DALLAS ARCHAEOLOGICAL POTENTIAL

procedures for locating and evaluating prehistoric resources

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INTRODUCTION

Archaeological handbooks have primarily been manuals which describe pottery and projectile point styles which have been used at a general level for defining regional cultural patterns or they are text books designed to acquaint students and laymen about archaeological field and analysis methods (Suhm, Krieger and Jelks 1954; Suhm and Jelks 1962; Hawley 1936; Colton and Hargrave 1937; Hester, Heizer and Graham 1977). Such documents have served to integrate collected data but today's need is to integrate archaeology into the project planning process at its inception (McGimsey and Davis 1977) in order to insure responsible management of the known and unknown nonrenewable cultural resources. This study was conducted so that planners concerned with present and future development within the City of Dallas could be aware of the potential occurrence of cultural resources in the City and how adequate evaluation of the resources can be incorporated into planning activities. It is designed to show the planner and land modifier how to meet legal requirements in a timely manner and ultimately how archaeological sites can be preserved for future generations.

This report was prepared at the request of the Department of Urban Planning, the City of Dallas, which with forethought has recognized the need to incorporate natural and cultural resources into their plans for growth. The City realizes that prehistoric and historic archaeological remains are important to the people of Texas and the United States. In order to give these irreplacable resources the attention they deserve they must be incorporated into planning proposed projects. The need to consider archaeology in project planning is emphasized by the National Environmental Policy Act of 1969 (NEPA) and in Chapter 191 of the Natural Resources Code of Texas. Besides legal mandates, the public has a concern for extending its understanding of man's history back into the past and in learning how previous peoples utilized the natural environment without destroying it.

On a more local basis, this study was conducted for the City to serve as an archaeological overview of the variety of prehistoric remains present within the City. This is the first step in planning for future management of the irreplaceable archaeological heritage of northcentral Texas and represents the first instance where a major metropolitan city in the United States has taken the lead to show its interest in and concern for archaeology. It is fitting that the decision to conduct the study lends support to the concern that local citizens, particularly members of the Dallas Archeological Society, have and have had for the history that remains buried within the confines of Dallas. At present a broad understanding of Dallas prehistory has been formulated and it has been possible to recognize the major gaps that are present in our knowledge of early people who inhabited the Dallas area over the past several thousand years. However additional studies will be necessary in order to further understand the way of life of the prehistoric peoples who inhabited this area.

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River Basin overviews were pioneered by the Arkansas Archeological Survey in the Red River Basin (Davis 1970). A basin-wide evaluation of the Trinity River was prepared for the Corps of Engineers by Southern Methodist University (Sciscenti 1972) and a section of that report describes the distribution of known aboriginal sites in the Dallas area (Skinner 1972). Recently the Interagency Archeological Services Division of the Heritage Conservation and Recreation Service (HCRS) of the Department of the Interior has sponsored similar overviews of the St. Louis Metropolitan Area (Benchley 1975) and of East-Central New England (Dincouze and Meyer 1977). These studies attempt to anticipate the impact that future development will have on archaeological resources, particularly those in sensitive areas. A similar predictive study, but of a specific project, was conducted in South Texas (Mallouf, Baskin and Killen 1977). As planning tools these studies are useful but they leave the interpretation and hence the planning of archaeological management in the hands of an archaeologist. In contrast, the San Felipe study in California presents a case where archaeological information was assimilated and zones of archaeological sensitivity or probability were formulated by archaeologists for use by a federal agency (King and Hickman 1973; 1977). We believe that it is incumbent upon archaeologists to provide information that planners can use as well as procedures that will aid planners in understanding how archaeologists conduct studies and prepare project evaluations.

The archaeology of Northcentral Texas has received local, regional, and national recognition during this century due to the discovery of a variety of significant prehistoric and historic finds. These include lifesize human heads which were uncovered at Malakoff near Cedar Creek Lake, the unexplained Wylie Focus pits found at prehistoric camps along the East Fork of the Trinity and the renown Lewisville Site now located under Lake Dallas. In addition to these more spectacular remains, many archaeological sites have been located and reported by amateur archaeologists, concerned citizens, and professional archaeologists. Although these bits and pieces of information have been available, they have heretofore not been incorporated in the planning of land modifying activities. Consequently, untold numbers of prehistoric and historic localities have been destroyed inadvertently and the general public remains to be advised of the archaeological potential of this region.

This report is the first step in the development of a comprehensive management plan for the known and as yet unknown archaeological resources contained within the limits of Dallas (Figure 1). The major question which guided this study was "How can the planner avail himself of extant knowledge in order to determine if, when, where, and how much archaeological investigation needs to be done in order to satisfy requirements of archaeological legislation and to insure the timely preservation or investigation of the irreplaceable prehistoric record contained in Dallas?"

We have approached this question by synthesizing information about archaeology in the Dallas area and evaluating the reported and recorded prehistoric sites in terms of their relationship to environmental variables

including soil zones, topography and hydrology (second and third chapters). This information contributes to the development of archaeological probability zones presented in the fourth chapter. These zones are graphically illustrated and are also available at a larger scale from the Department of Urban Planning, the City of Dallas. These zones constitute a testable model which can be refined, modified and improved in the future; if so, it will have served its intended purpose. The logical extension of this study is the beginning of a systematic, coordinated, long-term program of archaeological survey and testing in the Dallas area.

The fifth chapter represents the "how to" part of the study. It shows how the planner who is concerned primarily with federally assisted development projects can use the probability zones to determine the kind and level of investigation needed in order to meet present state and federal legislative requirements for cultural resources and their management. The National Environmental Policy Act of 1969 (NEPA) has been used as the overarching legislative foundation and by following its format serves to insure satisfactory compliance with the matrix of laws, executive orders and agency regulations with which city planners can expect to come in contact. The final section of this chapter provides estimates of time, facilities and capabilities needed to satisfy the laws and to complete a professional quality study.

The attached appendices include the laws and other pertinent information which relate to archaeological resource evaluation.

NATURAL ENVIRONMENT

The environment of the Dallas area includes two major biotic provinces: the Eastern Cross Timbers and the Blackland Prairie (Figure 2). The character of the two zones is shaped largely by the underlying geologic strata and the overlying soils and sediments. Drainages are also important in shaping the provinces. The bottomland and transitional habitats of both provinces are similar, due to the constant moisture content available in the floodways. The upland habitats of the two provinces are more divergent, one a grassland the other an open woodland. For the purpose of this study, soils were particularly useful for stratifying the area and developing archaeological sensitivity zones. The following discussion reconstructs the pre-Anglo (ca. 1820) natural environment of the area and presents some important changes of the zones during the past one hundred and fifty years.

Eastern Cross Timbers

The Eastern Cross Timbers biotic province of northcentral Texas lies within the northwesternmost part of the Trinity River Basin. It consists of a rolling to hilly topography which is deeply dissected and characterized by rapid surface drainage. Numerous artesian springs were present throughout the zone. Although classified by some as a prairie (Tharp 1926), others (Weaver and Clements 1938; Dyksterhuis 1948) have considered the cross timbers a true woodland, arguing that it represents an extension of the East Texas Austroriparian forest. The latter interpretation is accepted for this report. The primary factor behind this extension is evidently the presence of aquiferous "Woodbine Sands," which permit greater moisture penetration than the clays of the surrounding Blackland Prairie. This soil-hydrology relationship thus supports a savannah-like setting.

The soil mantle in the area is composed of alfosols which have developed on the Woodbine Sands, the basal group of the upper Cretaceous series. The former display "loamy surface layers with mottled gray, red, or yellow cracking clayey subsoils" (Lynott 1977:19). Due to extensive historic utilization of the cross timbers (primarily for agriculture and timbering), erosion has considerably altered the climax vegetation communities that once existed.

Biotically, the Cross Timbers can be divided into upland, bottomland forest, and transition zones. Upland regions in the Cross Timbers today consist of three settings. The first, open grasslands, are situations where land has been cleared of understory vegetation within the last century. It has been noted that "in heavily grazed pastures, the tall grasses have been replaced by buffalograss, Texas grama and other grasses of lower productivity" (Urbanovsky 1972:24).

The second consists of scattered stands of invading mesquite savannah which are concentrated adjacent to drainages where erosion has been extensive.

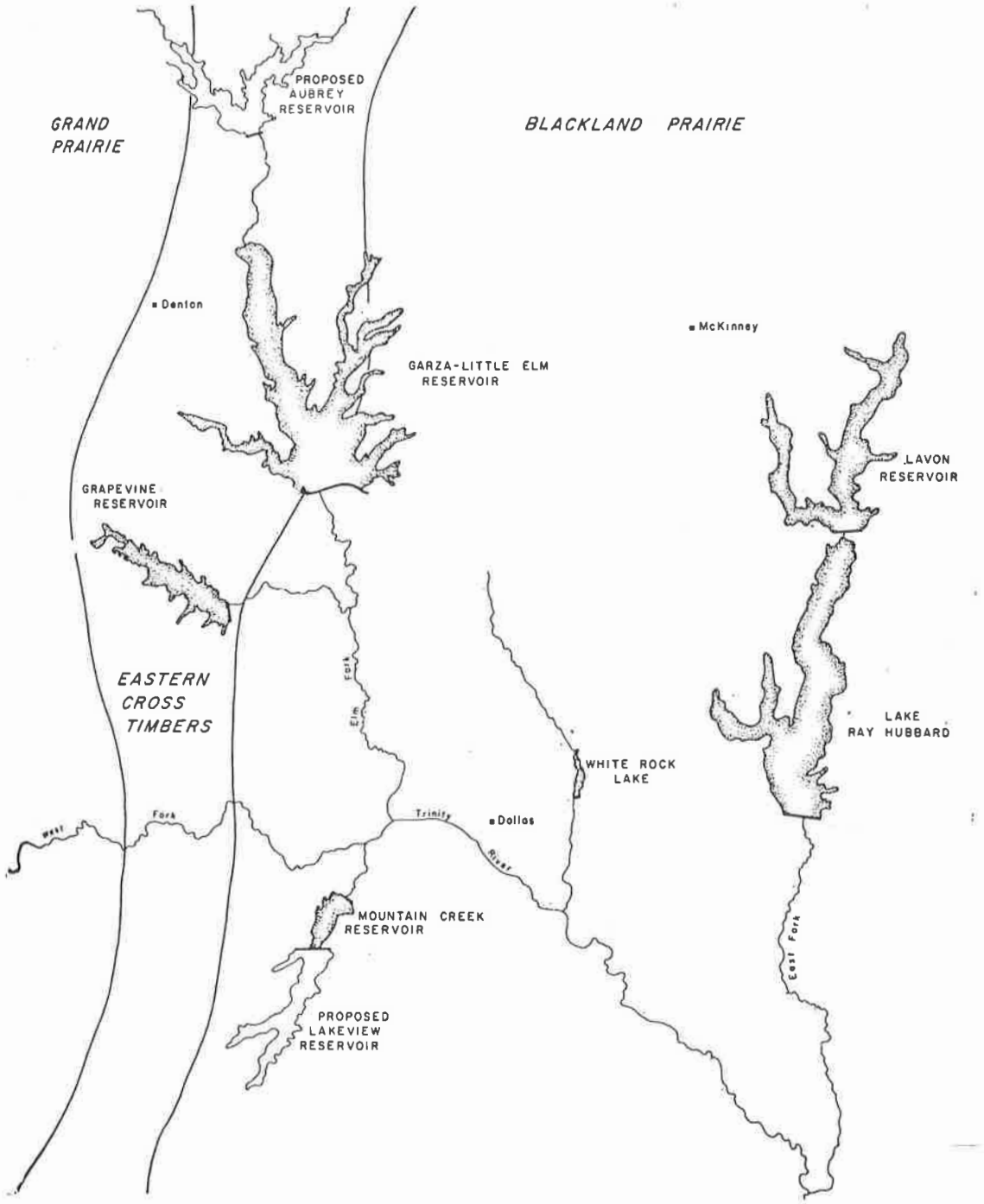

Figure 2. Major Biotic Provinces in the Project Area.

The association is composed of mesquite, lotebrush, juniper, and other woody vegetation.

Other areas are dominated by stands of oak. These display an overstory consisting of postoak, blackjack oak, shinnery oak, and live oak, with understories including big bluestem and little bluestem, hooded windmill, sand lovegrass, and a number of legume and forb species.

Studies conducted on relict stands in the Texas Cross Timbers have determined that the majority of climax uplands, prior to historic dessication, were covered by a postoak and blackjack oak vegetative community arranged in a savannah-like environment. The understory included little bluestem and big stem grasses, Indiangrass, sideoats grama, tall dropseed, and hairy grama.

The bottomland forest associated with the Trinity River in the Eastern Cross Timbers displays fauna and flora similar to the bottomland forest in the Blackland Prairie. The constituents of the Cross Timbers bottomland parallel those presented for the Blackland Prairie later in this section.

Within the Cross Timbers environment, terraces and upland slopes can be considered transitional microzones between upland and bottomland forest environments. The former are representative of the upland-bottomland forest transition within the Trinity River Basin. The latter occur between upland and bottomland forest microzones in proximity to secondary drainages. Both features characteristically display a mixture of elements associated with adjacent microzones, with species dominance dependent primarily upon soil, slope, and runoff.

Few Cross Timbers upland plant species probably had economic potential for prehistoric populations. These regions would have been dominated by grasses of little nutritional value. Although oaks were present, they would have been more abundant throughout the bottomlands. Thus, it is likely that most aboriginal plant exploitation activities in this province were concentrated in the bottomland forests. Here, not only acorns and pecans would have been relatively dense, but a number of wild fruits such as haws and plums would also have been available.

Since the bottomland environment was the most economically productive microzone within this province, it also is likely to have been the major locus for animal habitation, and aboriginal hunting probably concentrated here as well. Economically significant animal species that would have inhabited upland areas within the Eastern Cross Timbers are difficult to identify since most species would have exhibited a tendency to utilize the bottomland forest for seasonally available resources. Larger animals such as deer, coyote, bobcat, cottontail, rabbit, and turkey would have utilized all three microenvironmental zones on a seasonal basis; beaver, opossum, and squirrel would have been present principally within the bottomland environment year-round basis.

Blackland Prairie

Topographically the Blackland Prairie is usually characterized as a gently rolling grassland; for the purposes of this study three microenvironmental/ topographic zones can be distinguished: uplands, bottomland forests, and transitional microzones.

The biotic classification of the climax Blackland Prairie uplands, as well as associated species composition, depends primarily upon the source consulted. It has generally been classified as a tall grass prairie similar in composition to that which extends along the western extreme of the larger Northern Temperate Grassland of North America (Shelford 1963; 220). However a review of the studies conducted in this biome indicate disagreement concerning climax characteristics. (Dykstehuis 1948; Blair 1950:98; Tharp 1926; Weaver 1968).

