. Therefore, the settlement pattern at Pomona Lake should be seen as largely similar to the Melvern Lake settlement pattern, where cultural groups utilized lowland locations more frequently than upland locations. Additionally, this settlement pattern emphasized usage of the mainstem river valley rather than focusing on the tributary valleys.

## PREDICTIVE MODEL

Predictive models of site location are becoming an increasingly effective management tool in facilitating the achievement of competing and often conflicting goals associated with future development and the preservation of significant cultural resources. The most desired and reliable predictive models are those built upon well structured, comprehensive sampling strategies designed to provide quantitative estimates of site distributions in reference to postulated settlement systems (Aldenderfer and Bezsylko 1981:21). One of the primary objectives of the geomorphological terrain analysis at Milford, Melvern and Pomona Lakes was to provide information that could be used to formulate a predictive model of cultural resources present within the project areas. Although it is not possible to determine the number and location of all sites in the three project areas, some estimates regarding probable site density are possible based on previous investigations and the current survey information. The predictive

Table 44. Distribution of archaeological components at Pomona Lake by geomorphological terrain type and soil type, including sites recorded during the 1982 and 1984 survey and evaluation.

| | LOWLAND | | | | | UPLAND | | | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Verdigris | Osage | Unknown | Total | Percent | Summit | Dennis | Olpe-Kenoma | Lula | Eram-Lula | Clareson-Eram | Total | Percent | TOTAL | PERCENT |
| Plains Archaic | | | 1 | 1 | 50.0 | | 1 | | | | | 1 | 50.0 | 2 | 6.9 |
| Plains Woodland | 1 | | 2 | 3 | 75.0 | | | | | 1 | | 1 | 25.0 | 4 | 13.8 |
| Plains Village | 1 | 1 | 3 | 5 | 55.6 | 1 | 1 | | 1 | 1 | | 4 | 44.4 | 9 | 31.0 |
| Historic Aborginal | | | 2 | 2 | 50.0 | 1 | | 1 | | | | 2 | 50.0 | 4 | 13.8 |
| Historic Euroamerican | | | 1 | 1 | 33.3 | | | | 2 | | | 2 | 66.7 | 3 | 10.3 |
| Unknown Prehistoric | | 1 | 2 | 3 | 42.9 | 3 | | | | | 1 | 4 | 57.1 | 7 | 24.1 |
| TOTAL | 2 | 2 | 11 | 15 | 51.7 | 5 | 2 | 1 | 3 | 2 | 1 | 14 | 48.3 | 29 | 99.9 |
| Percent of terrain surface | 13.3 | 13.3 | 73.3 | 99.9 | | 35.7 | 14.3 | 7.1 | 21.4 | 14.3 | 7.1 | 99.9 | | | |
| Percent of total | 6.9 | 6.9 | 37.9 | | | 17.2 | 6.9 | 3.4 | 10.3 | 6.9 | 3.4 | | | | 100.0 |

models of site densities for the three lakes incorporate the survey data compiled during the 1982-1984 surveys, as well as the previous survey work in the three lake areas.

As noted by Nichols et al. (1980), the development of a predictive model is at best tenuous, especially when confronted with an incomplete data set upon which predictions are to be made. Another important point to be kept firmly in mind is that predictive models reflect quantities of sites and not quality. It is possible to have a very significant cultural resource located in a low probability area. At present, sufficient data are not available to determine the cultural affiliation of a large number of sites in the Miford, Melvern and Pomona Lake project areas. Therefore, only very general statements can be made regarding the prediction of site locations for specific cultural periods.

## Milford Lake

The additional data generated by the 1982-1984 survey at Milford Lake have in a large measure verified the settlement pattern indicated by previous investigations conducted in the project area. Most sites were located predominately on the terraces and on uplands overlooking tributary drainages of the Republican River.

The total of 4815 a surveyed at Milford Lake in 1982 and 1984 resulted in the location of six previously recorded and eight previously unrecorded sites along the Republican River. Predictions as to the expected location of sites present in unsurveyed portions of the Milford Lake project area can be made from these data (Table 45). Two of these 14 sites were located on the T-0 terrace, ten were on the T-1 terrace and only two were on the uplands. It should be noted that over 64 percent of the previously recorded sites in the Milford Lake project area are located on the uplands, along tributary streams or large meanders of the Republican River. The data in Table 45 should be viewed with these facts in mind.

The results of the 1982-1984 survey data indicate that a disproportionate number of sites are located on the T-1 terrace. For example, a total of 0.00112 sites per acre were located on the T-0 floodplain, 0.00820 sites per acre on the T-1 terrace and 0.00111 per acre on upland terrain during the 1982-1984 survey. Based on these results, a total of only 0.72 sites per section (640 acres) on T-0 floodplain terrain, only 5.25 sites per section on T-1 terrace terrain and 0.71 sites per section on upland terrain would be expected in unsurveyed portions of the Milford Lake project area.

Because the majority of the area surveyed in 1982-1984 consisted of the floodplain, terraces and uplands of the Republican River, the low predicted site densities may reflect the absence of sites along the mainstem of the Republican River, rather than a true estimate of site densities along the tributary streams. It is almost certain that a much higher density of sites will be encountered in these tributary areas than was predicted by the results of the 1982-1984 terrain analysis.

Table 45. Acreage surveyed, number of sites located and predicted number of sites by terrain type per section at Milford Lake.

| Terrain Type | Acres Surveyed | Sites Located | Sites Per Acre | Predicted No. of Sites Per 640 Acres |
|---|---|---|---|---|
| T-0 Terrace | 1790 | 2 | 0.00112 | 0.72 |
| T-1 Terrace | 1220 | 10 | 0.00820 | 5.25 |
| Uplands | 1805 | 2 | 0.00111 | 0.71 |
| TOTAL | 4815 | 14 | 0.00291 | 1.86 |

These data clearly indicate that all terrain types in the project area do not have an equal probability of site occurrence. In particular, the relative occurance, or ratio of sites per terrain type, along the mainstem of the Republican River should remain valid, with approximately seven times as many sites on the T-1 terrace as on the T-0 floodplain or uplands. In the tributary valleys however, this ratio will probably be too high, as the uplands here should contain a much higher frequency of sites, based on the locations of previously recorded sites.

Overall, the prehistoric components should be predominantly located in upland locations with a smaller number of sites situated on T-1 terraces. In particular, more Plains Archaic and Plains Woodland components should be located in the uplands, while Plains Village occupations should occur most often on the T-0 and T-1 terraces. Historic Euroamerican components should occur predominately in the uplands. Very few surface sites are likely to be located on the T-0 floodplain of the Republican River.

In addition to the prehistoric components on the surfaces of landforms, it is likely that sites are deeply buried in alluvial and colluvial sediments within the Milford project area. The floodplain, terrace, and colluvial deposits are as much as ten m thick in some locations, and the ages of the sediments span the entire Holocene.

Based on correlations with floodplain deposits in the Kansas River valley, T-0 deposits in the Republican River valley aggraded between 2500 years B.P. and the present. Thus, Plains Woodland and even very late Plains Archaic cultural deposits may occur at or near the base of T-0 floodplain deposits. Also, more recent cultural components may be deeply buried in T-0 sediments.

Many of the T-1 deposits in the main valley of the Republican River have been removed as a result of the meandering activity of the river. Where the T-1 terraces are preserved, they correlate with the Newman Terrace in the Kansas River valley. The age of the Newman Terrace ranges from about 12,000 years B.P. at its base to 3000 years B.P. near its surface. Thus, there is good potential for Paleo-Indian and early Archaic cultural components at the base of T-1 deposits in the Milford Lake project area. Middle Archaic cultural materials would likely occur more than one meter below the T-1 surface.

Overbank or levee deposits equivalent in age to the T-0 floodplain frequently bury T-1 sediments in the Republican River Valley. The levee deposits range generally from 50 to 100 cm in thickness. It is likely that Late Archaic and more recent cultural components occur on T-1 surfaces beneath the levee deposits.

Most of the eroded soils from upland slopes have been deposited as colluvium on footslopes and on terrace surfaces. These colluvial deposits are mid- to late-Holocene in age. Therefore, there is good potential for deeply buried Archaic components in the colluvial sediments, especially where they intersect or overlap with the T-1 terrace surfaces.