One recent study of the Blackland Prairie (Collins, et. al. 1975) indicates that the biome contains relicts characteristic not only of the tall grass prairie, but of the true grass prairie (defined by Clements 1920) and the coastal prairie (defined by Clements and Shelford 1939) as well. In addition, unique elements uncharacteristic of all previously defined Prairie types were reported.

On the basis of the latter study two dominant plant communities were delineated in association with "Wilson-Crockett Burleson" soils along the Trinity River. The Sorghastrum-Schizachqrium community stretches from the Trinity River west to the Colorado, with little bluestem composing 81% of recorded vegetation. Big bluestem, Indiangrass, Florida paspalum and (*Manisuris cylindrica*) were also reported from all investigated locations.

The soils of the Blackland Prairie are undulating, alkaline to slightly acid, and developed primarily upon Upper Cretaceous (Gulf Series) marine marls and chalks (Meade, Chervenka and Greenway 1974). Distinguished formally as vertisols and alfisols, in normal undisturbed conditions such soils support a heavy ground cover. This situation increases water absorption dramatically, thus reducing erosional processes. However, due to the high fertility of these soils, erosional factors effecting Blackland Prairie uplands have been accentuated. "Until about 1880 the Prairie was used almost exclusively for grazing; today over half of the area is under cultivation, one-third is in pasture or meadow, and the remainder is divided between forests and open or brushy range" (Urbanovsky 1972:24). In the Dallas area, urbanization is the most significant land use practice. Land modification has resulted in degradation of the dominant grass species, primarily in upland and upland slope areas. In addition, historic use has also contributed significantly to a cycle of erosion accompanied by arroyo cutting which is evidenced throughout the prairie today. As a result; now "...the Blackland Prairie exhibits the highest average rate of erosion in the Trinity River watershed. Severe erosion in cultivated areas is the major source of sediment. In many of the smaller watersheds, sediment deposition on densely vegetated streambanks has increased flood frequencies

as much as 50 percent through reduction of channel capacities " (Urbanovsky 1972:27).

Due to historic land practices in the Blackland Prairie it is reported that:

> In heavily grazed pastures, the tall grasses have been replaced by buffalograss, Texas grama, and other grasses of lower productivity. Mesquite also has invaded hardland sites, and post oak or blackjack oak increase on the medium to light textured soils. Most improved pastures have been seeded to grasses such as dallasgrass, common, and coastal bermuda...." (Urbanovsky 1972:27).

The bottomland forest of the Blackland Prairie province is considered the least disturbed of the three zones. It has been characterized vegetationally as a hardwood forest environment in which:

> Oak, elm, hackberry, cottonwood, ash, black willow, pecan, and other larger trees provide about 30% canopy. The over-story is denser immediately adjacent to the streams. Underbrush includes hawthorne, greenbriar, Alabama supplejack, peppervine, trumpet creeper, honeysuckle, grapes and berryvines. The herbaceous plant community is dominated by sedges, Virginia Wildrye, and rustyseed paspalum in shaded and wet areas. Drier open areas may be dominated by various combinations of beaked panicum, switchgrass, Indiangrass, big and little bluestem, eastern grama, vine-mesquite, and Florida paspalum (U.S. Department of Agriculture 1972:1).

The presence of forest elements within the prairie results from the extension into northcentral Texas of East Texas Austroriparian vegetation. This floral mosaic has become established along prairie drainages where runoff has been sufficient to meet the groundwater needs of the larger associated trees. As a result, the extent of the bottomland forest within the prairie depends primarily upon the size of drainage basins.

The bottomland environment within secondary streams which drain the prairie can be distinguished from the Trinity floodplain. Although both exhibit similar biotic elements, the former tend to be classified as true hardwood floodplain forests. These display higher species diversity and density than the gallery forests which line the secondary drainages adjacent to the floodplain. Along the Trinity River the hardwood forest is distributed throughout the extent of the floodplain with greatest density exhibited as the drainage channel is approached. Within secondary drainage locales and in the vicinity of stream headwaters, forest elements are characteristically restricted to areas where sufficient water can be acquired. Typical overstory dominants in these latter areas include oaks, pecan, elm, and hackberry.

Upland slopes can be designated as transitional microzones between upland and lowland Black Prairie regions. Here, a mixture of the two adjacent grass communities is thought to occur, with dominance being dependent primarily upon slope and soil moisture.

A second type of upland slope can also be delineated for regions of the Blackland Prairie where uplands grade into the bottomland environments associated with secondary drainages. Here, typical Austroriparian elements mixed with grasses and associated with prairie uplands are present.

Along the Trinity in the Blackland Prairie, transitional zones are formed by valley edge Pleistocene terraces which support plant associations similar to the Eastern Cross Timbers (Krout: personal communication). Post oak, blackjack oak, winged elm, hickory and other species dominate these sandy terrace deposits.

In terms of human utilization of the Blackland Prairie, it can be concluded that plants in upland areas were of little prehistoric economic value since most were inedible. Their primary importance likely was based upon the animal population they supported (Lynott 1977:30). Major upland prairie mammals of value to prehistoric hunters included rabbit, red fox, coyote, deer, and more than likely, buffalo.

In respect to the utilization of bison as a source of subsistence, historic accounts as well as archaeological information stress that bison occupied the Blackland Prairie prior to and during the historic period. Extensive herds were present in Navarro County during 1845, especially on the west side of the Trinity River between Chambers and Richland Creeks (Athens Daily Review 1970); an earlier account from Navarro County also indicates that large bison herds were encountered along Chambers Creek ten miles south of Corsicana, Texas during the 1840's (Love 1933). In Ellis County during 1847, an extensive herd of bison in the vicinity of Waxahachie Creek was noted extending out for several miles onto the adjacent prairie (Ellis County Historical Museum and Art Gallery Inc. 1972). During the 1850's, a herd of bison exceeding 1000 in number was noted in Anderson County near the west bank of the Trinity River (Bradford and Wood 1901). An historic account from Dallas County (Cutchin 1964) declares that bison were quite numerous here prior to 1850. Following that year, however, bison were not frequently encountered east of Fort Worth in Tarrant County.

Bison remains have been identified in prehistoric archaeological contexts on the Blackland Prairie at a number of locales. Harris and Harris (1970) report a bison kill site which dates to the late 1400's on Dixon Branch Creek east of White Rock Lake in Dallas County. The remains were associated with Fresno style projectile points. Sorrow (1966) described a bison bone from the Pecan Springs site which is located on a terrace remnant in the Trinity River bottomland in Ellis County; a radio-carbon date of A.D. 1 $\pm$ 130 has been ascribed to the site. Richner and Larson (1978) note the recovery of bison bone from a site which was exposed in a cut-bank of the Trinity River in Henderson County. The bone was associated with ceramics as well as with Gary and Scallorn projectile points. At an additional site in Henderson County bison bone has been found assoicated with dart points (McClintock: personal communication). The latter two sites are found in zones of biotic transition from prairie upland to forrested bottomland.

On the basis of faunal elements in archaeological contexts in the Blackland Prairie, it appears that most larger food-yielding game species concentrated

within the bottomland forest. These include deer, gray fox, racoon, opossum, cottontail rabbit, and squirrel. Deer in particular demonstrate a preference for forested regions with sparse canopy coverage. This setting permitted the growth of low understory vegetation which were browsed. In addition, transitional microzones next to forested bottomlands afforded easy access to more protected timbered regions as well as browse.

According to early historic accounts, wild turkeys occurred in significant numbers throughout portions of bottomland forests. Turkey habitats also include upland and transitional regions of the prairie. They were present in these areas in greatest numbers from August to October when grass flowered.

Exploitable riverine resources consisted of fish and shellfish. Of the former, multiple species of sunfish, catfish, and bass were present in bottomland forest drainages, with single species of drum, shad, buffalofish, and crappie also reported. It has also been noted that "...Gathering riverine shellfish would be possible in major drainages throughout most of the year in the Blackland Prairie. Shellfish could be collected at low water periods from pools in the creek beds or streams themselves" (Lynott 1977:36).

In upland regions within the Blackland Prairie and the Eastern Cross Timbers, the contemporary biotic variances between these provinces can be related primarily to geologic criteria and recent human activities.

On the basis of information from the Eastern Cross Timbers it can be assumed that prior to extensive utilization of upland regions, the transition from the Blackland Prairie to the Eastern Cross Timbers appeared less abrupt than it does today. The extensive stands of oak and mesquite associated with thick greenbriar vegetation that are now evidenced throughout upland and upland slope regions of the Cross Timbers attest to a disclimax situation promoted by continuous historic manipulation of the natural environment.

Both the Eastern Cross Timbers and Blackland Prairie presented a diverse set of plant and animal resources for the prehistoric hunter/collectors of the area. In general terms the uplands of both zones contained far fewer biotic resources for human consumption compared with the transitional and bottomland habitats. However, the uplands provided abiotic resources not generally available in the bottomlands, especially lithic deposits for chipped and ground stone tool manufacture. The bottomlands were similar with an array of food resources available for exploitation.

As discussed later, the majority of known archaeological sites in the city occur in the transitional zone. The bottomland also exhibits high site densities, while uplands away from water exhibit lower site densities. This pattern is to be expected given the resources within the environmental zones and the prehistoric technology available to exploit them.

REGIONAL ARCHAEOLOGY

The distributions of prehistoric sites, the different settlement systems which unite these individual campsite locations together, and the changes in prehistoric economy during a year and throughout time are not adequately understood based on information within the City of Dallas. Moreover, the boundaries of Dallas do not constitute a natural environmental zone (Skinner 1974) and it is anticipated that the prehistoric inhabitants availed themselves of a larger area. Therefore this section presents a summary of relevant aspects of archaeology from this region of northcentral Texas. In order to adequately understand the archaeology a brief history of past investigations is presented.

Summary of Past Investigations

In the late 1930's and 1940's, interested amateur archaeologists began collecting artifacts and systematically recording archaeological sites from the greater Dallas area. These individuals usually worked alone, although at times they joined forces to engage in the excavation of sites; finally in December of 1940 they joined together to form the Dallas Archeological Society (DAS) which continues to be active today. Provision was made for regular publication of a newsletter, called The Record, which includes club news and reports on archaeological investigations by club members. Their stated purpose was "...to form an organization where its members could study the Indians of Texas...and properly collect and catalogue their artifacts found from sites in north central Texas" (The Record 1964).

The DAS has continued, since its inception, to be an important factor in recording archaeological sites in the Dallas area. Their site information and artifact records have been invaluable tools for professional archaeologists, and, in fact, are the foundation for archaeological site data presented in this report. It is important to note that the DAS has recorded data from some 275 sites surrounding the Dallas area - 116 of which are within the city limits (Figure 3). These data were used to support the establishment of the various Trinity River cultures.

Archaeological research conducted by DAS members concerns the whole of the Three Forks Area of the Trinity River Basin. On the East Fork, amateurs were responsible for the earliest reported research, conducting surveys of the Lake Ray Hubbard and Lake Lavon area as early as 1936 (R.K. Harris 1936; Lester Wilson 1946). These surveys led to excavation and testing of several sites in the area. In fact, it was amateurs who first described the unique feature of some Lake Lavon sites, those large circular depressions. They also participated in the salvage work done by the Smithsonian Institution later at Lake Lavon and at Lake Dallas.

Local amateurs joined with professional archaeologists of the Texas Archeological Salvage Project to survey the Forney Reservoir. The results of

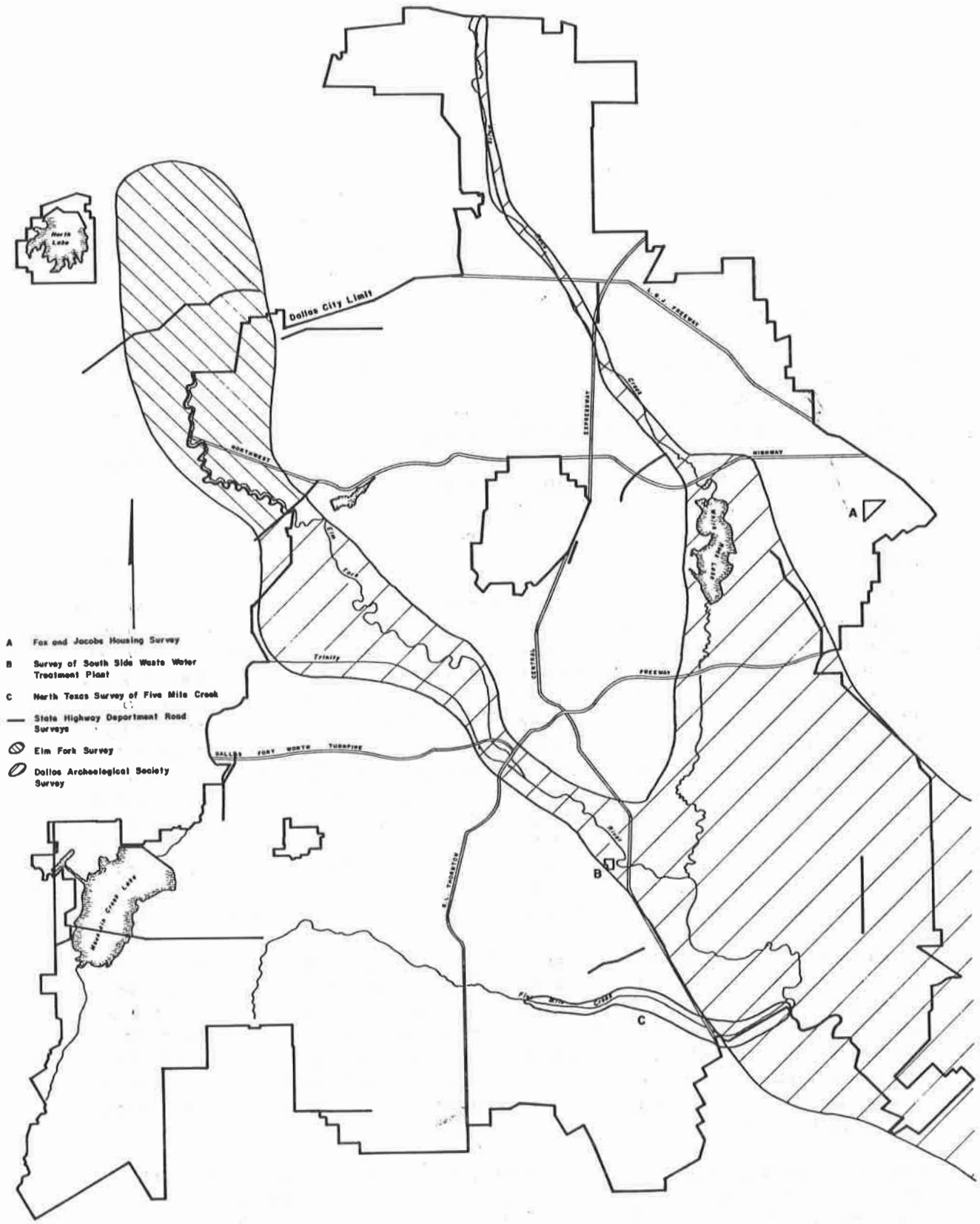

Figure 4. Areas in the City of Dallas Where Archaeological Surveys Have Been Undertaken.

information is used to illustrate the changing lifestyles of prehistoric peoples.

The stages which chronologically order this region provide a framework within which human occupation in Texas is described. The stages are:

Paleo Indian	11,000 B.C. to 5,500 B.C.
Archaic	5,500 B.C. to A.D. 500
Neo American	A.D. 500 to A.D. 1,600
Historic	A.D. 1,600 to present

Dates associated with the stages reflect generally accepted chronological frameworks although in actuality, some overlapping may occur between the stages, i.e., Paleo Indian manifestations may have persisted in one locality while those of the Archaic may have appeared at the same time in another locality. These points are taken into consideration as the different stages are discussed. Since this study is only concerned with prehistoric occupations, the Historic stage is not discussed.

Paleo Indian

This stage represents the earliest human habitation in North America, marked from that point in time when man first migrated to the New World from the Old World. This period also marks the latter stages of the Pleistocene (Ice Age), a time when some large and now extinct animals roamed North America and when the environment was wetter and cooler than today. Our only link to the humanity of this period is at the places where they camped and left durable artifacts, particularly of stone and bone. Such artifacts have been found in the Dallas area near the surface of eroding floodplain edges of the first, second, and third terraces (Figure 5). With third terrace representing the older, and truly ancient terrace deposits, the majority of Paleo Indian sites are exposed in the second terrace deposits and are correlated in time with other known Paleo Indian occupations. Though we know very little about the Paleo Indian period in the Dallas area, we can hypothesize the lifestyle of Paleo Indian peoples based on evidence from surrounding regions.

In discussing the lifeways of the Paleo Indian, consideration must be given to the aforementioned fact that the climate, vegetation and fauna were different from that of today. The cooler and wetter climate supported a woodland environment and surface water was abundant. Large animals which became extinct by the end of the Pleistocene, and generally most other animal resources, were greater in number. However, sometime between 9,000 and 6,000 B.C., the climate and environment changed to a drier grassland environment (A.H. Harris 1977:21).

The Paleo Indian Stage is subdivided into short time periods on the basis of certain artifacts. These artifacts reflect a lifeway organized around the hunting of herd animals, and the naming of certain point styles relates to the location where such artifacts were first systematically excavated e.g., Clovis, New Mexico; Folsom, New Mexico; Plainview, Texas, etc. When combined with site location and effective environment; it is possible to

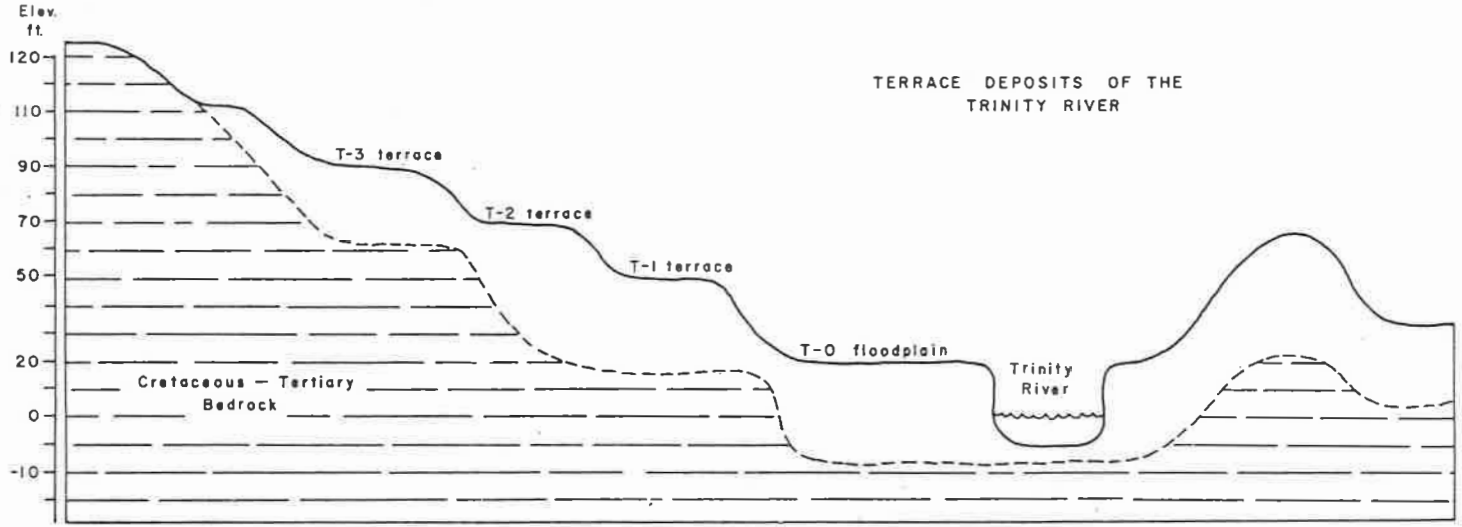

Figure 5. Pleistocene Terrace Deposits of the Trinity River.

reconstruct Paleo Indian lifestyles and subsistence patterns. The well known Clovis points (Figure 6) are considered to have been made between 9,500 - 9,000 B.C.. These Clovis hunters exploited the last of the large animals before their extinction (VanDevender and Wiseman 1977:13). Such animals as mammoth, ancient bison, horse, camel, giant sloth and tapir were hunted and provided an important part of the diet. The Lewisville Site located in our study area, with its Clovis point in association with radiocarbon dated charcoal, indicates the possibility that the beginning date for the Paleo Indian could be much earlier than generally accepted.

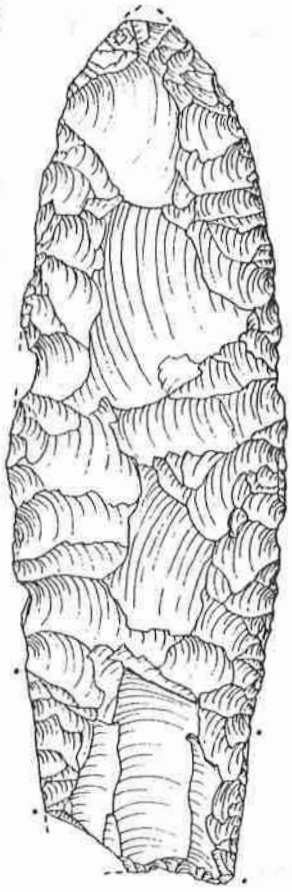

Figure 6 Clovis Point
Actual Size

Folsom signals a somewhat later cultural manifestation than Clovis, from 9,000 - 8,000 B.C. (Figure 7). The woodland environment decreases during this period but animal resources continue to be of a wide variety although bison were beginning to decrease in number.

The last Paleo Indian period is manifest by points which indicate a parallel flaking tradition, such as Plainview, Meserve and Scottsbluff (Figure 8). A change in climate and environment, as well as faunal and floral resources, marks this period which is dated from ca. 8,000 - 5,500 B.C.. Surface water began drying up, the climate became, overall, much warmer, and the diminishing forest areas become vast, open grasslands. The Field Ranch Site (Jenson 1968) located on the Upper Elm Fork drainage was apparently occupied throughout the entire Paleo Indian stage. The site contained two hearths which are archaeologically defined as areas of burned rock and/or earth, where remains of human occuation, e.g., tools and faunal remains are found. Seven projectile points, including Clovis, Folsom and Plainview were recorded (Lynott 1977: 81).

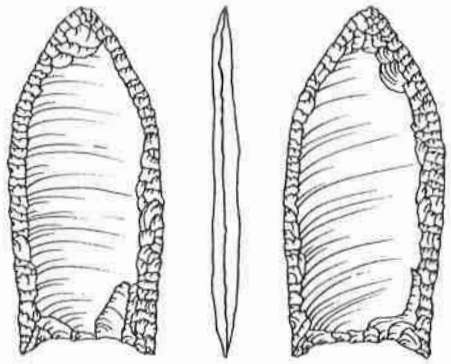

Figure 7 Folsom Point - Actual Size.

Although the Paleo Indian stage generally has been equated with big game hunting, it is marked by an overall hunting and gathering adaptation to the environment. Occasional large game kills were supplemented with riverrine (fish, mussel and turtle) and small mammal resources. However, though hunting was undoubtedly an important activity, it was the staple plant foods which probably sustained these populations over thousands of years (Shafer 1977:164).

Nomadic bands of Paleo Indian hunters and gatherers were only small groups of from two to three families, who roamed a large area or territory, camping at spots which were attractive to them. There were no permanent campsites as such. Thus archaeological sites for the Paleo Indian can be expected, and indeed have been reported near rivers and small tributaries, but well above their regular overflow areas. Also, bluffs overlooking small streams were perfect sites for bison kills, for these large animals could have been herded or stampeded over the cliffs to their deaths, and then butchered and eaten.

Such sites can be expected to yield chipped stone scrapers, points and other discarded refuse of human occuation typical of those found widely distributed throughout the Southwest. It is interesting to note that the Paleo Indian points found in the Dallas area are made of chert exotic to this area and indicate either a wider range of wandering by the nomadic groups, or a trade system with groups in other areas where the flint was available.

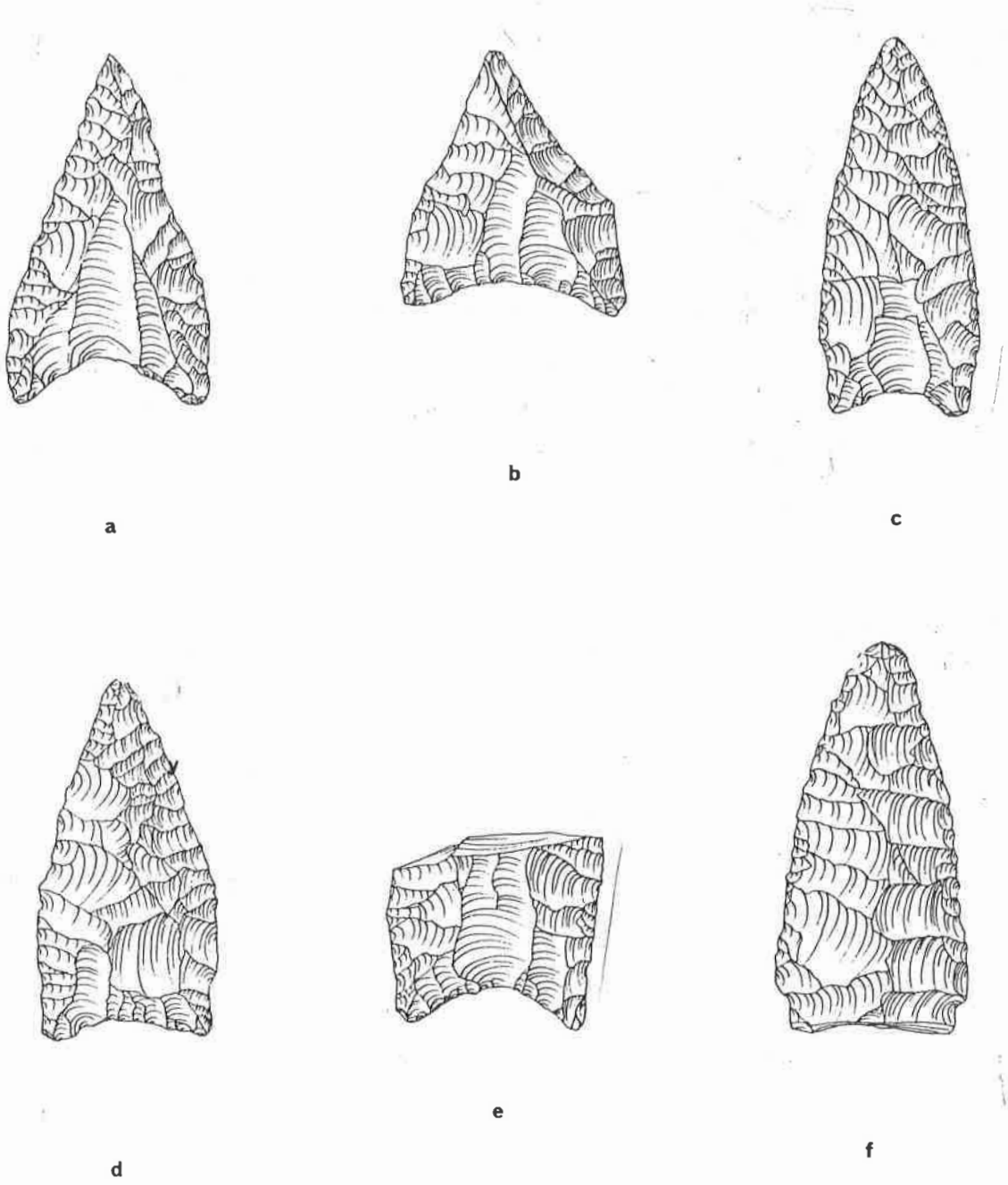

Figure 8. Late Paleo Indian Projectile Points. a-c,e -Plainview, d — Meserve, f — Scottsbluff.

In summary, there is a vast gap in the knowledge of our prehistoric past with relation to the Paleo Indian stage. A few isolated Paleo points have been recorded from the Dallas area, but these do not represent undisturbed sites containing other contextual Paleo material. The goal is to find Paleo Indian sites in situ, i.e., intact and/or buried, which can reveal to us how these early people lived and utilized their environment. One such small site can be of greater importance than a whole array of isolated artifacts.

Archaic

The Archaic stage follows the Paleo Indian stage and continues until approximately A.D. 500. For many, the presence of stemmed dart points marks the beginning of the Archaic. At best, its beginnings can be said to be somewhere around 6,000 - 5,500 B.C.. This stage is marked, again, by the seasonal movement of small bands to harvest locally available foods rather than the earlier dependence upon the migration of large herd animals. Movement is more restricted than during the Plaeo Indian stage and there is more intensive plant and animal exploitation. Hunting focused upon deer, smaller mammals and collecting available riverine resources. Collecting of vegetal matter became more intense, not only for dietary purposes, but for use in weaving of sandals, baskets and nets for snaring animals. This adaptation is reflective of the change in the environment of Texas after 6,000 B.C. described above--from the moist, cool climate of the late Pleistocene to a drier, warmer climate associated with the present geologic period, known as the Holocene.