## Melvern Lake

Most of the sites recorded during the 1982-1984 Melvern Lake survey were located on upland terrain. The total of 2890 acres surveyed resulted in the location of 21 sites including five on the lowlands and 16 on the uplands (Table 46). These data indicate that a disproportionate number of sites are located on the upland terrain. For example, a total of 0.00531 sites per acre were located on the lowlands, while 0.00825 sites per acre were located on the uplands. Based on these results, 3.40 sites per section (640 acres) would be expected on the lowlands, in contrast to the 5.28 sites per section expected on the uplands. The ratio of upland to lowland sites is a little more than 1.5 to 1.0.

Table 46. Acreage surveyed, number of sites located and predicted number of sites by terrain type per section at Melvern Lake.

| | ACRES SURVEYED | SITES LOCATED | SITES PER ACRE | PREDICTED NO. SITES PER 640 ACRES |
|---|---|---|---|---|
| Lowlands | 941 | 5 | 0.00531 | 3.40 |
| Uplands | 1939 | 16 | 0.00825 | 5.28 |
| TOTAL | 2880 | 21 | 0.00729 | 4.67 |

It should be pointed out that the 1982-1984 survey data used to make the predictions presented in Table 46 would provide a poor indication of the locations of previously recorded sites within the Melvern Lake project area. Prior to the 1982-1984 survey, only three upland sites had been recorded while 49 sites were reported for the lowlands. A partial explanation for the discrepancy between the predicted site occurrence and the previously recorded site distribution is a bias of the earlier surveys towards recording sites on the floodplain of the Marais des Cygnes River and the emphasis during the current investigations on upland terrain.

Predictions regarding the expected location and type of sites present in unsurveyed portions of the Melvern Lake project area can be made from these data. Prehistoric sites are most likely to be present on the lowlands of the Marais des Cygnes River and the valley margins surrounding both the river and its major tributaries. Historic sites should be found almost exclusively on the uplands.

The distribution of sites by cultural period also shows some patterning. Archaic occupations should be present on both the uplands and the lowlands with a slightly higher relative frequency on the latter. Plains Woodland occupations should be situated primarily on the lowlands, although a small percentage may occur on the uplands. Plains Village components should be heavily focused on the lowlands, almost to the exclusion of the slopes and uplands. As mentioned earlier, Historic Euroamerican occupations should be present almost exclusively on the uplands.

The potential for deeply buried prehistoric components is very high in the Melvern project area. Thick alluvial deposits occur along the Marais des Cygnes River, and colluvium flanks the lower slopes of the valley. The T-0 floodplain sediments (Verdigris soils) in the project area have not been radiometrically dated. However, based on correlations with other stream deposits in the east-central Plains, the T-0 sediments aggraded between about 2500 years B.P. and the present. Thus, while the T-0 deposits should contain modern artifacts on the surface, the basal sediments may contain Late Archaic and Plains Woodland cultural deposits.

Only two radiometric dates have been obtained for T-1 sediments (Osage soils) in the Melvern Lake area. Charcoal from 60-80 cm below the T-1 surface at 14LY414 yielded a date of 2300±110 years B.P. A thermoluminescence date of 6300 years B.P. was obtained from 20 cm below the terrace surface at the Hyde site (140S17). The T-1 terrace deposits in the Marais des Cygnes valley probably correlate in age to T-1 terraces described and dated in other parts of the Osage River drainage basin. The T-1 sediments should, therefore, range in age from about 12,000 years B.P. to 2500 years B.P. The combination of geoarchaeological evidence from other stream valleys in the Osage River basin, including the Marmaton River in southeastern Kansas (Schmits et al. 1983), and the radiometric dates and archaeological evidence from alluvial deposits in the Melvern Lake project area, suggest that Archaic

and older cultural components should be buried at various depths below the surface of the T-1 terrace.

Colluvial deposits and Pleistocene and Tertiary terraces occur between the loess covered uplands and the T-1 terrace surfaces. In some locations, colluvial sediments merge with the T-1 deposits. The high Pleistocene and Tertiary terraces are too old to contain deeply buried cultural materials. However, the upper colluvial deposits are probably mid-to late-Holocene in age, and it is likely that they contain buried Archaic or later cultural deposits.

## Pomona Lake

The additional data generated by the 1982-1984 survey have nearly doubled the inventory of known cultural resources within the Pomona Lake project area. As at Melvern Lake, the majority of the newly recorded cultural resources are located on the uplands, giving a roughly equal representation to lowland and upland locations.

The 1957 a surveyed at Pomona Lake resulted in the location of three previously recorded sites and 10 previously unrecorded sites along the shoreline of the lake. Three of these 10 were located on the lowlands and seven were situated on the slopes and uplands.

Table 47. Acreage surveyed, number of sites located and predicted number of sites by terrain type per section for Pomona Lake.

| | Acres Surveyed | Sites Located | Sites Per Acre | Predicted No. of Sites Per 640 Acres |
|---|---|---|---|---|
| Lowlands | 975 | 3 | 0.00308 | 1.97 |
| Uplands | 1005 | 7 | 0.00695 | 4.45 |
| TOTAL | 1980 | 10 | 0.00505 | 3.23 |

These data indicate that a disproportionate number of sites are located on upland terrain. For example, a total of 0.00308 sites per acre were located on the lowlands and 0.00695 sites per acre on the uplands during the 1982-1984 survey. Based on these results, a total of 1.97 sites per section of lowland terrain would be expected within the Pomona Lake area, as compared to 4.45 sites per section of upland terrain.

It should be noted that as did the Milford and Melvern surveys, the survey conducted at Pomona Lake in 1982-1984 resulted in a relatively greater number of upland cultural resources, in contrast to the results

of earlier surveys conducted in the project area. Of the 15 previously recorded sites, 12 were located on lowland terrain and only three sites were located on upland terrain.

The above data allow predictions for expected site locations present within the unsurveyed portions of the Pomona Lake project area. Based on this model, sites from all cultural periods represented in the project area should be located primarily on the lowlands and to a lesser degree, the slopes of Dragoon and One Hundred and Ten Mile Creeks. In terms of the location of deposits from specific cultural periods, Plains Archaic occupations should be present on both the lowlands and slopes. Plains Woodland occupations should be located primarily on the lowlands and minimally on the uplands. Plains Village occupations should be focused on the lowland terrain, with some occurrence on the slopes and uplands. Historic Aboriginal components should be spread across the lowlands, slopes and uplands, while Historic Euroamerican occupations should be located on the slopes and uplands.

As noted in the previous discussion, there is good potential for deeply buried cultural materials in the Melvern Lake project area. The same is true for the Pomona Lake project area, since it is also located within the Marais des Cygnes drainage basin.

## RECOMMENDATIONS FOR FUTURE CULTURAL RESOURCE MANAGEMENT AT MILFORD, MELVERN AND POMONA LAKES

Over the past 60 years a relatively large data set on the archaeology of the Milford, Melvern and Pomona Lake areas has been collected as a result of private and federally funded research. Through these decades, significant changes in archaeological methods and theory have occurred. The trend in federally funded research has been away from "salvage" archaeology towards cultural resource management, focused on the location, identification, evaluation and preservation of cultural resources. The National Register of Historic Places is the centerpiece of current cultural resource management. Sites which are determined eligible for nomination to the National Register warrant preservation through actions which mitigate destructive threats to the cultural resource.

Of the three lakes dealt with in the Milford, Melvern and Pomona survey, Milford has been the most intensively investigated. Besides the work conducted by Floyd Schultz in the 1920s and 1930s, three federally funded surveys and four excavation projects have also occurred in the project lands. Additionally O'Brien (1978) has prepared a Preliminary Cultural Resource Management Plan for the project area.

Melvern Lake has also been the focus of a considerable amount of archaeological investigation. These studies have included four federally funded surveys and three testing and excavation projects, as well as the preparation of a Preliminary Cultural Resource Management Plan by Aldenderfer (1980).

Pomona Lake is the least intensively investigated project of the three lakes. Only one federally funded survey and one excavation project have been conducted at Pomona Lake (Wilmeth 1958, 1970). Traub (1978) has also prepared a Preliminary Cultural Resources Management Plan for Pomona Lake.

The 1982-1984 survey and evaluation of cultural resources at Milford, Melvern and Pomona Lakes is a direct result of the recommendations made for each of the lakes in their respective management plans. A summary of previous management recommendations, the results of the 1982-1984 investigations and mitigation recommendations and the recommendations for future cultural resource management for the three lake areas are presented below.