However, the Archaic in the Upper Trinity Basin is defined more on the basis of groups of artifact traits, rather than the adaptive strategies operating within this time period. This is due to the fact that there have been few controlled excavations of Archaic sites, and the available information is inconclusive as to adaptation. Artifact traits reflect changes in subsistence, and artifact manifestations include the appearance of grinding stones, pitted stones, Waco "sinkers" and dart points which were used with a spear thrower called an atlatl. Also included are large gouges and scrapers (Figures 9 & 10). Some of these artifacts have been differentiated and defined as early Archaic (Carrollton) and later Archaic (Elam) (Crook and Harris 1952, 1953, 1954, 1959; Kirkland, Harris and Hatzenbuehler 1949; Hughes and Harris 1951; Lorrain 1963, 1966). Such Archaic manifestations occur throughout parts of the Blackland Prairie and the Eastern Cross Timbers. Sites are usually found buried in the first terrace of the Trinity (See Figure 5) where a small tributary cuts through the terrace to reach the floodplain (Skinner 1972:178). Artifacts at these sites have been collected from the eroding terrace edges (Tl Terraces) and buried terraces which have been quarried by sand and gravel companies (Richner and Lee 1977:34).

Archaic sites include hunting camps, temporary hunting and gathering campsites, as well as quarry site locations, where stone was gathered and made into tools. Indeed, the Archaic sites within Dallas County indicate occupations of short duration with evidence of stone tools and the debitage (flint flakes) associated with tool manufacture.

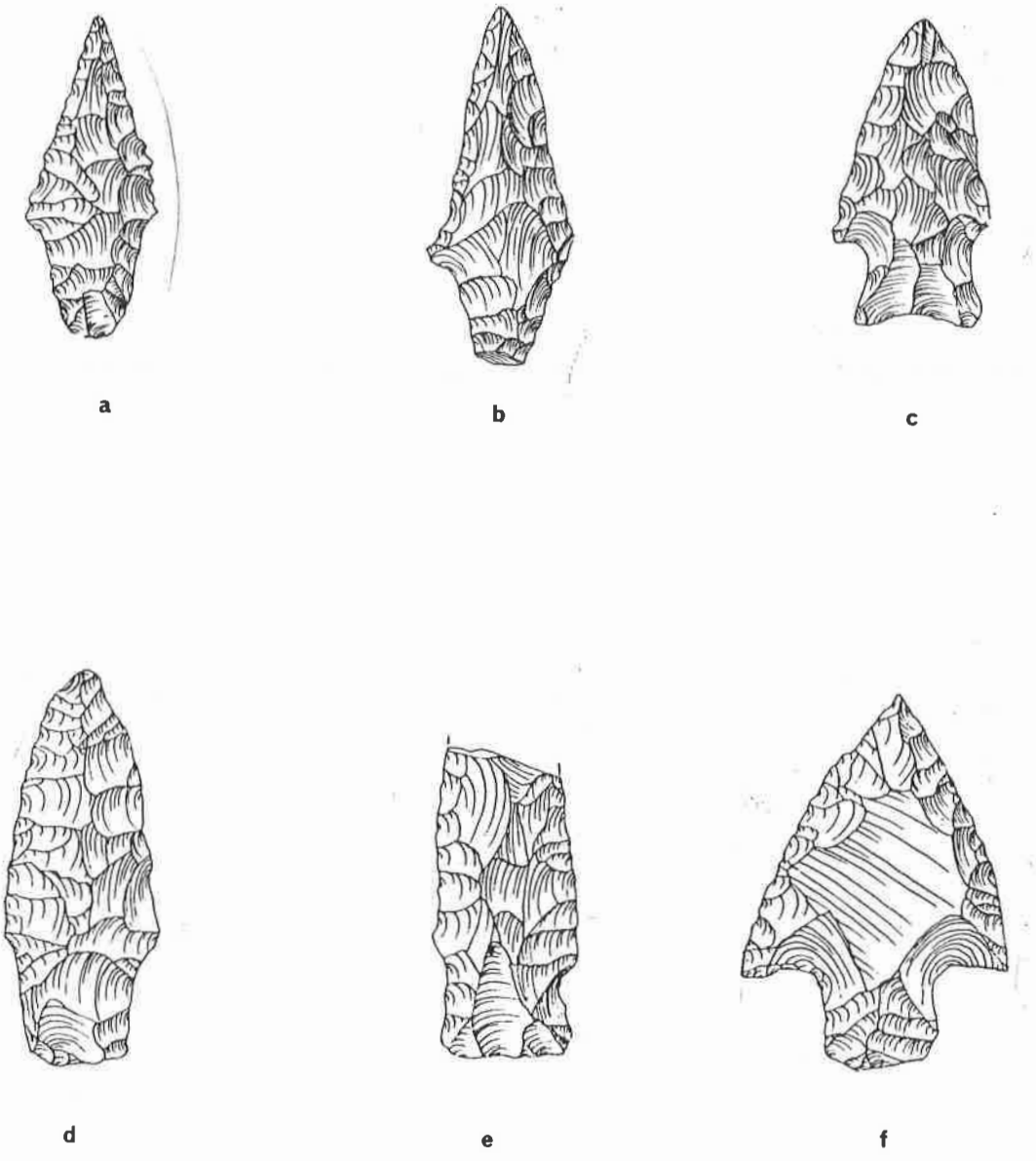

Figure 9. Archaic Stage Projectile Points.

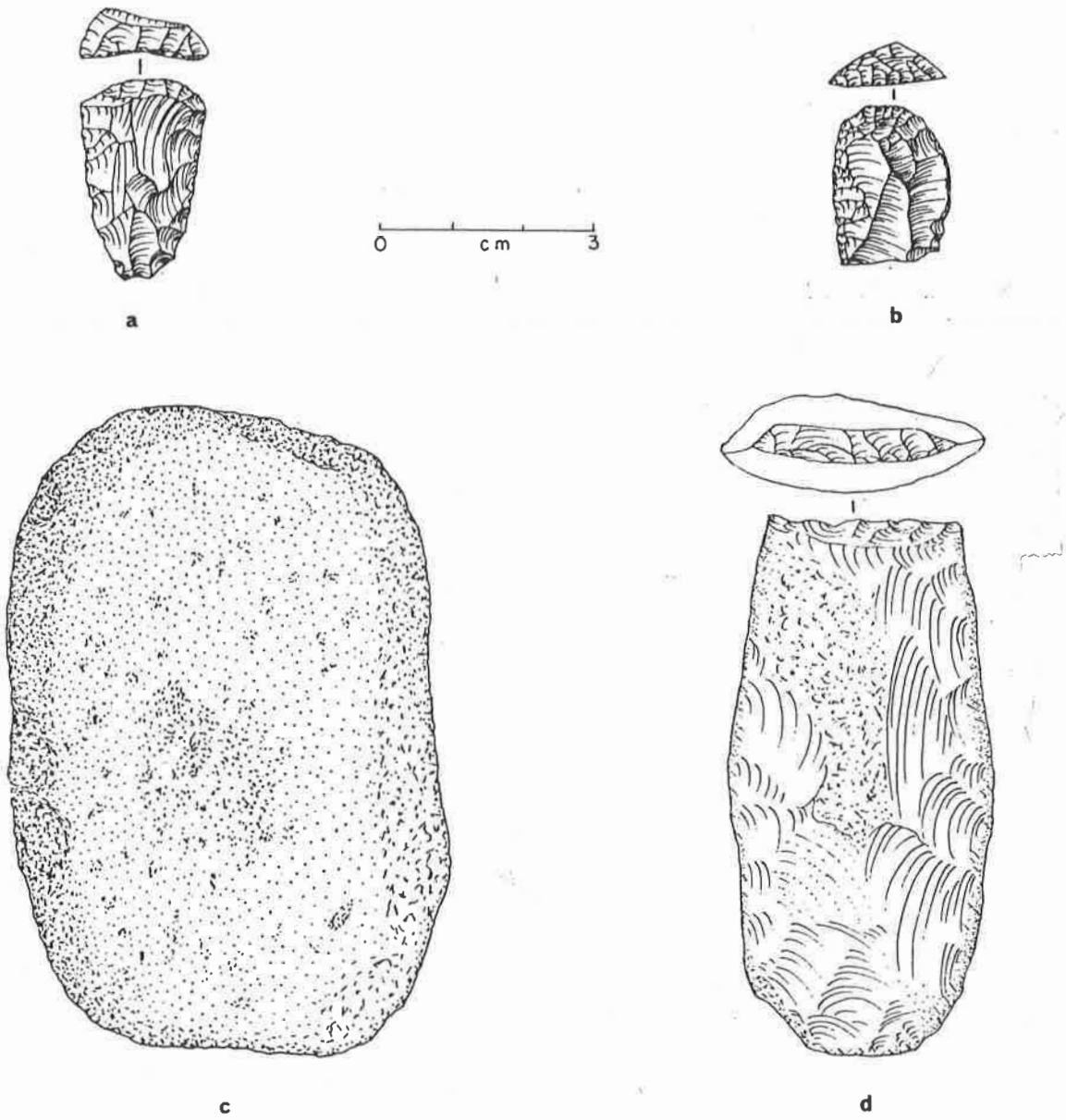

Figure 10. Archaic Stage Tools. a, b - End Scrapers, c - Pitted Stone, d - gouge.

Neo American

The third stage discussed here is the Neo American, spanning approximately the period from A.D. 500 - 1,600. This stage exhibits a significant shift in lifeways from those previously discussed, and is considered a period of increased stability in prehistoric man's economy. The Neo American is defined by a more settled lifestyle, with larger groups of people living in permanent campsites or villages. The bow and arrow is introduced and supplemented the atlatl for hunting. Manufacture of pottery is also introduced in the Neo American Stage. The settlement pattern has thus changed from seasonally occupied, open camps to more permanently settled villages associated with single occupation sites of short duration connected with hunting forays.

In the Neo American Stage, most regions exhibit extensive agriculture; however, in the area of the Upper Trinity, no indication of widespread agriculture has been found. More effective hunting methods can be argued, due to the use of the bow and arrow, and the gathering and processing of many varieties of floral resources became more intensified. Arrow, as well as dart points are represented in the artifact array, as are grinding implements (Figure 11). The presence of pottery in Neo American sites indicates that storage of foodstuffs was being practiced and such cultural trappings indicate a more limited movement pattern.

Neo American is represented best in this area, on the East Fork of the Trinity River by a series of sites which exhibit a unique feature: large, curcular depressions. The sites temporally span the period from 1,000 to 1,600 A.D. and exhibit all of the traits defined for the Neo American. Several of these sites such as the Dugger Site (Dawson and Sullivan 1973), the Sister Grove Creek Site and Sister Ridge Site have been reported and excavated (Lynott 1975). Excavations indicate that these sites are large, relatively permanent campsites located on low floodplain rises of the East Fork and its tributaries. They contain a wide range of stone artifacts indicative of the Neo American Stage, including both arrow and dart points. Ceramics are present but are generally limited, and appear to be a mix of Caddoan types from East Texas. These pits or depressions have been hypothesized to be anything from ritual or dance areas, to large house sites (Figure 12). In particular, the Hogge Bridge Site is a good example of this type of site (Stephenson 1952). Burials, with some grave goods and hearths occur at the larger of these sites, and faunal remains indicate a persisting dependence on bottomland resources.

Of some note, for the Neo American Stage, are bison kill sites. These sites cluster along secondary drainages of the Trinity: one example being Dixon's Branch of White Rock Creek. A series of kill sites, one with a bison exhibiting three Fresno arrow points in its rib cage, have been recorded (Harris and Harris 1970). It is believed that these secondary drainages are prime locations for such specific site types, where the buffalo could be driven off bluffs into creek valleys or creek channels.

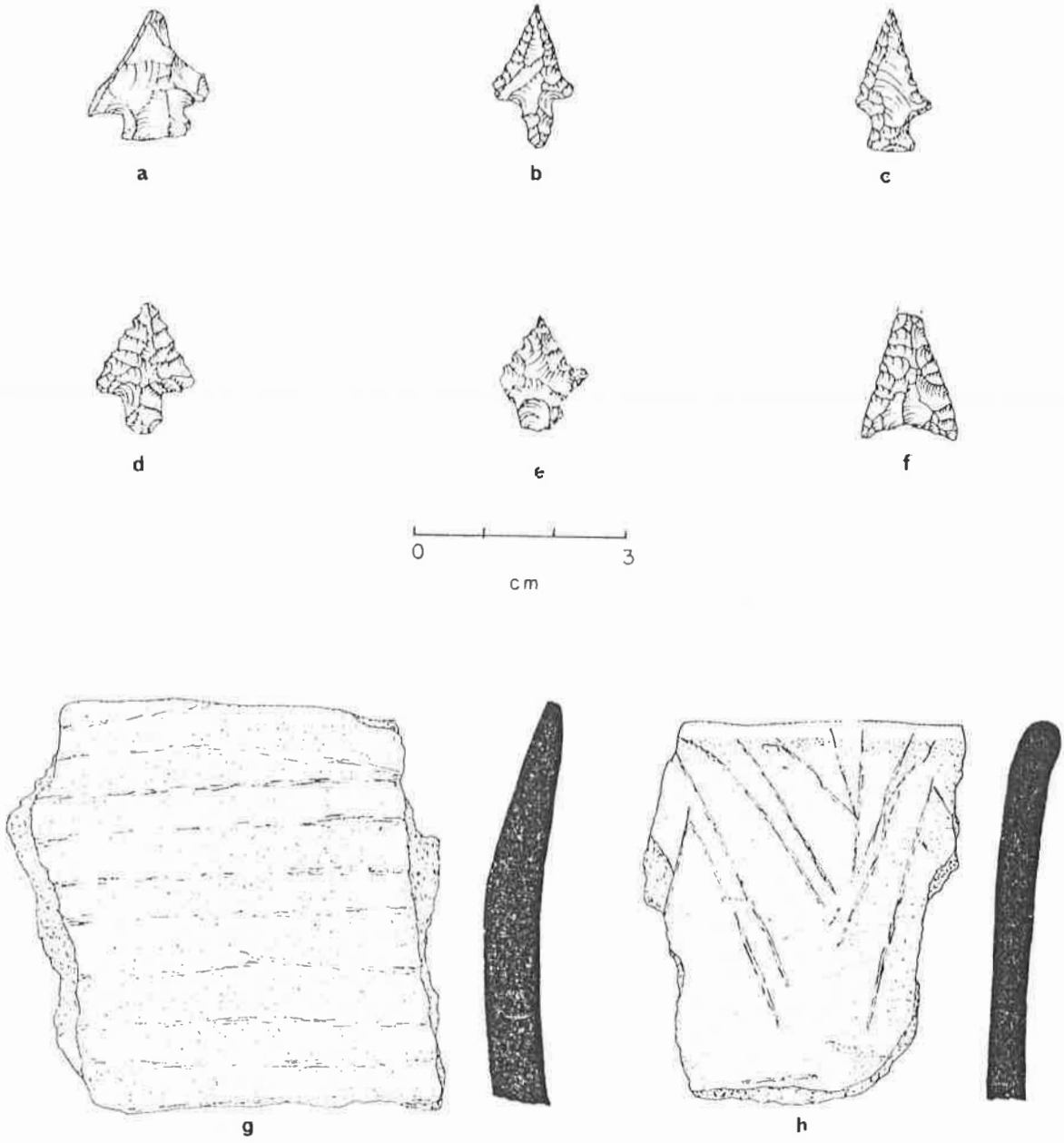

Figure 11. a-f- Neo American Stage Projectile Points, g-h- Early Neo American Incised Ceramics.

Figure 12. Possible Wylie Focus Pit at a Site on Richland Creek in Navarro County.

Several Neo American burials have been documented in Dallas County at a site which exhibits not only burials and associated grave goods, but also general village debris (Kirkland and Harris 1941; Hatzenbuehler and Harris 1949; Harris 1949). Grave goods include several turtle shell beads and a group of stone beads found in such a position as to indicate their use as a necklace.

While the temporal scope of this study encompasses only the prehistoric period, a brief summary of the protohistoric period is presented below. The prehistoric period terminates at A.D. 1600, but Anglo colonization did not begin in the Dallas area until ca. 1840. The intervening period represents the protohistoric stage about which relatively little is known.

A variety of Indian tribes utilized the Three Forks region of the Trinity River Basin during the protohistoric period. This included groups native to the area: Wichita (Tehuacana and Keechi villages); Caddo and a variety of groups from the Eastern United States who were forced to immigrate to Texas - Cherokee, Delaware, Kickapoo and others. Records concerning occupation from 1600 - 1800 are sparse, with slightly more data available after 1800.

By ca. 1800 the Anadarko branch of the Caddo occupied the Dallas area along with the Keechi, a subdivision of the Wichita. Remnants of the Cherokee, Delaware and Kickapoo tribes moved to the area ca. 1803 and vied with the Caddo for control. All these groups combined equestrian bison hunting on the Blackland Prairie and riverine mammal hunting on the Trinity with fairly extensive agricultural persuits.

In the late 1830's American military leaders decided to evacuate all Indians from the Upper Trinity area. General Rusk's volunteers burned out a Caddo village near present-day Arlington in 1838 and the remaining Caddos left the Upper Trinity area. In 1839 Cherokee and Delaware groups re-established a large village (ca. 1,000 persons) at the same location, which was totally destroyed by General Tarrant in 1841.

Protohistoric Indian occupation of the area declined rapidly after that time although a variety of hunting parties continued to exploit bison, deer and turkey until 1854 when all Indians were removed to a reservation on the Brazos River.

The Spanish and the French were very active in Texas during this time period. On the lower Trinity, the Spanish were settling, missionizing and trading, while the French had settlements on the Red River as early as 1716 (Sciscenti 1972:189). However, there is sparse evidence of Spanish or French settlement in the Dallas area, and it is generally believed that Spanish expeditions did not pass through the Upper Trinity area. Nevertheless, the discovery of a Spanish chain mail gauntlet and tabor, near Honey Springs in the southwestern portion of Dallas, gives evidence to some early Spanish contact. These artifacts seem to be associated with Spanish exploration of this portion of Texas.

While examination of the protohistoric occupation of the area was outside the scope of this study, site distribution is expected to parallel the prehistoric pattern which formed the basis for the archaeological probability zones presented in Section 4.

In summary, for all stages, archaeological data for the Dallas area is limited to a greater or lesser degree due to the limited scope of previous archaeological research. It is believed that many undiscovered prehistoric sites remain in Dallas. The occurence of out of context artifacts or the size of archaeological sites is not a useful measure of archaeological significance. What is significant for archaeological interpretation is accurate recording of artifact finds, including excavation of sites, both large and small, from which the behavior of prehistoric peoples can be extracted.

The least amount of information is available from the Paleo Indian Stage, therefore such sites warrant particular attention for research and investigation. The Archaic and Neo American Stages are fairly well documented, but again, systematic reserach has been limited and artifact oriented, consequently considerable information concerning the way of life of the prehistoric peoples who inhabited various parts of Dallas remains to be gathered.

This study provides for the City only a preliminary overview, with guidelines and methodology for further work. It is expected that future investigations will yield information which can allow us to understand the changes which occurred through time and why they occurred. Through our understanding of the ways in which prehistoric man utilized and adapted to his ecological zone, we should be able to better utilize and conserve that sime environment today.

SITE DESCRIPTIONS

Specific site types have been designated for this study on the basis of morphological characteristics, and on the basis of site location and artifact assemblages. Locations vary from upland, upland edge, terrace edge, floodplain rise and levees. The artifact assemblage from Upper Trinity Region sites may include a variety of projectile points (dart and arrow), bifaces, scrapers, hammerstones, retouched pieces, pitted stones, cores, and lithic debris category encompasses ships and flakes resulting from stone tool manufacture. Among site assemblages, a large variability exists in the density of particular artifacts. These site types will serve as a general scheme, which has been used for the entire Trinity River Basin and gives a frame to the areal prehistory (Richner and Bagot 1978). The relationships between site type and distribution have been used to shape and refine the archaeologically sensitive zones, which is the purpose of this study. Some site types represent more functions than others as discussed below.

Shell Lens (Figures 13 & 14)

A shell lens is a relatively thin layer of shells, in this case fresh water mussel shells, which are always found in floodplain sediments and exposed along channels or in man-made excavations. These lenses can be small or large areally (from 2-40 m. long) and are buried from 1 - 6 meters. Some shell lens sites exhibit repeated occupations, and various occupations are sometimes separated by a sterile layer of soil. To be considered a shell lens site, the shell concentration must be associated with at least one of the following features: charcoal, hearth, firecracked rock, lithic tools, ceramics, or lithic debris.

This site type is well known from the Three Forks Region of the Upper Trinity, with 8 such sites reported on the East Fork, and 73 reported along the Middle Trinity (Richner 1976; Richner and Bagot 1978: 154-160; 215-250).

Stages represented by this site type are from the Middle Archaic (ca. 2000 B.C. through the Neo American A.D. 1600), by a series of radiocarbon dates from the Middle Trinity (Richner and Bagot 1978). Artifacts associ-

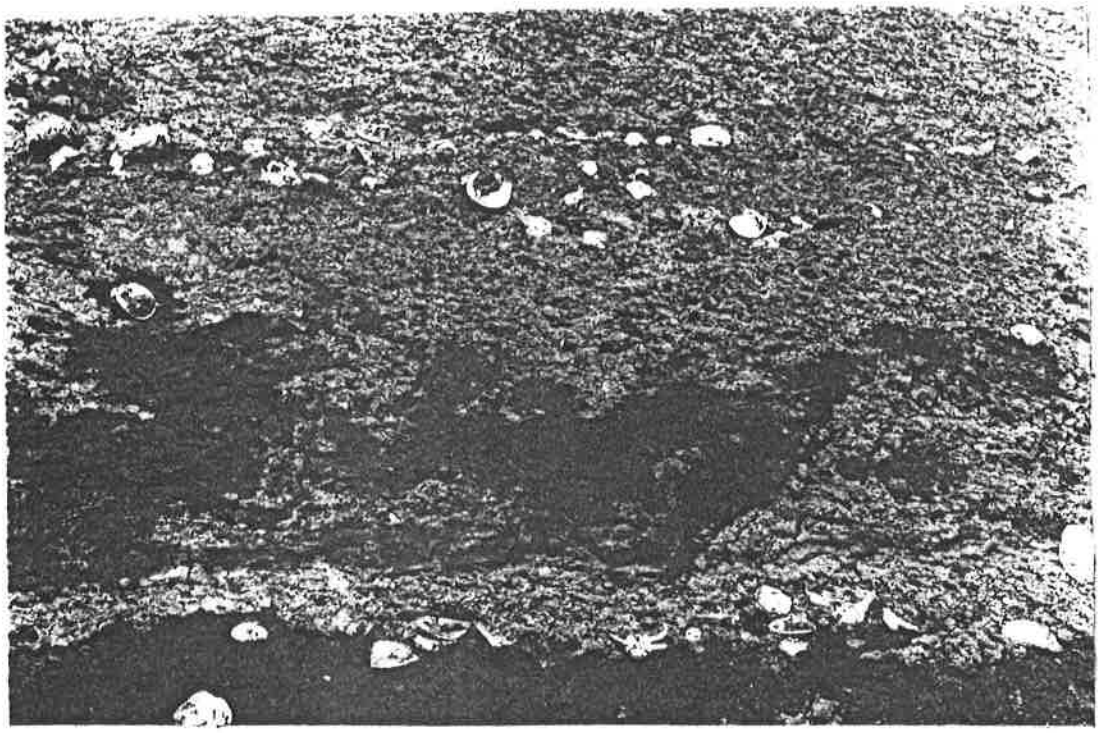

Figure 13. Portion of a Stratified Shell Lens Site.

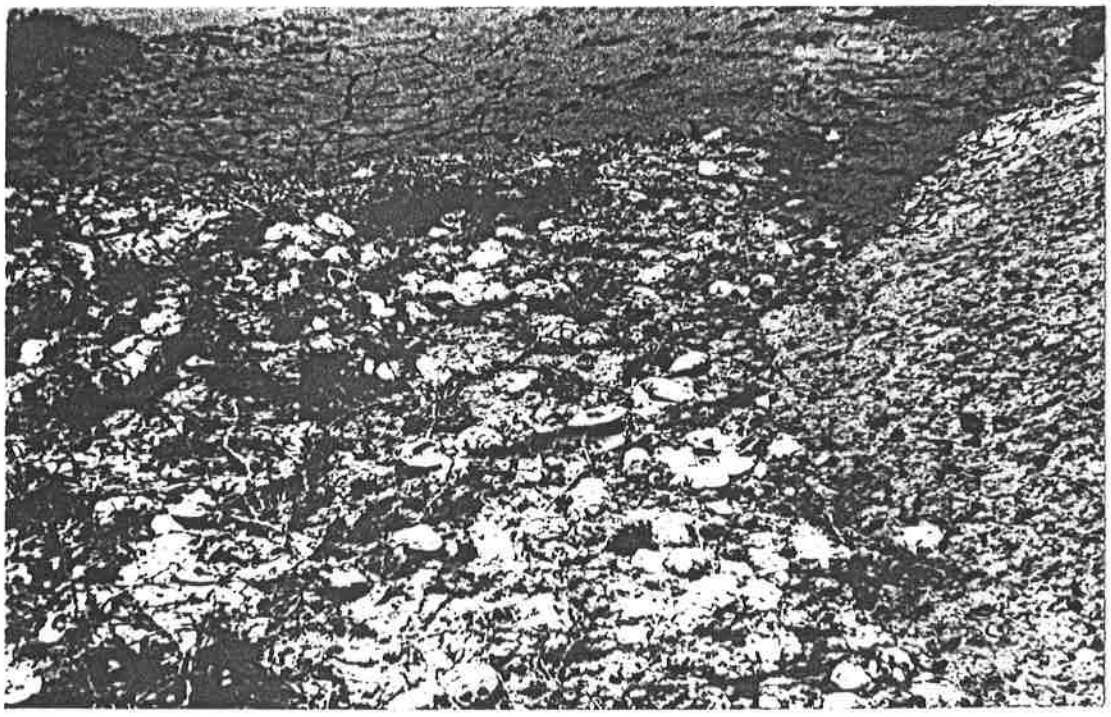

Figure 14. Typical Deflated Shell Lens.

ated with these sites are projectile points, bifaces, scrapers, ceramics and hammerstones. Of all the site types to be discussed, functions for shell lens sites can be discussed more positively than for any other. The basic activity at these sites is the processing and preparation of mussels for food; with the added activity of hunting revealed by the presence of animal bones (bison, deer, rabbit) and collecting, by the presence of pecan shells. There are several examples of shell lens sites within the Dallas area; some of which occur on the Elm Fork of the Trinity River. One of these sites, X41DL1 is eroding out of the west bank of the Elm Fork at a level of 1-2 m above the modern water level. It contains fire hearths associated with mussel shells and a few lithic artifacts (chips, flakes and one projectile point) (Hays 1972).

Midden Sites

Middens are defined as organically stained deposits containing prehistoric occupational debris. Decaying organic materials lead to the dark staining of the soil with which it comes in contact, and is reflective of trash and food debris.

The White Rock Spillway Site, 41DL83, is an example of a midden site with several burials and village debris. It is located at the spillway of White Rock Lake, 50 feet from the channel of White Rock Creek which drains southward into the Trinity River. The site was first discovered in 1932 and through excavations was found to contain flint artifacts (dart, arrow points, and scrapers), a broken metate (grinding stone), mussel shell, burned rock, and shell and grit tempered pottery all in association with 7 skeletons from 4 graves. All of the bodies were found in a flexed position e.g., knees drawn under the chin. Excavation of this site uncovered hearths as well as deer, buffalo, small mammal bones, and mussel shells. What appeared to be a string of 81 bone beads and 2 turtle shell beads were also found in association with 3 burials in one grave. The site is reported to be 96 x 120 meters and although most of the site was destroyed by the spillway, it is believed that a portion of the site remains intact, beneath the spillway (King Harris: personal communication).

Another example of a midden site is 41DL12 located on the west side of Carrollton Dam on the Elm Fork of the Trinity River. This site does not fall within the limits of the City though is of a type which can be expected to occur. This is a large site, measuring 45 x 180 meters; and has considerable depth, measuring 1 meter at its deepest point. The site was described as containing 2 small refuse pits with numerous stone artifacts, mussel shells and burned rocks, but neither bone nor ceramic artifacts (Figure 15). Stone artifacts include 2 small, stemmed arrowheads, one small triangle point and a limestone hand ax. A few flakes and bones were found. The artifact assemblage indicates a late Archaic occupation. A profile view of the site revealed the artifacts and shell in dark humus containing charcoal, with brown sand and clay underlying the two pits.