## Milford Lake

The most recent investigations conducted at Milford Lake prior to the 1982-1984 study consisted of a shoreline survey (O'Brien 1976) and a survey of a 15 percent sample of the public use areas (Schwiekhard and O'Brien 1982). O'Brien (1978) also prepared a Preliminary Management Plan for Cultural Resources at Milford Lake. The 1976 shoreline survey resulted in the location of 20 previously unrecorded sites and two previously recorded sites. Test excavations were conducted at 14DN600 and 14CY61 with no further work recommended for either of these sites.

O'Brien recommended the Miller site (14GE21) to be eligible for the National Register based on the results of Sperry's (1965) excavations and recent survey data that indicated that substantial portions of the site remained intact. O'Brien (1976) suggested that the remaining 19 shoreline sites were potentially eligible for the National Register. She recommended that test excavations be conducted at sites 14GE41, 14GE47, 14CY62, 14CY63, 14GE39, 14GE40, 14GE44 and 14GE51. She further recommended that one partially excavated mound (14GE129) located outside of the shoreline survey zone be excavated. O'Brien's (1976) recommendations for future survey work suggested that lands between the multipurpose pool and the maximum floodpool be surveyed. In the Preliminary Cultural Resources Management Plan for Milford Lake, O'Brien (1978) again recommended that the ten sites listed above be tested (presumably to determine National Register elgibility) and that future surveys for sites on U. S. Army Corps of Engineers lands be prioritized by potential threat level to cultural resources. The terrain types O'Brien prioritized for survey, in order of priority, are: 1) potential construction sites; 2) land leased by Fort Riley; 3) the land in the five year floodpool area; 4) public parks, 5) project lands subject to active agriculture; and 6) lands leased for grazing.

Based on O'Brien's recommendations, 14GE41 was excavated in 1977 and a 15 percent sample of the public use areas at Milford Lake were surveyed in 1979 (Schwiekhard and O'Brien 1982). Though Schwiekhard located 18 previously recorded prehistoric sites and 32 previously unrecorded historic sites in the public use areas, she recommended that no additional survey be conducted in the remaining 85 percent of the land in public use areas. She based this recommendation on the highly

disturbed nature of many of the intensively developed public use areas. Instead, Schwiekhard recommended that all U. S. Army Corps of Engineers properties under cultivation both within and outside the maximum floodpool be prioritized for future survey. She further recommended that the shoreline sites located and prioritized for testing by O'Brien be tested to determine their National Register status.

The current 1982-1984 investigations at Milford were the result of the implementation of the O'Brien-Schwiekhard recommendations that lands under cultivation at Milford Lake be surveyed. These investigations at Milford Lake resulted in the location and evaluation of 14 sites. Summary data for the 14 sites located, such as their cultural affiliation, topographic position, potential threats to sites, and recommended mitigative actions are presented in Table 48. Six sites (14CY29, 14CY29,14CY36, 14CY50, 14CY54 and 14CY301) were previously recorded. Eight sites (14CY103, 14CY304, 14CY305, 14CY306, 14DN325, 14DN326, 14DN327 and 14DN328) were located during the course of the 1982 and 1984 survey. The investigations conducted at these 14 sites resulted in the determination that eight sites (14CY28, 14CY29, 14CY36, 14CY50, 14CY304, 14CY305, 14CY306, and 14DN328) lacked sufficient content and integrity to be eligible for the National Register. Based on these determinations, no mitigative actions are recommmended for these sites.

Six sites (14CY54, 14CY103, 14CY301, 14DN325, 14DN326 and 14DN327) were determined to be eligible for the National Register. Recommended mitigative actions for four sites, 14CY103, 14DN325, 14DN326 and 14DN327, consist of removing the site areas from cultivation. This action will prevent further agricultural disturbance to the cultural resources, stabilize the land surface and discourage unauthorized artifact collection. Site 14CY301 should also be removed from cultivation. The cutbank of Quimby Creek, which is eroding into the western edge of Area 1 at 14CY301, should be monitored. At the time of the 1982-1984 evaluative investigations, no cultural deposits were eroding from the cutbank at 14CY301. Periodic monitoring of the cutbank is recommended to determine if the active meander resumes cutting into intact cultural deposits. If such destruction should occur, limited data recovery investigations will be necessary to mitigate the impact. No mitigative actions are presently recommended for 14CY54.

The results of the 1982-1984 investigations tend to support the earlier recommendations made by O'Brien and Schwiekhard, although we would modify these in three areas. We would recommend that project lands under agricultural cultivation in the tributary valleys of the Republican River be given a Priority 1 (instead of a Priority 5) status for future investigations. We also question the recommendation that the remaining 85 percent of the public recreation areas not be surveyed. Undoubtedly, as pointed out by Schwiekhard and O'Brien (1982), large tracts of terrain within the intensively developed public use areas have been mechanically modified to the extent that any cultural resources located there would have been destroyed. However, other tracts within these areas have been less extensively impacted by construction activities. Schwiekhard and O'Brien (1982) report 18 previously recorded sites located within the public use areas and 32 previously

Table 48. Real estate tract numbers, cultural affiliations, topographic position, potential threats, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey of Milford Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE | NATIONAL REGISTER RECOMMENDATIONS NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|---|
| 1014 | 14CY28 | Unknown Prehistoric | T-1 Terrace | Agricultural | | + | None |
| 1016 | 14CY29 | Plains Woodland, Plains Archaic | T-1 Terrace | Agricultural | | + | None |
| 511 | 14CY36 | Unknown | T-0 Terrace | Agricultural | | + | None |
| 1505 and 1512 | 14CY50 | Unknown | T-1 Terrace | Agricultural | | + | None |
| 1014 | 14CY54 | Plains Woodland | Uplands | None | + | | None |
| 1016 | 14CY103 | Unknown Prehistoric | T-1 Terrace | Agricultural | + | | Remove from agricultural production |
| 510 | 14CY301 | Plains Woodland and Plains Archaic | T-1 Terrace | Agricultural and cutbank erosion | + | | Remove from agricultural production and monitor cutbank encroachment |
| 1409 | 14CY304 | Unknown | T-1 Terrace | Agricultural | | + | None |
| 1505 | 14CY305 | Unknown | T-1 Terrace | Agricultural | | + | None |

continued

Table 48 continued. Real estate tract numbers, cultural affiliations, topographic position, potential threats, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Milford Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE | NATIONAL REGISTER RECOMMENDATIONS NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|---|
| 511 | 14CY306 | Unknown | T-1 Terrace | Agricultural | | + | None |
| 228 | 14DN325 | Plains Village (Smokey Hill) | T-1 Terrace | Agricultural | + | | Remove from agricultural production |
| 228 | 14DN326 | Plains Village | T-1 Terrace | Agricultural | + | | Remove from agricultural production |
| 228 | 14DN327 | Unknown Prehistoric | T-1 Terrace | Agricultural | + | | Remove from agricultural production |
| 219 | 14DN328 | Historic Euroamerican Unknown Prehistoric | Upland | Agricultural | | + | None |

unrecorded historic sites. It would therefore appear that a considerable number of cultural resource properties are present in the public use areas. An additional sample of the remaining uninventoried public use areas, which are minimally impacted by previous construction activities, should be surveyed for cultural resources. However, unless future construction is planned at the public recreation areas, the inventory of these areas should be given a low priority.

Thirdly, it is also recommended that future cultural resource surveys at Milford Lake include evaluative studies of known sites to determine their National Register eligibility status. O'Brien's (1978) recommendation regarding testing of those sites in danger of destruction should be prioritized. The 1982-1984 survey of the lands leased in agricultural production has determined that previously known cultural resources are being impacted by agricultural practices such as plowing and terracing. Future investigations in agriculturally leased areas should be done in a systematic manner.

Based on the results of the 1982-1984 survey, a system for prioritizing future research at Milford Lake can be developed. The 1982-1984 survey of 1805 ac of upland terrain resulted in the location of only two sites (14CY54, 14DN328). The analysis of the topographic position of previously recorded sites indicates that 67.7 percent of the 133 components are situated on upland terrain. These upland sites are concentrated along valley margins near tributaries of the Republican River or in locations overlooking prominant meanders of the Republican River near the valley walls. These results indicate that the uplands were utilized differentially, with a bias for site location associated with uplands along tributaries. A total of 43 (32.3 percent) of the previously recorded upland sites are associated with tributaries or meanders of the Republican River, or both. These data indicate that future surveys of upland terrain should be prioritized in these areas.

Another result of the 1982-1984 survey is that of the 14 sites investigated, two are on the T-0 floodplain, ten are on the T-1 terrace and two are on the uplands. However, none of these sites are on terraces of the Republican River. All of the 1982-1984 terrace sites are located along terraces of tributaries of the Republican River. In fact, 43 of the previously recorded sites are situated on T-0 floodplain or T-1 terrace and 92 percent of these sites are located on tributaries rather than along the mainstem of the river itself.

The findings that sites are associated with tributaries provides a basis for an overall research strategy for future cultural resources inventory and evaluation at Milford Lake. As indicated by the predictive model, future cultural resource surveys and testing programs should be organized around the major tributaries of the Republican River, each of which can be considered a study unit. Thus, there would be 11 study units at Milford Lake, including five units, (Curtis Creek, School Creek, Quimby Creek, Cain Creek and Otter Creek) on the west side of Milford Lake, and six units (Rush Creek, Farnum Creek, Madison Creek, Timber Creek, Mall Creek and Lincoln Creek) on the east side of the Milford Lake. Future research could be conducted on a tributary unit by unit basis. Future studies should also be geared to the agricultural

cycle so that all fields surveyed will have adequate ground surface visibility. It is recommended that future investigations of the 11 tributary units should begin at the north end of Milford Lake, since data from Melvern Lake indicates that flood damage is more extreme along the upper reaches of the lake.

The strategy discussed above is intended to provide a means of prioritizing and organizing future cultural resource inventory at Milford Lake. Cultural resource study of uplands and mainstream floodplains should be conducted but should be given a lower priority in scheduling future work. Implementation of these proposed management recommendations would result in the division of the remaining project lands into large blocks suitable for future inventory and evaluation.

## Melvern Lake

In the Preliminary Cultural Resources Management Plan for Melvern Lake, Aldenderfer (1980) recommended that future surveys of Melvern Lake project lands be prioritized by a tripartite level system based on threats and land use. The 1982-1984 investigations conducted at Melvern Lake are a result of the implementation of some of Aldenderfer's management recommendations.

The 1982-1984 survey at Melvern Lake resulted in the location of 17 previously unrecorded sites and four previously recorded sites. Data for the 21 sites located, including their cultural affiliation, topographic position, the potential threats to these sites, and recommended mitigative actions and National Register recommendations, are presented in Table 49. Sufficient data were recovered to determine their National Register eligibility status for 19 of these sites. Two sites, 140S117 and 140S128, were located outside of the survey area and recommendations regarding their potential for nomination to the National Register of Historic Places could not be made on the basis of survey data. The latter of these two sites (140S128) may contain significant data.

Based on lack of content and integrity, 15 sites (140S112, 140S113, 140S114, 140S115, 140S116, 140S119, 140S120, 140S121, 140S122, 140S123, 140S124, 140S125, 140S126, 140S127 and 140S352) were determined to be not eligible for the National Register. Therefore, no mitigative actions were recommended for these sites. However, 140S123 is situated within the limits of Old Arvonia and although this site itself was determined to be too disturbed to warrant nomination to the National Register of Historic Places, its location in Old Arvonia indicates that other Historic period sites undoubtedly exist in the area. Some of these sites may be in a state of better preservation.

Four sites at Melvern, including 14LY414, 140S17, 140S118 and 140S362 were determined to be eligible for the National Register. 14LY414 consists of the remains of a Plains Village Pomona focus village and an earlier Late Archaic Walnut phase occupation. The earlier Late Archaic component is intact and could provide much needed data on Walnut phase settlement-subsistence patterns. The Hyde site (140S17) is one of

Table 49. Real estate tract numbers, cultural affiliations, topographic position, potential threats to sites, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Melvern Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE | NATIONAL REGISTER RECOMMENDATIONS NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|---|
| 614 | 14LY414 | Plains Village, Pomona Focus | Lowlands | Shoreline | + | | Stabilize river bank with rip-rap |
| 613 | 140S17 | Plains Middle Archaic, Plains Late Archaic | Lowlands<br>Lowlands | Agricultural | + | | Remove from agricultural production<br>Seed with native grass |
| 100 | 140S112 | Unknown Prehistoric | Uplands | Shoreline Erosion | | + | None |
| 228 | 140S113 | Unknown Prehistoric | Lowlands | Shoreline Erosion | | + | None |
| 205 | 140S114 | Unknown Prehistoric | Uplands | Shoreline Erosion | | + | None |
| 322 | 140S115 | Plains Woodland or Plains Village | Uplands | Shoreline Erosion | | + | None |
| 107 | 140S116 | Historic Euroamerican Unknown Prehistoric | Uplands | Shoreline Erosion | | + | None |

continued

Table 49 continued. Real estate tract numbers, cultural affiliations, topographic position, potential threats to sites, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Melvern Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE/NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|
| 506 | 140S117 | Historic Euroamerican Unknown Prehistoric | Uplands | Unauthorized collections | Unknown. Site was outside of survey area. Site should be tested. | Undetermined |
| 506 | 140S118 | Plains Woodland | Uplands | Agricultural | + | Remove site area from agricultural production. |
| 436 | 140S119 | Plains Woodland | Lowlands | Shoreline Erosion | + | None |
| 425 | 140S120 | Plains Archaic | Uplands | Shoreline Erosion | + | None |
| 312 | 140S121 | Unknown Prehistoric | Uplands | Shoreline Erosion | + | None |
| 312 | 140S122 | Unknown Prehistoric | Uplands | Shoreline Erosion | + | None |
| 450 | 140S123 | Historic Euroamerican | Uplands | Agricultural | + | None |

continued

Table 49 continued. Real estate tract numbers, cultural affiliations, topographic position, potential threats to sites, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Melvern Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE/NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|
| 123 | 140S124 | Historic Euroamerican | Uplands | Shoreline Erosion | + | None |
| 123 | 140S125 | Historic Euroamerican | Uplands | Shoreline Erosion | + | None |
| 123 | 140S126 | Historic Euroamerican | Uplands | Shoreline Erosion | + | None |
| 200 | 140S127 | Historic Euroamerican | Uplands | Shoreline Erosion Unauthorized artifact collection. | + | None |
| 312 | 140S128 | Historic Euroamerican | Uplands | Unauthorized artifact collection. | Undetermined. Site is situated outside survey area, but potentially significant. | Post site with signs advising public of the illegality of unauthorized artifact collections. |
| 506 | 140S352 | Unknown Prehistoric | Lowlands | Agricultural | + | None |

continued

Table 49 continued. Real estate tract numbers, cultural affiliations, topographic position, potential threats to sites, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Melvern Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE/NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|
| 329 | 140S362 | Paleo-Indian, Plains Archaic, Plains Woodland | Uplands | Agricultural | + | Remove from agri-agricultural production. |

the few known early Plains Archaic sites in Kansas. The site has intact deposits which have the potential to make a significant contribution toward understanding the culture history, settlement-subsistence patterns and lithic technology of early Plains Archaic populations. 140S118 is one of the largest prehistoric habitation sites located in the 1982-1984 survey. The site appears to be a large Plains Woodland hunting camp. Based on the relative integrity of this site and the lack of information on Plains Woodland period habitation sites in the Melvern Lake area, the site is recommended to be National Register eligible. The recommended mitigative action for 140S118 consists of removing the site from agricultural production. This action would halt agricultural related erosion of the site, stabilize the site's surface and discourage unauthorized artifact collection. 140S362 contains Paleo-Indian, Plains Archaic and Plains Woodland components which have the potential to produce significant data regarding the poorly understood Paleo-Indian period, as well as components of the poorly understood Late Archaic and Plains Woodland settlement-subsistence systems.

One result of the 1982-1984 investigations conducted at Melvern Lake was the determination that impacts on cultural resources include systemic changes in fluvial systems upstream from the lake. Along the Marais des Cygnes and its tributaries, these responses include increased flooding and meander cutoffs resulting from dam construction. Interviews with local collectors indicate that sites situated in fields which have been plowed or cultivated and then flooded are being destroyed at a rapid rate. This finding and the consideration that any agricultural practice can lead to soil erosion with the cumulative potential to destroy a site through time, suggests the inadvisability of leasing lands in High Threat areas for agricultural production.

Management recommendations for future cultural resource management at Melvern Lake are similar to those proposed for Milford Lake. As noted above, local informants indicate that potentially significant cultural resources are being destroyed by lake-related spring floods in the upper reaches of the Marais des Cygnes and its tributaries. Based on this information and the determinations that little systematic cultural resource inventory has been conducted in the western end of Melvern Lake, it is recommended that future studies prioritize investigation of agriculturally leased lands in the upper reaches of the Marais des Cygnes and its tributaries.