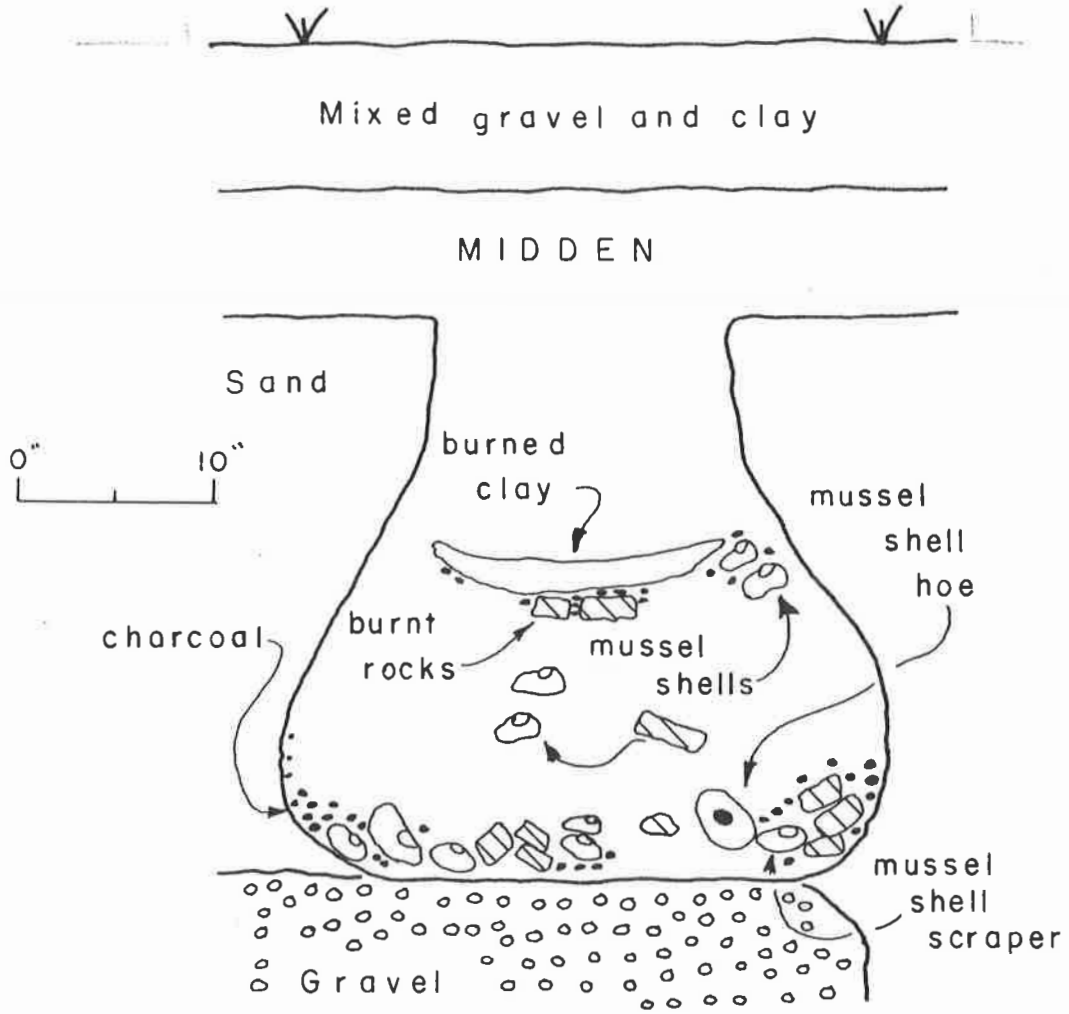

Figure 15. Profile of a Pit from Midden Site 41DL12.

Bison Kills

Bison kill sites are those locations at which bison were killed and butchered. It has been previously stated that such sites seem to occur along the small streams and tributaries of the Trinity, and where steep stream banks form natural areas for running the animals off to a catchment below. These sites exhibit bison bones in association with arrow and dart points, and a limited range of other lithic tools and debris.

Several such sites occur along Dixon's Branch, Ash Creek, Upper White Rock Creek, Duck Creek, 5 Mile Creek, 10 Mile Creek and Bear Creek (Figure 16).

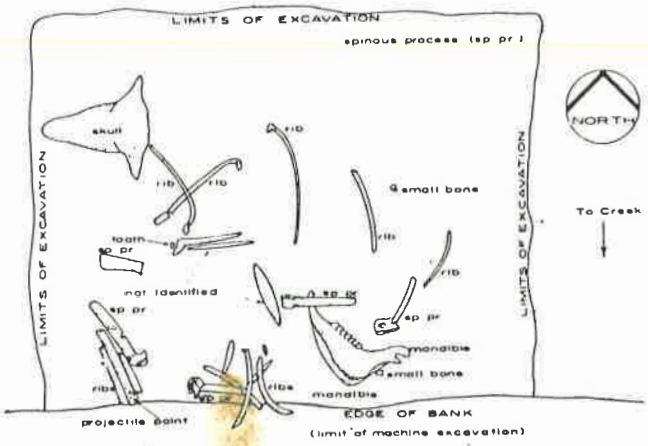

Figure 16. Plan View of Bison Kill Excavated on Denton Creek Northwest of Dallas. A triangular Late Neo American Point was Found between Two Ribs (Morris and Morris 1970).

The Dixon's Branch Bison Kill SIte (41DL40), located and excavated in the spring of 1962 (R.K. Harris and I.M. Harris 1970) is described here (Figure 17). The bison remains were found in the gray silt overlying the gravel bed of the creek. Inside the rib cage were found 3 small triangular points which are termed Fresno. Lower leg bones and the skull had been eroded away by the creek. Small flecks of charcoal were found with the bison remains, radiocarbon dated A.D. 1505 which reflects later prehistoric utilization of Fresno points by Indians in North Texas and the Southern Plains.

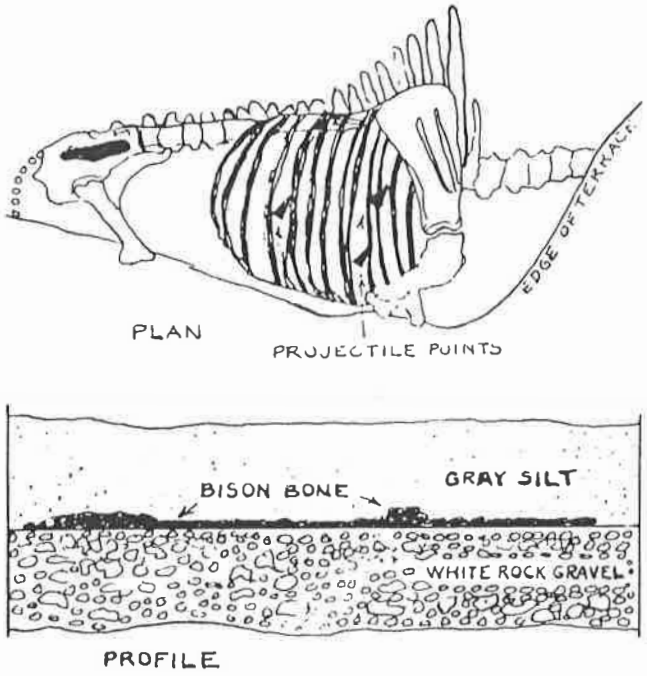

Figure 17. - Bison Kill at 41DL40.

Scatter Sites

The site type designated as Scatter is by far the most numerous type found in the Dallas area. By definition, a scatter is a surface site which exhibits artifacts of human manufacture, i.e., lithics and/or ceramics. This site type can therefore be indicative of various functions; however, the lack of excavated features limits functional interpretation. Varying topographic features are also exhibited within scatters as well as the complete time range discussed above. All kinds of artifacts are recorded for scatter sties and there is a wide variance in site size which suggests that a small as well as a large scatter should be described herein.

Small scatters probably indicate single occupations, because of the limited range of artifacts and the small area encompassed. We hypothesize an overnight stop or a camp made for the preparation of a meal and/or tool making, for there are many such small scatter sites within the study area. A site located on a rise on the west side of White Rock Creek is an example (41DL37). The site measures 45 by 55 meters and was first reported in 1936.

A portion of the site is now covered by a house and most likely little remains of archaeological potential; however, projectile points and numerous potsherds (red and brown in color and shell tempered) were collected and indicates an occupation from the late Neo American Stage. Mussel shells were also reported at the site. That is the total extent of the artifact and faunal assemblage, and is reflective of many such small scatter sites reported within the Dallas County area.

Large scatters on the other hand exhibit ceramic and/or lithic artifacts spread over a large area. Site 41DL69 is a very good example of such a site. It has been collected over a period of many years and has yielded thousands of artifacts, both lithic and ceramic, of a wide range morphologically, temporally, and culturally. The site is located on the edge of the first terrace of the Trinity River adjacent to old South Central Expressway and has been extensively disturbed by City sand quarrying, though it is felt by the investigators that much of importance still remains at the site. It measures 180 by 360 meters. Human bones have been reported, though disturbed to such an extent as to indicate only that burials were present at the site. The artifacts include several Plainview points (Paleo Indian), a wide array of Archaic artifacts (Carrollton gouges and points, Waco "Sinkers") and Neo American arrowpoints, as well as a drilled stone gorget, a gray steotite pipe, scrapers, bifaces, drills and gravers (Figures 18, 19, 20 and Table 1). A large number of mussel shells was recorded from the site as well as pieces of broken pottery, indicative of the Neo American Stage. Obviously this was an attractive site to prehistoric man and one that was occupied and reoccupied over thousands of years.

Chipped Stone Quarry

Generally speaking, quarry sites are considered to be those sites where stone is actually cut from natural outcrop situations. However, in the Dallas area, quarry sites are those sites where stone for lithic tools was selected from among cobbles occuring naturally in cobble fields, a holdover from the Pleistocene or even Pliocene age (Menzer and Slaughter 1971). These cobble fields occur in upland settings within Dallas County.

Quarry sites can be described as prehistoric workshops where chippable stone was gathered and partially worked. Such partially worked rocks are called roughouts. Thus much debitage, or flakes and chips, should be associated with these prehistoric quarry sites.

Of the total number of known quarry sites in Dallas County, 12 upland quarry sites occur in the Mesquite-Seagoville area along the Trinity River between the mouth of Prairie Creek and White Rock Creek (Hatzenbuehler 1942). These particular quarry sites exhibit a large amount of broken and unbroken cobbles as well as chips, flakes, and unfinished tools. They range in size from 55 by 115 m to 230 by 550 m in area and are currently utilized for cultivation and pasture. Site 41DL38 is one example from this group; it is located on Dixon's Branch of the White Rock Creek drainage in an

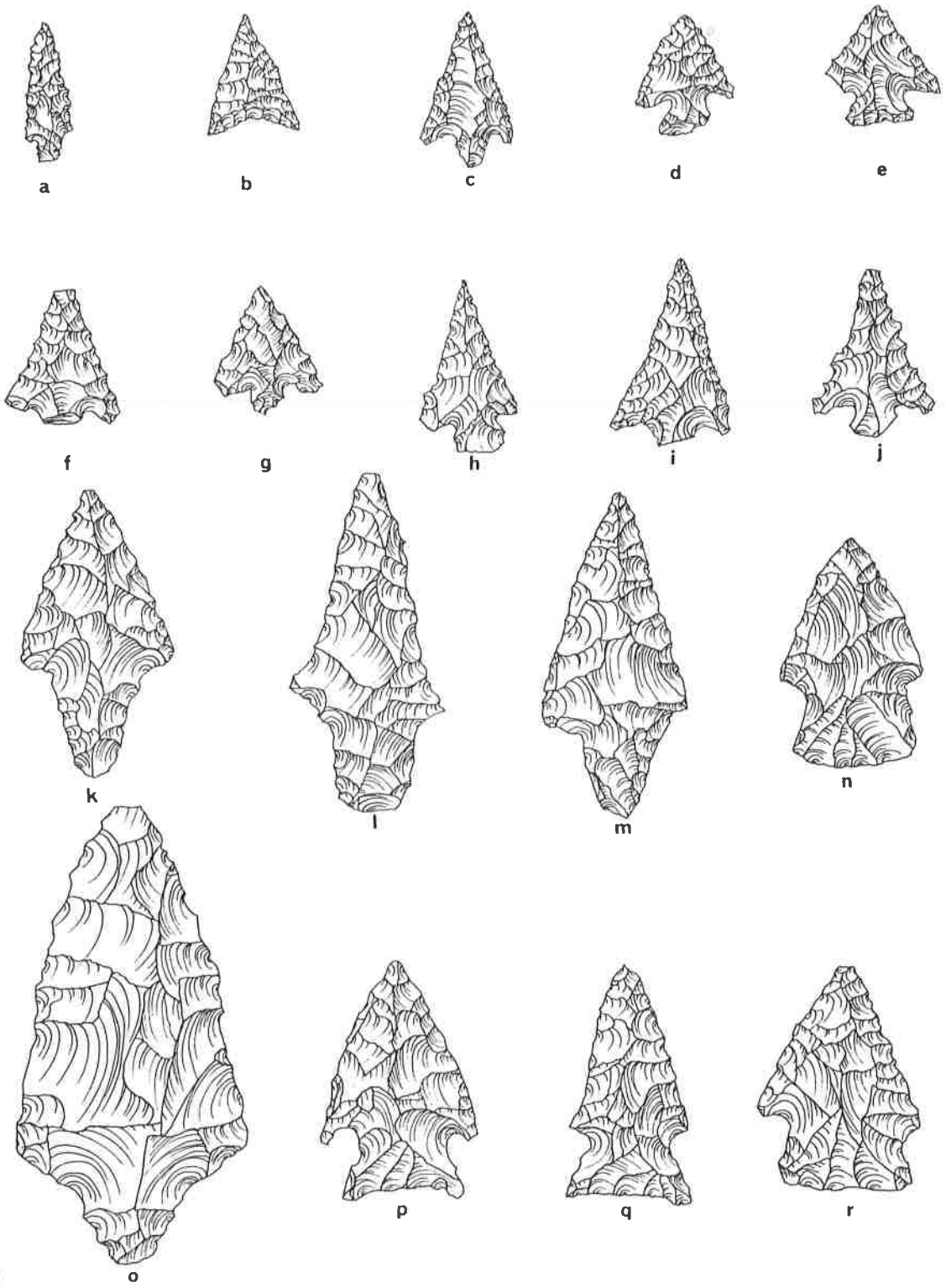

Figure 18. - Projectile Points from 41DL69. (Young Collection)