A total of 94.2 percent of previously recorded sites on Melvern Lake project lands are situated in the lowlands. All but six of these are on the floodplain or terraces of the Marais des Cygnes. These findings are almost the opposite of the findings at Milford Lake where nearly all of the terrace sites are associated with tributaries. Of the 17 sites recorded during the 1982-1984 survey, 13 were located in the uplands. The predictive model of site location formulated for the Melvern Lake area indicates that sites are most likely to be located on the lowlands adjacent to the Marais des Cygnes, with a lower level of occurrence on the uplands. Therefore, a substantial portion of upland terrain should be included in future surveys of the project area to insure a comprehensive inventory of cultural resources. Based on these data, it is recommended that future cultural resources inventory and

evaluation at Melvern Lake be prioritized for study of the lands which are agriculturally leased along the lowland floodplain and terraces of the Marais des Cygnes and its tributaries above the 1042 ft contour at the western end of the lake, including the adjacent uplands.

In terms of developing a research strategy, Melvern Lake could be divided into five study units, including: (1) the Upper Western Unit End, which consists of the terraces on both sides of the Marais des Cygnes from the northern border of the project lands to Duck Creek; (2) the Duck Creek Unit, which would include the terraces and uplands on both sides of Duck Creek from the borders of project lands to the confluence of Duck Creek and the Marais des Cygnes; (3) the Middle Western End Unit, which consists of the terraces and uplands on both sides of the Marais des Cygnes between Duck Creek and Mud Creek; (4) the Mud Creek Unit, which consists of the terraces and uplands on both sides of the creek from the borders of project lands to its confluence with the Marais des Cygnes; and (5) the Morse Creek Unit, which consists of the terraces and uplands on both sides of Morse Creek from the borders of project lands to the confluence of the creek with the Marais des Cygnes. Future surveys of these units should be geared to the agricultural cycles so that adequate surface visibility is present in areas selected for study, thus assuring a comprehensive inventory.

At Melvern Lake, only 5.8 percent of the previously recorded sites are situated in the uplands. As indicated by the predictive model, this difference represents differential usage of the project area by the previous inhabitants, who concentrated on sites along the floodplain of the Marais des Cygnes River. Therefore, the investigators recommend that future cultural resource inventory and evaluation studies of upland terrain be given lower priority status at Melvern Lake.

Based on the results of the 1982-1984 survey at Melvern Lake, two recommendations for future cultural resource inventory and evaluation of upland terrain are proposed. One would be to focus efforts on the uplands along the southern side of Melvern Lake. The southern side of the lake is considered to have a higher potential for sites than the northern side of the lake due to the close position of the channel of the Marais des Cygnes along the southern bluff line. The proximity of the river to the uplands is a potentially significant factor in the location of prehistoric sites. This is illustrated by the location of 14OS362, a large site situated just east of a prominent north to south oriented meander of the old channel of the Marais des Cygnes River. The location of other blufftop upland sites might contribute significantly to the explication of prehistoric settlement patterns in the area.

An alternate sampling strategy of upland terrain at Melvern Lake would consist of the investigation of High Threat, Moderate Threat and Low Threat Areas defined by Aldenderfer (1980). The High Threat areas would include the survey of Arrow Rock and Coeur D'Alene Public Recreation Areas. Low Threat areas include the proposed developments at the Quivira Area, the South Shore Area, the North Shore Area and the Old Stone House Area. Two of the High Threat intensively developed public recreation areas at Melvern Lake were surveyed in 1982. The results of

the investigations at Turkey Point and Sun Dance Public Recreation Areas determined that construction and landscaping activities have already modified large areas of the parks to such a degree that any sites located in the developed areas have already been destroyed. Based on this consideration, it is recommended that the undeveloped Low Threat areas, including Quivira, South Shore, North Shore and Old Stone House Areas, be given priority over the Arrow Rock and Coeur D'Alene public use areas. Moderate Threat Areas which would be surveyed would include agriculturally leased lands on upland terrain. The latter would have high visibility and would result in the definition of more sites.

## Pomona Lake

In the Preliminary Cultural Resource Management Plan for Pomona Lake, Traub (1978) listed and prioritized management recommendations for future cultural resource inventory and evaluation at Pomona Lake. These recommendations include removal of activities now damaging known cultural resources, particularly in reference to 140S342; testing known cultural resources, especially 140S342, 140S350 and 140S367; establishment of a mitigation plan based on the results of the testing at 140S350, 140S342 and 140S367; implementation of a cultural resource survey and evaluation of project lands above the multipurpose pool; revision of the cultural resource management plan based on results of future work; mitigation of adverse effects on significant discovered cultural resources; nomination of sites to the National Register of Historic Places; and implementation of a public education program. The 1982-1984 survey resulted in the implementation of several of these recommendations.

A total of 13 sites were located or tested as a result of the 1982-1984 survey program at Pomona Lake. The sites, their topographic position, National Register recommendation, potential threat and mitigative action are listed in Table 50. Two sites (140S102 and 140S103) were determined to be outside of the survey area, and consequently, were not evaluated. However, it was recommended that the sites be take out of agricultural production, since the two sites, may contain significant data. Based on the results of the project seven of the ten remaining sites (140S101, 140S105, 140S106, 140S107, 140S110, 140S111 and 140S367) were determined to lack sufficient content or integrity to be eligible for the National Register. Therefore no mitigative actions were recommended for these sites.

Three sites (140S104, 140S108 and 140S109) were determined to be eligible for the National Register. 140S104 is an intact Plains Woodland hunting camp which has the potential to yield significant data on Plains Woodland settlement patterns. The recommended mitigative action for this site consists of removing the site area from agricultural production, which would stop erosion, stabilize the site surface and discourage unauthorized artifact collections, thereby preserving the site. 140S108 and 140S109 were determined to be Plains Woodland or Plains Village habitation sites which have been impacted by shoreline erosion. The sites retain some integrity and are significant

Table 50. Real estate tract numbers, cultural affiliations, topographic position, potential threats, National Register recommendations, and recommended mitigative actions for sites investigated during the 1982-1984 survey at Pomona Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE/NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|
| E511 | 140S101 | Unknown | Lowland | Agricultural | + | None |
| F605 | 140S102 | Plains Archaic, Plains Village | Upland | Agricultural | Unknown, site located outside survey area, should be tested. | Remove from agricultural production. |
| F613-2 | 140S103 | Plains Village | Lowland | Agricultural | Unknown, site located outside survey area, should be tested. | Remove from agricultural production. |
| E507 | 140S104 | Plains Woodland, Greenwood Phase | Lowland | Agricultural | + | Remove from agricultural production. |
| D421 | 140S105 | Plains Village Pomona Focus | Upland | Shoreline Erosion | + | None, site already destroyed. |
| B201-2 | 140S106 | Historic, Plains Village | Upland | Shoreline Erosion | + | None, site already lost integrity. |
| B201 | 140S107 | Unknown | Lowland | Shoreline Erosion | + | None, site already lost integrity and content. |

continued

Table 50 continued. Real estate tract numbers, cultural affiliations, topographic position, potential threats to sites, National Register recommendations and recommended mitigative actions for sites investigated during the 1982-1984 survey at Pomona Lake.

| REAL ESTATE TRACT NUMBER | SITE NUMBER | CULTURAL AFFILIATION | TOPOGRAPHIC POSITION | THREAT TO SITE | NATIONAL REGISTER RECOMMENDATIONS ELIGIBLE | NATIONAL REGISTER RECOMMENDATIONS NOT ELIGIBLE | RECOMMENDED MITIGATIVE ACTION |
|---|---|---|---|---|---|---|---|
| E500 | 140S108 | Unknown | Upland | Shoreline Erosion | + | | Limited data recovery excavations. |
| E500 | 140S109 | Plains Village | Upland | Shoreline Erosion | + | | Limited data recovery excavations. |
| B203 | 140S110 | Historic | Upland | Shoreline Erosion | | + | None |
| B202 | 140S111 | Plains Village or Plains Woodland | Upland | Shoreline Erosion | | + | None |
| E307 | 140S350 | Plains Village, Pomona Focus | Upland | Shoreline Erosion | | + | None |
| B202 | 140S367 | Plains Village Pomona Focus | Upland | Shoreline Erosion | | + | None |

in relationship to the explication of Plains Woodland and Plains Village subsistence-settlement patterns. Data recovery investigations, limited in extent, are recommended for both sites. Due to their proximity, possible cultural relationships between the two sites, and the similar impacts, it was recommended that both sites be investigated concurrently. The data recovery investigations should include block excavations and mechanical stripping to locate, map and excavate features, house floors and artifact concentrations.

The 1982-1984 survey and testing program at Pomona Lake resulted in the fullfillment of a number of the recommendations in the cultural resource management plan. Site 140S342, located outside of the 1982 survey area, was not investigated. This site is located in a Vassar State Park camping area and is reportedly being negatively impacted on by park patrons. We concur with Traub's (1978) recommendation that this site be tested to determine its National Register status. The remaining two sites covered in Traub's recommendations were located in the 1982-1984 survey. 140S350 was located in the 1984 draw-down survey, tested and determined to be non-eligible for the National Register. The third site recommended for testing by Traub is 140S367. This site was relocated and evaluated in 1982 and determined to be not eligible for the National Register.

The remaining recommendations of the management plan concern future cultural resource inventory and evaluation at Pomona Lake above the multipurpose pool level (974 ft msl). These recommendations were partially fullfilled as a result of the 1982-1984 shoreline survey. Based on these findings and the development of the predictive model, a design for organizing future cultural resource inventory is set forth below.

Future cultural resource inventory and evaluation at Pomona Lake should be organized, prioritized and conducted in a fashion similar to that suggested for Melvern Lake. Of the previously recorded sites at Pomona Lake, 70.6 percent are situated on the lowlands. In addition, 36.4 percent of the 11 previously unrecorded sites investigated at Pomona Lake are situated on the lowland landforms. These data, in combination with the findings that cultural resources are being destroyed in the upper reaches of the various drainages, indicate that lowland terrain above the 986.4 ft. contour should be prioritized for future survey and evaluation. Future inventory should concentrate on the western lowland property under agricultural lease and proceed downstream to the central part of the lake project. The investigations should be geared to the agricultural cycle so that only fields with a 50 percent or greater surface visibility are studied. The lowlands on both side of Dragoon Creek in this unit should be investigated. The survey of upland terrain, which is located at Pomona Lake primarily on the southern and northern sides of the project, should be give a secondary priority, since sites situated on upland terrain are less likely to be endangered by spring floods. In summary, the recommendations for future cultural resource inventory include: testing of 140S342, limited data recovery investigations at 140S108 and 140S109; and cultural resource inventory and evaluation of U. S. Army Corps of Engineers properties above the 986.4 ft contour.

Future cultural resource inventory and evaluation at the Milford, Melvern, and Pomona Lake areas should also include investigation of deep, subsurface sediments. Surface inventory will provide data representative of only the most recent depositional or erosional events. In the present study, the potential for deeply buried sites has been only qualitatively assessed. Floodplain deposits, especially terraces, should be trenched or cored, and natural exposures should be studied to find buried sites and to determine the configuration of paleo-landscapes and the potential for subsurface site preservation.

Cultural resource inventories and evaluations in the Republican and Marais des Cygnes valleys have failed to yield sizable samples of organic materials that can be radiometrically dated. Future inventories should focus on recovering datable materials from surface and subsurface sediments. Radiocarbon dates are critical information that must be obtained during geomorphic and archaeological investigations. Absolute dating will resolve questions questions concerning the ages of cultural components and the rate of landscape evolution.

## SUMMARY

In 1982 and 1984, Environmental Systems Analysis, Inc. (ESA) conducted an intensive pedestrian survey and evaluation for cultural resources at the U. S. Army Corps of Engineers Milford, Melvern and Pomona Lake projects located in eastern Kansas. The 1982 investigations conducted at Milford Lake consisted of a survey and evaluation of cultural resources located in a 25 percent sample of the lands leased by the Kansas Fish and Game Commission. The investigations conducted at Melvern Lake consisted of a survey and evaluation of cultural resources located in a 25 percent sample of the intensively developed public use areas and the shoreline between the elevations of 1034 and 1042.3 ft above msl. The investigations conducted at Pomona Lake included the survey and evaluation of cultural resources located in the shoreline survey zone between the elevations of 974 and 986.4 ft above msl.

The draft report on the initial 1982 investigations contained recommendations for further survey and evaluation of cultural resources at these lakes (Schmits 1983). Concurrent with the review of the draft report, the Kansas City District, U. S. Army Corps of Engineers was considering plans for a draw-down at Pomona Lake for purposes of dam maintenance. This draw-down provided an ideal opportunity to investigate exposed areas of shoreline adjacent to a number of sites located along the shoreline in 1982. Consequently, in 1983 the Kansas City District, U.S. Army Corps of Engineers requested ESA to conduct additional archaeological inventory and evaluation at the Milford, Melvern and Pomona Lake areas, consisting of the inventory and evaluation of an additional 575 a at Milford, the testing of six sites (140S17, 140S362, 14LY414 and an unrecorded site at Melvern and 140S105 and 140S350 at Pomona), along with limited testing at five sites at Pomona (140S106, 140S108, 140S109, 140S111 and 140S367).

With the completion of the 1982-1984 investigations, a total of 128 sites are recorded at Milford Lake representing at least 142 cultural components. Diagnostic artifacts indicate that aboriginal human occupation of the area began around 7000 years B.P. and continued through historic times. The location of cultural components within the project area is focused on upland terrain and terraces long the tributary streams of the Republican River. Plains Archaic and Plains Woodland components were most often located in the uplands, while Plains Village components were found primarily on the floodplains and T-1 terraces of small streams. Of the 14 sites investigated during the 1982-1984 investigations at Milford Lake, six sites were recommended for nomination to the National Register of Historic Places. Recommended mitigative action consists of removing these sites (14CY103, 14CY301, 14DN325, 14DN326 and 14DN327) from agricultural production and monitoring cutbank erosion at 14CY301. No mitigative action is recommended for 14CY54.

A total of 60 sites were recorded at Melvern Lake which contain 73 known components. Diagnostic artifacts indicate that the human occupation of the Melvern project area began around 8000-10,000 years B.P. and continued through the Historic period. The majority of sites were located in lowlands settings, although a significant number of upland sites were recorded during the 1982 survey. Archaic components were focused on floodplain and terrace contexts along the Marais des Cygnes River as were Plains Woodland and Plains Village components. Of the 21 sites investigated during the 1982-1984 investigations at Melvern Lake, four are recommended for nomination to the National Register of Historic Places. The recommended mitigative mitigative action is to remove sites 140S17, 140S118 and 140S362 from agricultural production. Recommended mitigative action for 14LY414 is to stabilize the river bank adjacent to the site with rip-rap.

At Pomona Lake, 25 sites containing 29 cultural components have been recorded within the project area. Diagnostic artifacts indicate that the aboriginal habitation of the area began by at least 6000-7000 years B.P. and continued through the Historic period, when Indian lands were ceded to the government in 1867. The location of prehistoric settlements within the area was largely confined to the lowlands, although a significant number of components were located on slope terrain. Archaic, Woodland and Plains Village occupations were found most often on the floodplains and terraces of the Marais des Cygnes River. Of the 13 sites investigated during the 1982-1984 investigations at Pomona Lake, three were recommended for nomination to the National Register. Recommended mitigative action at the sites 140S108 and 140S109 consists of limited data recovery, while 140S104 should be removed from agricultural production.

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# APPENDIX I
# GLOSSARY OF TECHNICAL TERMS

alluvial soil - A soil developed from alluvium and exhibiting essentially no horizon development or modification of the recently deposited materials.

alluvium - Soils, sands or gravels deposited by the slowing of running water, such as those released when a stream floods

anthropology - The study of humans inclusive of their physical and cultural attributes. Traditionally, anthropology includes the subfields of physical and cultural anthropology, linguistics, and archaeology.

archaeology - The scientific discipline responsible for recovering, analyzing, and interpreting the unwritten portion of human kind's historic and prehistoric past.

archaeological assessment - An evaluation of the archaeological resources present in an area, their scientific significance, and the cost of protecting or properly investigating them.

archaeological excavation - The scientifically controlled recovery or salvage of a site designed to yield maximum information about the life of the inhabitants, their ways of solving human problems, and of adjusting to and modifying their natural environment.

archaeological inventory - A pedestrian field survey of a given area. This generally includes a records-check.

archaeological resources - Objects and areas made or modified by humans and the data associated with these artifacts and features.