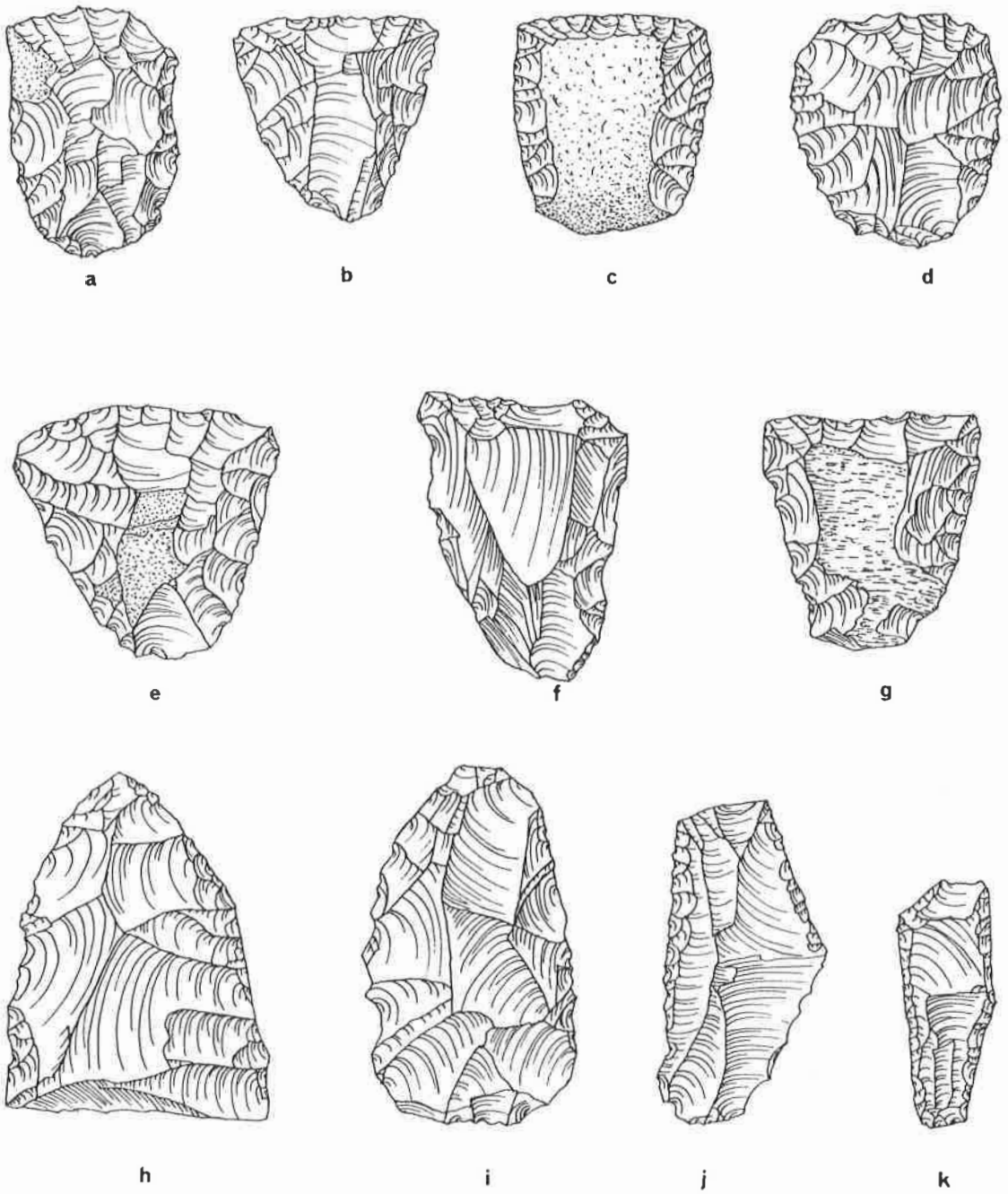

Figure 19. a-g Gouges, h-i Bifaces, j-k Retouched Pieces.

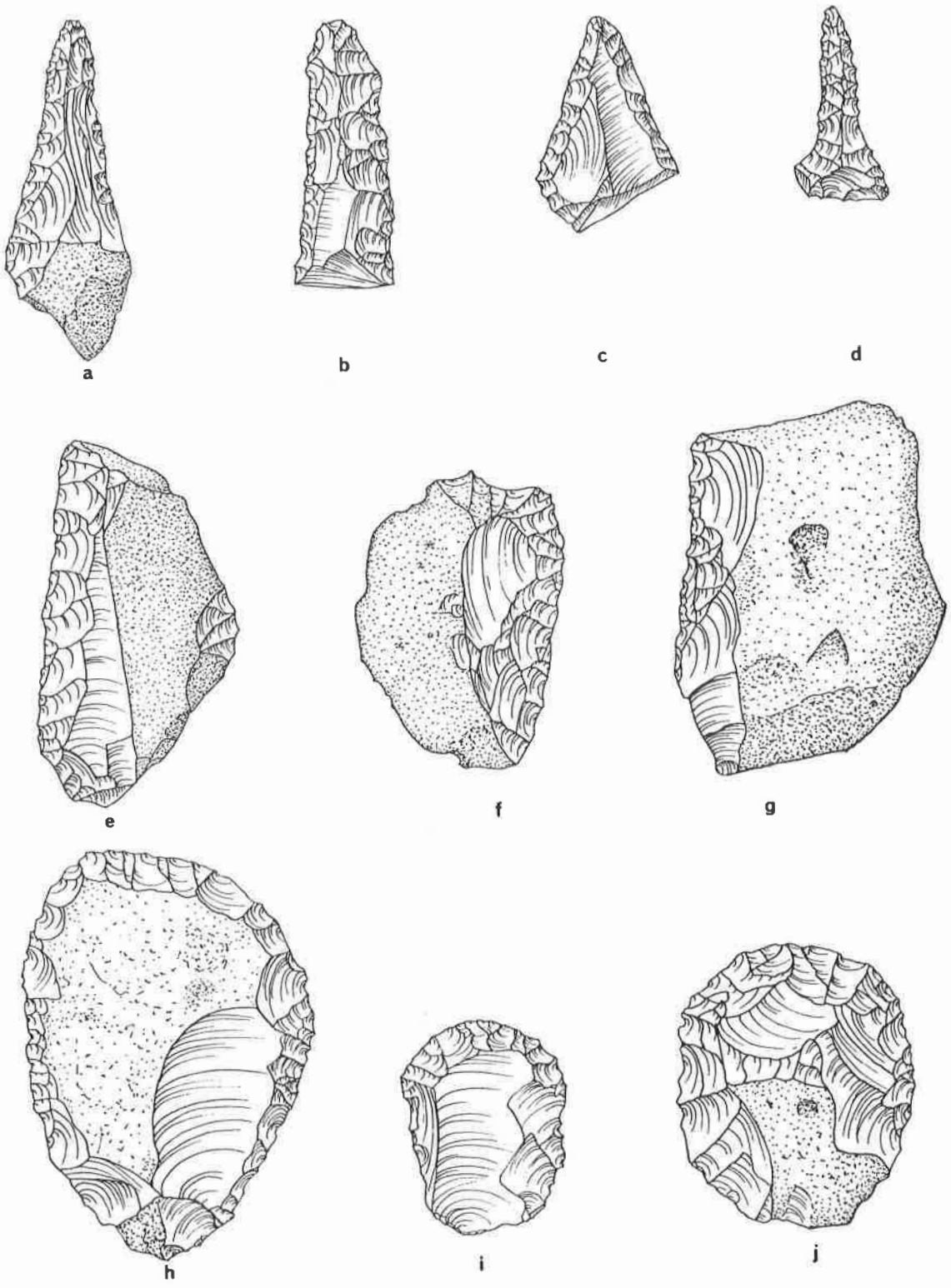

Figure 20. a - Borer, b-c Gravers, d - Drill, e-g Side Scrapers, h-j End Scrapers.

Table 1 Young Collection - Lithic Artifacts from 41DL69

Morphological Tool Type	Raw Material			Total #
	Petrified Wood	Quartzite	Chert	
Points				
Dart				
Contracting Stem	2	69	12	83
Straight Stem	0	20	15	35
Expanding Stem	0	44	53	97
Subtotal	2	133	80	215
Arrow				
Contracting Stem	0	0	3	3
Expanding Stem	0	8	5	13
Other	0	7	1	8
Subtotal	0	15	9	24
Bifaces	0	194	117	311
Gouges	0	29	1	30
Cores	2	10	8	20
Scrapers				
End	0	0	8	8
Side	0	0	8	8
Subtotal	0	0	16	16
Gravers	0	0	6	6
Miscellaneous				
Unifacial Tools	0	0	8	8
Retouched Pieces	0	17	109	126

upland situation. The site exhibited broken rocks and flint debitage. No age can be assigned to these sites due to a lack of datable complete artifacts.

The following table (Table 2) has been provided to serve as a general reference to all of the known archaeological sties within the city limits of Dallas. The information is only a portion of that which is on file at Southern Methodist University for each site, so as not to jeoparodize site integrity. Additional information following the State of Texas Uniform Site Form has been gathered and computerized, and is on file at the City of Dallas. This information includes precise locational data, the nature of the matrix, history of investigation, etc. for each site.

The informational breakdown in this table was made with regard to the type of data which city planners can use relative to their projects and includes size, temporal and locational placement, current condition and potential for further work. The presence of a question mark (?) in the Table indicates that the pertinent information is unknown.

Each site is listed by number, though it is obvious that the numbering systems differ to some degree. The trinomial system (e.g. 41DL69) is the numbering system used by the State of Texas and connotes those sites on file at the Texas Archeological Research Laboratory (TARL) in Austin. The other numbers (e.g. X41DL36 and NT3) indicate field numbers used by Southern Methodist University and North Texas State University, respectively. These sites have not as yet been recorded at TARL. One result of this study will be to coordinate and standardize site data for the City of Dallas and put it in the official state files.

Site Type

B Burial and/or Cemetery

K Bison Kill

SL Shell Lens

Q Chipped Stone Quarry

M Midden

LS Surface Scatter of Stone Artifacts

LC Lithic and Ceramic Scatter

CS Surface Scatter of Broken Pottery

I Isolated Piece

O Other

Soil Association

A Terrace

B Deep Clay Upland

C Clay over Shale/Chalk

D Silty Clay over Chalk

E Alluvial-Colluvial

F Silty Clay Floodplain

G Floodplain

Condition of Site

1 Undisturbed

2 Disturbed Natural Causes - Minor

3 Disturbed Natural Causes - Major

4 Altered - Construction

5 Altered - Agriculture

6 Altered - Quarrying

7 Inundated

8 Built Over

9 Totally Destroyed

10 Other

Prehistoric Stage

Stage was arrived at through examination of lithic and ceramics artifacts. Artifacts lists are with Site Forms and are not reproduced in the report except for 41DL69.

EP Early Paleo Indian

LP Late Paleo Indian

EA Early Archaic

UA Undetermined Archaic

LA Late Archaic

EN Early Neo-American

LN Late Neo-American

UN Undetermined Neo-American

U Undetermined

Topographic/Geomorphologic Placement (Figure 21)

LE Levee

CB Cut Bank

FP Floodplain

GB Gravel Bar

FR Floodplain Rise

PB Point Bar

OX Oxbow Lake

AC Abandoned Channel

TR Terrace

RT Remnant Terrace

UE Upland Edge

UP Upland

O Other

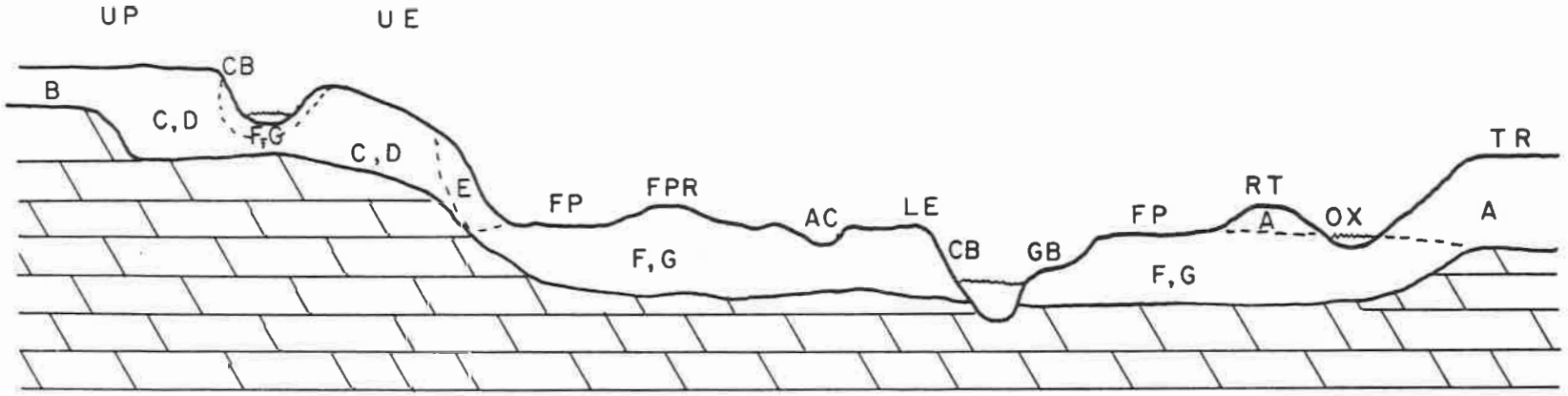

Figure 21. Relationship of Topography and Soils Shown in Table 2.

Potential for Future Work

1 None

2 Poor

3 Fair

4 Good

5 Excellent

6 Other

Site Number Prefix

41DL - The University of Texas Desig.