Archaic - A cultural stage prior to the introduction of pottery and agriculture.

arrowhead - A small projectile point often less than one inch in length, used to tip an arrowshaft.

articulated - Bones located in their proper anatomical order.

artifact - A material object made, modified or used by humans. The most common artifacts on archaeological sites include fragments of broken pottery (sherds), stone tools, chips, projectile points, and similar lithic debris.

assemblage - A group of industries found in an archaeological site.

awl - A bone or stone tool used primarily to perforate leather for sewing or in basket weaving.

backed knife - Chipped stone knife with the long edge opposite the cutting edge being intentionally dulled in order to reduce injury to the user.

basal grinding - Dulling the lower lateral edges of a projectile point (usually of Paleo-Indian age) by abrasion in order to reduce the chance of the sinew binding being cut after the point was seated in the shaft.

bifacial - Deliberate alteration upon two opposite surfaces of a stone tool.

blade - Can be either the unhafted portion of a projectile point or a long narrow flake, generally with parallel sides.

blank - An unfinished stone tool partially worked to the shape and size of the intended implement. It is possible that blanks were stockpiled for later completion.

body sherd - Fragment from the lower portion of a ceramic vessel.

B.P. - Before the present.

burial mound - Mounds, often of rock or rock and earth, locally built primarily during the Woodland period which contain human burials.

buried soil - Soil covered by an alluvial, loessal, or other deposit, usually to a depth greater than the thickness of the solum.

camp site - An archaeological deposit, usually small and thin, which is the result of a brief settlement by a group of people.

chert - A structureless form of silica, closely related to flint which was used for chipped stone implements.

chipped stone tools - Knives, scrapers, projectile points, and other artifacts produced by removing flakes.

chronology - The study of a culture or site in terms of its age. The orderly sequence of a series of sites or cultures according to their occurrence in time.

clay - A soil separate consisting of particles 0.002 mm in equivalent diameter. Soil material containing more than 40 percent clay, less than 45 percent sand and less than 40 percent silt.

coiling - A method of manufacturing pottery. Long fingerlike rolls of clay are added one on top of another in a circular fashion, starting at the bottom of a pot and continuing up the sides. The interior and exterior surfaces are then smoothed.

colluvium - A deposit of rock fragments and soil material accumulated at the base of steep slopes as a result of gravitational action.

complex - A series of assemblages or of components which might be defined as a focus (phase), but where there is enough uncertainty as to their associations to refrain from so grouping them.

component - The manifestation of any given focus (phase) at a specific site. The social equivalent of component is the community.

contour - An imaginary line connecting points of equal elevation on the surface of the soil.

contract archaeology - A recent development in which independent archaeologists contract with government or private companies to carry out any surveys or excavations required by antiquities laws.

core - Nodule of stone from which flakes are removed. Typically a core is reduced until most usable flakes are obtained and then it is discarded.

cortex - The outer surface or rind of a chert nodule.

culture - The lifeways of a particular people, including the habits, customs, and artifacts associated with gaining their living, organizing their social and political activities, and practicing their religious rituals and ceremonies.

cultural resources - Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, engineering, art, tradition, religious, or other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

cultural resource management - The development and maintenance of programs designed to protect, preserve and scientifically study and manage cultural resources.

curation - The systematic maintenance and storage of the archaeological data base in such a manner as to retain the integrity of those data and allow it to be accessible and usable for future researchers.

daub - Mud or similar substance used as a plaster to seal cracks and crevices in a dwelling of frame poles interwoven with twigs. This construction technique is called wattle and daub.

debitage - Residual lithic material resulting from tool manufacture.

determination of eligibility - The determination that a property is eligible for inclusion in the National Register of Historic Places. The determination process, outlined in 36 CFR 63, provides the mechanism whereby a government agency can determine whether its undertaking affects significant properties, as required by P.L. 93-291, Section 3 (a) or (b), for those properties not already on the National Register.

diagnostic artifact - Material remnant of a historic or prehistoric technology that provides a temporal and cultural association, which has been determined by previous scientific investigations.

drill - A chipped stone tool with a beveled, pointed end used as a drill or perforator.

effect - An undertaking shall be considered to have an effect whenever any condition of the undertaking causes or may cause any change, beneficial or adverse, in the quality of the historical, architectural, archaeological, or cultural characteristics that qualify the property to meet the criteria of the National Register.

environment - The physical character of the area in which a culture occurs, including its flora, fauna, climate and land features.

erosion - The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

feature - An area in or on the ground where evidence of past human activity can be seen or detected. Among the most frequent features at archaeological sites are fire pits, storage pits, burial pits, hard-packed house floors, and post holes.

flake - The thin, flattened piece of lithic raw material removed from a stone by pressure or percussion-flaking techniques.

flake tools - Stone tools made from flakes removed from cores.

floodplain - The land bordering a stream, built up of sediments from overflow of the stream and subject to inundation when the stream is at flood stage.

fluted - Term which refers to a stone tool manufacturing technique associated with the Paleo-Indian period and which consists of relatively long parallel-sided scars on tool surfaces.

focus - An archaeological cultural unit possessing traits sufficiently distinct or characteristic to distinguish it from all other units of a locality or region and may in instances correspond closely to the local tribe in ethnology.

geomorphic - Relating to the form of the earth or its surface features.

gouge - A chisel with a scoop-shaped cutting edge to be used in woodworking.

grab sample - A sample of artifacts recovered from the general provenience of the site rather than being individually mapped or collected by grid quadrants.

graver - A small or cutting tool with a sharp point or edge used for boneworking.

granular structure - Soil structure in which the individual grains are grouped into spherical aggregates with indistinct sides. Highly porous granules are commonly called crumbs.

grit tempering - Crushed particles of rock such as limestone, chert, or granite which are added intentionally to pottery clay. The grit tempering is supposed to keep the pottery vessel from breaking when it is fired.

grog - Previously fired clay sherds ground and used as a temper in making new ceramic vessels.

ground stone - Stone artifacts manufactured by pecking and abrading techniques. Usually included in this category are grinding and pounding implements such as the manos, metates, mortars, and pestles, as well as celts and axes.

haft element - The portion of a tool exhibiting some facility, (e.g., notching, constriction, and/or grinding), differentiating it from the working portion of a tool and allowing it to be fastened to a handle or shaft.

hammerstone - A rounded stone often a river cobble used as a hammer and characterized by a battered end.

horizons - Broad cultural similarities observed between a few succeeding phases in a given locality and/or between several contiguous localities such as different river valleys.

horizon, soil - A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. The major horizons of mineral soil are as follows:

> O Horizon. An organic layer of fresh and decaying plant residue at the surface of a mineral soil.
>
> A Horizon. The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface

horizon, most of which was originally part of a B Horizon.

Ap Horizon. The surface layer of a soil disturbed by cultivation or grazing.

B Horizon. The mineral horizon below an A horizon. The B Horizon is in part a layer of transition from the overlying A Horizon to the underlying C Horizon. The B Horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A Horizon; or (4) a combination of these. The combined A and B Horizons are generally called the solum, or true soil. If a soil does not have a B Horizon, the A Horizon alone is the solum.

C Horizon. The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B Horizons. The material of a C Horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R Layer. Consolidated rock beneath the soil. The rock commonly underlies a C Horizon, but can be directly below an A or B Horizon.

indurated clay - Temper inclusions in ceramic paste made from ground shale.

in situ - A Latin phrase meaning "in place". An artifact or object found in its original, undisturbed position. Items found in situ provide an opportunity for establishing firm stratigraphic or other associations for dating purposes.

incising - The act of cutting a design into a pottery surface.

integrity - A site that is intact and undisturbed enough to permit the preservation of significant scientific data possesses integrity.

intensive survey - Systematic, detailed, on-the-ground field inspection conducted by professional archaeologists which is sufficient to permit determination of the number and extent of the resources present and their scientific importance.

intrusive - An archaeological object occurring out of its proper cultural and chronological context.

isolated find - The occurrence, usually on the surface, of a single artifact. Not considered a true site.

kill site - An archaeological site where animals were killed or trapped, and normally having few artifacts in proportion to bone.

knapping - The act of flaking stone tool artifacts.

lanceolate - Shaped like a lance, being tapered at one or both ends. In archaeological usage, the term usually refers to long slender chipped stone points or knives pointed at one or both ends.

lithic - Referring to stone.

lithic scatter - A site characterized by a number of flakes and/or tools.

loam - The textural class name for soil having a moderate amount of sand, silt, and clay. Loam soils contain 7 to 27 percent of clay, 28 to 50 percent of silt, and less than 52 percent of sand.

loess - Material transported and deposited by wind and consisting of predominantly silt-sized particles.

mano - A hand stone that has been shaped for use as a grinding or mealing stone in connection with a metate. It is used for crushing and grinding vegetable matter.

metate - A flat stone upon which seeds and other foods are mashed and ground. A hand stone or mano is used with it.

midden - A trash or refuse deposit.

mitigation - The amelioration of losses of significant scientific, prehistorical, or archaeological data accomplished through pre-planned actions to preserve or recover such data by application of professional techniques and procedures.

msl. - Mean sea level.

national register, the - An official list maintained by the National Park Service of architectural, historical, archaeological, and cultural sites of local, state, or national significance worthy of preservation. These sites are nominated to the Register by states or federal agencies and are approved by the National Register staff of the National Park Service.

ocher - A crushed ferruginous (iron rich) mineral ranging from yellow to brown, used as a pigment. Red ocher (hematite) is very often used for ceremonial purposes.

ossuary - A grave where bones of several persons have been deposited.

palynology - The scientific study of pollen.

percussion, direct - A knapping technique in which the flaking tool such as a hammerstone or antler baton is struck on the core or partially finished tool.

percussion, indirect - A knapping technique in which the flaking tool is struck on an intermediate tool (punch) which in turn strikes the core or partially-finished tool.

ped - A unit of soil structure such as an aggregate, crumb, prism, block, or granule, formed by natural processes (in contrast with a clod, which is formed artificially).

perforator - A chipped stone artifact used as an awl or punch.

petroglyph - An Indian drawing or other symbol incised on a natural rock outcrop.

phase - The manifestation of a basic cultural unit that could be comparable to social units in ethnography, such as a tribe or interrelated bands or any unit that has relatively definite boundaries spatially and chronologically and is relatively uniform culturally.

plano convex - Having one flat and one convex side.

platy - Consisting of soil aggregates that are developed predominately along the horizontal axes that are laminated and flaky.

pleistocene - The earlier epoch of the Quaternary characterized by recurrent ice ages.

point - A bifacially flaked, bilaterally symmetrical chipped stone artifact exhibiting a point of juncture on one end and some facility for hafting on the opposite end.

postmold - A stain in the soil representing a house post or any wooden post after the wood has rotted away. It is identifiable by the darker color than the surrounding soil matrix.

pot sherd - A piece of a broken pottery vessel.

pottery - A mixture of clay and a tempering agent which is hardened by firing.

preform - Any piece of lithic material that has been modified to an intended stage of a lithic reduction sequence in a specified assemblage. It is not a finished implement and it has the type within the assemblage.

prehistoric - Prior to written records.

pothunter - An individual who digs sites for pottery and other artifacts for personal gain. This person cares nothing for context, does not accurately record artifact proveniences or publish results, and often shows disdain for federal regulations which prohibit such activity on public lands.

pressure flaking - A method of chipped stone manufacture in which the knapper puts the tip of the flaking tool (e.g., antler tine) on the edge of the nearly-finished stone tool and then "pushes" off each flake. Pressure flaking is generally the final stage in the making of a stone implement.

primary flake - One of the initial flakes detached from the outside of a core. A portion of the core's weathered exterior (cortex) is retained on the flake.

primitive - Used to describe a culture or individual that has not developed a written language.

principal investigator - A professional archaeologist and the person directly responsible for the location and identification or data recovery project. He is responsible for the validity of the material presented in cultural, historical, and archaeological reports. The principal investigator signs the final report and in the event of controversy or court challenge testifies on behalf of the client in support of report findings.

projectile point - A bifacially-flaked implement with a pointed distal end designed for penetrating an animal's hide and a blunted proximal end designed for attachment to a shaft (e.g. a spear point, dart point, or arrowhead).

Protohistoric - The time immediately preceding the beginning of written history in an area. Quite often European trade goods occur on protohistoric sites, since trade items found their way to the Indians before there was any written history concerning them.

provenience - The exact horizontal and vertical location of an artifact or other remains within a site.

quarry - A location where aboriginal knappers obtained the raw material to make their tools. Much of the reduction of large nodules was often done at the quarry, in order to avoid transporting unnecessary weight back to camp (usually in the form of crude bifaces called blanks).

quartzite - A compact, granular rock composed of quartz, used for chipped stone implements.

radiocarbon dating - A method of obtaining the date of bone, shell, or other organic items by measuring the amount of radioactivity of Carbon 14 in them.

reconnaissance Survey - A literature search and records review plus a preliminary on-the-ground surface examination of limited but representative portions of the area to be affected, adequate to assess the general nature of the resources probably present and the probable impact of a project.

research design - A plan, usually generated by the principal investigator in response to a scope-of-work, outlining the proposed approach to a location, identification, or data recovery project (systematic inventory, field survey, testing, or large scale excavation). The research design spells out relevant research problems, research methods, and some predicted results of the study.

retouch - Secondary flaking of a stone implement to remove surface irregularities and to refine or modify the cutting edge. Always done by pressure flaking.

rim sherd - A fragment of the upper circular edge of a ceramic vessel.

rock shelter - An overhang, usually along the base of a cliff or escarpment in which occupation by humans has taken place.

sand - A soil particle between 0.05 and 2.0 mm in diameter.

scope-of-work - A document prepared by a sponsoring agency, the State Historic Preservation Officer or the National Park Service, setting forth its requirements in a cultural resources study.

scraper - A stone implement used to remove fat from hides, smooth wood, scrape leather, etc. Different types are described in terms of the shape and/or position of the cutting edge: side scraper, end scraper, scraper, etc.

sediment - Deposit of mineral particles, usually clay, silt or sand.

sedimentation - The natural process of soil accumulation derived from alluvial (riverine) or colluvial (mass earth movement) processes.

serrated - Having a saw-toothed or multiple-notched cutting edge.

settlement pattern - Distribution of various sites of human activity in a locality (village sites, quarry sites, kill sites, ceremonial sites, etc.).

shatter - Irregular pieces of lithic manufacturing debris.

shell tempering - Small pieces of crushed shell added to the clay before making pottery common in the Mississippian or Plains Village time period.

sherd - A broken piece of a pottery vessel. One of the most durable of archaeological specimens.

silt - A soil separate consisting of particles between 0.05 and 0.002 mm in equivalent diameter. A soil textural class.

site - Any area or location occupied as a residence or utilized by humans for a sufficient length of time to construct features, or deposit a number of artifacts (e.g., camps, villages, rock paintings, quarry, etc.).

soil - A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms. The collection of natural bodies occupying parts of the earth's surface that support plants and that have properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief, over periods of time.

soil map - A map showing the distribution of soil types or other soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

soil profile - Composite distinctive layers and zones of a soil, from the surface to the parent material.

solum - The altered layer of soil above the parent material that includes the A and B Horizons.

spokeshave - A specialized type of scraper with a rounded notch in the edge and probably used for scraping wooden shafts.

strata - Natural or cultural layers in the soil or archaeological sites produced by the accumulation of soil and/or refuse deposits.

stratigraphy - The superimposition of geological or archaeological deposits one upon the other. The relationships indicated by stratigraphy provide a relative system of dating archaeological materials and are therefore extremely important in establishing cultural sequences in an area.

stratum - Single sedimentary layer (plural, strata).

temper - Any substance, such as crushed shell, grog, crushed grit or sand added to pottery clay in order to prevent cracking when the vessel is fired.

terrace - A level, usually narrow, soil surface bordering a river or lake.

testing - A scientific technique of investigating archaeological sites consisting of physical excavation of portions of a cultural or natural deposit and permanent recording of the results.

topsoil - The upper part of the soil that is rich in organic matter.

trait, cultural - A single element or item that is considered to be part of a particular culture. It may be an artifact, house structure, pit, or any smallest unit of a cultural manifestation.

tradition - The socially transmitted cultural form that persists in time (e.g., an artifact tradition, a religious tradition, local cultural tradition, regional cultural tradition, technological tradition, or a major cultural tradition).

transverse fracture - A break in an artifact, parallel or approximately parallel to the base.

typology - The classification of similar artifacts into groups.

unifacial - Deliberate alteration on one surface or edge of a stone tool.

utilized flake - A flake showing evidence of use or wear on one or more edges. No flakes have been intentionally removed, but very small flakes have incidentally detached during use.

vandal - Individual who deliberately destroys or damages archaeological sites.

ware - Pottery or vessels of fired clay.

wattle and daub - A technique of construction involving a framework of poles and interwoven branches which are plastered with clay.

workshop site - An archeological deposit characterized by abundant flaking debris where artifacts were made.