X41DL - SMU Field Designations

NT - N.T.S.U. Field Designations

Associated Drainage

TR Trinity

TRa Abandoned Channel

EF Elm Fork

PC Prairie Creek

WR White Rock Creek

SB Spring Branch

FM Five Mile Creek

FB Farmers Branch

JC Joes Creek

CC Coombs Creek

TC Turtle Creek

EC Elam Creek

DB Dixons Branch

AC Ash Creek

HG Honey Grove Spring

MC Mountain Creek

Table 2 Site Data Organized by U.S.G.S. Map

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				HUTCHINS QUAD MAP				
41DL72	LC	270 x 360	UN	A	WR	TR	6	3
41DL73	LS	180 x 270	UN	A	WR	TR	7	1
41DL74	LS	140 x 180	UN	A	TR & EC	TR	6	2
41DL75	LS	90 x 270	UN	A	EC	TR	8	2
41DL76	LS	360 x 740	UN	A	EC	TR	6	2
41DL77	LC	230 x 360	UN	A	EC	TR	6	2
41DL78	LC	140 x 140	UN	A	TR	TR	7	1
41DL79	LS	140 x 180	UN	A	TR	TR	7	1
41DL80	LC	140 x 320	EA-LN	A	FM	TR	4 & 6	5
41DL81	LS	140 x 460	UN	A	TR	TR	6	3
41DL82	LS	180 x 740	UN	A	TR & PC	TR	6	2
41DL84	LS	360 x 460	U	A	TR	TR	6	3
41DL86	LS	45 x 90	U	A	PC	TR		
41DL91	LC	90 x 90	UN	A	TR	TR	6	3
41DL92	LS	90 x 550	U	A	TR	TR	6	3
41DL97	LS	?	UA	A	WR	TR	2	4
41DL99	LS	?	U	A	TR	TR	4	2
41DL100	LS	?	U	A	Sb	TR	4	4
41DL102	LS	?	EA-NA	A	FM	TR	6	4
41DL103	LS	?	EA	A	TR	TR	6	4
41DL104	LS	?	UA	A	TR	TR	4	3
41DL105	LS	?	UA	A	TR	TR	9	3
41DL108	LS	90 x 140	UN	A	Sb	TR	4	2
41DL113	LS	?	U	A	PC	TR	4	2

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				HUTCHINS QUAD MAP				
41DL116	LS	180 x 270	EA	A	sb	TR	4	3
41DL121	LS	180 x 360	U	A	sb	TR	6	3
41DL122	LS	?	U	A	sb	TR	4	3
41DL123	LS	90 x 180	U	A	sb	TR	2	4
41DL130	LS	?	U	A	sb	TR	5	4
41DL131	LS	?	EA	A	sb	TR	6	3
41DL138	LC	?	EA - NA	TR	TR	6	2	
41DL139	LS	180 x 270	UN	A	TR	TR	6	3
41DL140	LS	?	UN	A	TR	TR	6	3
41DL145	LC	90 x 550	UN	A	TR	TR	6	3
41DL146	LS	140 x 140	U	A	TR	TR	6	3
X41DL36	LS	?	U	A	TRa	TR	9	1
X41DL37	LS	?	U	A	TRa	TR	9	1
X41DL38	LS	?	U	A	TRa	TR	9	1
X41DL39	LS	?	U	A	TRa	TR	5	3
X41DL40	LS	?	U	A	TRa	TR	5	3
X41DL41	LS	?	U	A	TRa	TR	9	1
X41DL42	LS	?	U	A	TRa	TR	6	3
				CARROLLTON QUAD MAP				
41DL14	LC	140 x 230	UN	A	FB	TR	4	3
41DL19	LC	154 x 270	U	G	TR	FP	2	4
41DL20	LS	90 x 185	U	G	TR	FP	9	1
41DL24	LS	90 x 180	U	G	FB	FP	3	3
41DL25	Q	23 x 45	U	A	JC	TR	5	3

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				CARROLLTON QUAD MAP				
41DL26	LS	30 x 40	UN	F	FB	FP	3	3
41DL35	B	?	UN	G	EF	FP	4	2
X41DL3	SL	?	U	F	EF	FP	4	4
X41DL4	SL	30 m. length	UA	F	EF	FP	4	4
X41DL5	SL	20 m. length	UA	F	EF	FP	4	4
X41DL6	SL	30 m. length	UA	F	EF	FP	4	4
				DALLAS QUAD MAP				
41DL21	LS	270 x 360	UN	A	EF	TR	4 & 8	2
41DL22	LS	140 x 270	UN	A	EF	TR	4 & 8	2
41DL23	LS	90 x 140	U	B	EF	UE	8	1
41DL52	LS	90 x 180	UN	A	EF	TR	9	1
41DL53	LS	180 x 270	U	A	EF	TR	9	1
41DL54	LS	90 x 180	UN	A	EF	TR	8	2
41DL55	LC	180 x 180	UN	A	EF	TR	4	2
41DL56	LS	140 x 180	UN	A	EF	TR	9	1
41DL57	LS	90 x 270	UN	A	EF	TR	4	2
41DL58	LS	140 x 140	U	E	CC	UE	9	1
41DL96	LS	?	U	A	TC	TR	4	2
				ADDISON QUAD MAP				
41DL41	K	?	U	F	WR	FP	9	1
41DL42	K	?	LN	F	WR	FP	2	4
41DL43	K	?	UN	F	WR	FP	4	3
41DL44	K	?	UN	A	WR	TR	2	4
41DL45	K	?	UN	F	WR	FP	4	3

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				WHITE ROCK LAKE QUAD MAP				
41DL36	LC	275 x 366	UN	C	WR	UE	9	1
41DL37	LC	45 x 55	UN	c	WR	UE	8	2
41DL38	Q	25 x 55	U	C	DB	UE	8	2
41DL39	LS	92 x 200	UN	c	WR	UE	9	1
41DL40	K	10 x 10	LNA	F	DB	FP	10	6
41DL65	LS	90 x 230	UN	A	WR	TR	9	1
41DL66	LC	140 x 360	UN	G	WR	FP	4	3
41DL83	M+B	96 x 120	UN	F	WR	FP	4,7 & 8	4
41DL85	LC	90 x 140	UN	F	WR	FP	4	3
41DL87	LS	?	U	F	WR	FP	4	3
41DL88	Q	15 x 56	U	D	WR	UE	8	1
41DL89	LS	38 x 50	U	D	WR	UE	4	3
41DL90	Q	80 x 95	U	D	WR	UE	8	2
41DL93	LS	45 x 90	UNA	C	WR	UE	8	1
41DL94	Q	90 x 230	U	D	AC	UE	4	3
41DL95	Q	115 x 320	U	B	sb	UE	4	1
41DL98	LC	?	UN	D	WR	UE	2	4
41DL101	LS	?	EA	D	sb	UE	2	4
41DL106	LC	70 x 155	UN	A	PC	TR	8	1
41DL126	LS	?	U	A	sb	TR	2	4
X41DL43	LS	?	U	D	sb	UE	4	2
X41DL44	LS	?	U	D	sb	UE	4	3
X41DL45	LS	?	U	D	sb	UE	4	3

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				WHITE ROCK QUAD MAP				
X41DL46	LS	?	U	D	sb	UE	2	3
X41DL47	LS	?	U	D	sb	UE	2	3
X41DL48	LS	?	U	D	sb	UE	2	3
X41DL49	LS	?	U	E	WR	UE	8	2
X41DL50	LS	?	U	D	sb	UE	2	4
X41DL51	LS	?					4	2
				GARLAND QUAD MAP				
X41DL52	LS	?	U	D	DB	UE	2	3
				IRVING QUAD MAP				
X41DL10	LS	?	U	A	EF	TR	4	3
41DL25	Q	23 x 45	U	A	JC	TR	2	4
41DL32	LS	?	EA	A	EF	TR	7	1
41DL59	LS	?	U	A	EF	TR	9	1
41DL64	LS	?	U	G	EF	FP	9	1
				OAK CLIFF QUAD MAP				
41DL67	LS	140 x 140	UN	A	TR	TR	9	1
41DL68	LS	460 x 460	UN	A	HG	TR	8	2
41DL69	LC	180 x 360	U	A	TR	TR	6	4
41DL70	LC	90 x 360	UN	A	TR	TR	6	4
41DL71	B	180 x 360	UN	A	TR	TR	4	2
NTSU 41DA3	LS	?	UA	F	FM	GB	3	1

Site Number	Site Type	Site Size Meters	Prehistoric Stages	Soil Association	Associated Drainage	Topographic/ Geomorphologic Placement	Condition of Site	Potential for Further Work
				OAK CLIFF QUAD MAP				
NTSU 41DA4	LS	?	U	A	FM	GB	3	1
				DUNCANVILLE QUAD MAP				
41DL61	LS	?	U	D	MC	UE	4	2
41DL62	LS	?	UN	A	MC	TR	7	1
				SEAGOVILLE QUAD MAP				
41DL151	LS	140 x 180	UA	A	HC	TR	8	1
41DL167	LS	140 x 140	EA	A	HC	TR	8	1
41DL175	Q	?	U	A	HC	TR	2	4

ZONES OF ARCHAEOLOGICAL PROBABILITY

Soil types and topographic placement of known sites were the major factors utilized in developing the archaeological probability zones. Soil types were deemed to be particularly sensitive in examining site distributions since they correlate, for the most part, with topographic variables that have been useful in defining archaeological site densities in other portions of the Trinity Basin (Richner and Lee 1977; Richner and Bagot 1978). Soils reflect the nature of climax plant communities in general terms, especially when combined with drainage factors. Evidence of man's use of the area is expected to occur in the soil mantle, and soil distributions have been plotted in detail for City planning options, thus soils provide a useful initial parameter for examining variability in site distribution. Topographic subdivisions of upland, transition and floodplain and various subdivisions within these major groups were also utilized in this regard. The 116 prehistoric sites within the Dallas City limits were recorded through examination of maps and site records from various souces including the Texas Archeological Research Laboratory, North Texas State University, Southern Methodist University, the Dallas Archeological Society, the Texas Highway Department, Housing and Urban Development housing project surveys, and information solicted from interested amateur and professional archaeologists. These sites were then plotted on 7 1/2' U.S.G.S. quadrangle maps showing soil distributions within the City provided by the City of Dallas. Then ratios of sites per square mile of soil types were calculated (Table 3). These ratios provided an initial indicator of site density, but it was felt that further refinement was needed to more effectively relate site distribution to topography. Data on site distribution in Dallas was used as the basis for this refinement although it was felt to be somewhat uneven since it was skewed toward artifact collector propensities, ground exposure and other factors including post occupation disturbance, siltation and various land use factors. Because of these factors a tentative model of site distribution is presented which does not claim statistical merit, but is testable and in our opinion offers the "best fit" explanation available.

The model presented here consists of 4 zones reflecting the probability of occurence of prehistoric sites across the City of Dallas. The probability zones are designed to be utilized with the methodology presented in section 5 to examine archaeological sensitivity within federally assisted construction projects to be undertaken hy the City of Dallas.

Other surveys (Richner and Lee 1977; Richner 1976; Skinner et.al. 1978) in the Blackland Prairie have shown that few sites are located on upland deposits away from water sources. When all sites recorded within the City limits on upland soils (B,C,D and E) were examined, it was noted that none occurred more than 250 m from a water source.

Table 3 Site Distribution

Soil Type	Square Miles Represented	# of Sites Recorded in These Soils	Ratio Sites/Sq. Mile
A (terrace soils)	47	72	1/.65
B (deep clay upland)	63	2	1/31.5
C (clay over chalk)	17	5	1/3.4
D (silty clay/chalk)	106	15	1/7
E (alluvial/colluvial)	23	2	1/11.5
F (floodplain - silty clay)	13	15	1/.87
G (floodplain - clay)	40	6	1/6.7

This strongly suggested that, in terms of archaeological sensitivity, upland soils should be separated on the basis of their proximity to water. This suggestion was further reinforced by environmental factors including animal and plant distributions which were closely related to topography and propinquity to water rather than soil type alone. For these reasons strips of upland soils B,C,D and E along waterways and relating to the transitional zones described in the second chapter were included in zones of higher sensitivity while upland soil areas away from water were placed in the lowest sensitivity zone.

Similar reasoning was utilized for the other soil types. Soil A (terrace soils) correlates precisely with the distribution of Pleistocene terraces which form extensive transition of zones beteeen wooded floodplains and grassy uplands. The terraces tend to be level, and form preferred areas for prehistoric occupation compared to the sloping transition zones formed by soils B,C,D and E. The very high site density recorded in Dallas in Soil A is also reflected at other areas in the Blackland Prairie (Richner and Lee 1977) and it was decided that this soil type should be separated from other soil groups due to the high site density and soil type A's unique topographic relationship.

Soil types F and G represent floodplain sediments and although F showed higher site densities, the two were grouped. This was justified, in part, due to the fact that higher site densities have been recorded in soil type G in other areas (Richner 1976; Richner and Bagot 1978). Furthermore this collapsing correlated more closely with the tripartate environmental division of floodplain, transition and upland presented in Section 2.

One further factor utilized in developing the sensitivity zones was drainage size. As shown in Table , most of the 116 sites in Dallas cluster along the larger drainages - Mountain Creek, Trinity River, Elm Fork of the Trinity, White Rock Creek and Five Mile Creek. Fewer, and smaller sized sites correlate with the smaller tributaries. For this reason drainage size was utilized as the final factor in developing archaeological sensitivity zones for Dallas. In summary, a threefold breakdown of soils based on site densities and relationship to topography combined with drainage size was the basis for developing archaeological sensitivity zones. Terrace soils (Soil type A) showed the highest site density and represented a useful topographic subdivision for analysis. Soil types B,C,D, and E supported relatively high site densities only along strips adjacent to waterways. Larger, more complex sites correlate with larger streams. Floodplain soils F and G supported relatively high site densities, particularly along larger drainages. Even higher site densities for soil type G is known for other Blackland Prairie areas. This division of soils and drainage led to the following sensitivity zones (Figures 22 and 23):

Zone 4 - Soil A - very high

Zone 3 - Soils B,C,D,E,F,G along large streams - high

Zone 2 - Soils B,C,D,E,F,G along small streams - moderate

Zone 1 - Soils B,C,D away from water sources - low

It was determined that urbanization and other site disturbance factors could be most effectively applied as criteria checklists for utilizing the sensitivity zones, since these disturbance factors are expected to change through time (Table 4).

The Probability Zones

Zone 1 - Low Probability

This zone includes all upland soil (B,C,D and E) areas except strips adjacent to waterways which were placed in Zones 2 and 3. Variability within this zone is not well documented, but from current evidence a limited array of prehistoric manifestations is expected. One loci would be gravel cobble fields (Menzer and Slaughter 1971) where lithic procurement sites occur. Archaic through Neo American utilization is expected. No other sites are documented in this zone in Dallas although it is expected that small, temporary hunting and food collecting sites occur but have a low visibility.

Zone 2 - Moderate Probability

This zone includes the stream channel and/or floodplain of all secondary drainages including spring fed branches and surrounding upland edge strips 250 m wide. A special case which includes more than 250 m of upland is shown in Figure 24.

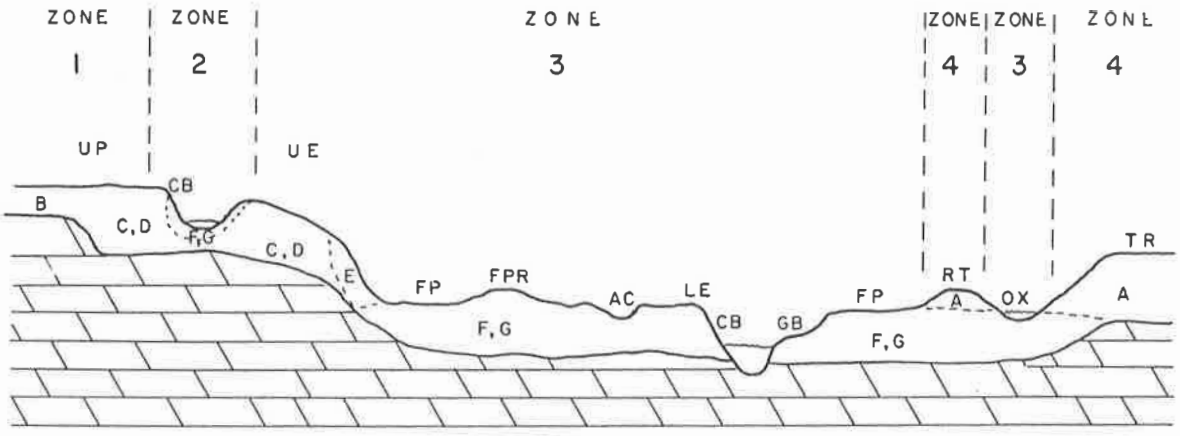

Figure 22. Cross Section Showing the Relationship Between Probability Zones.

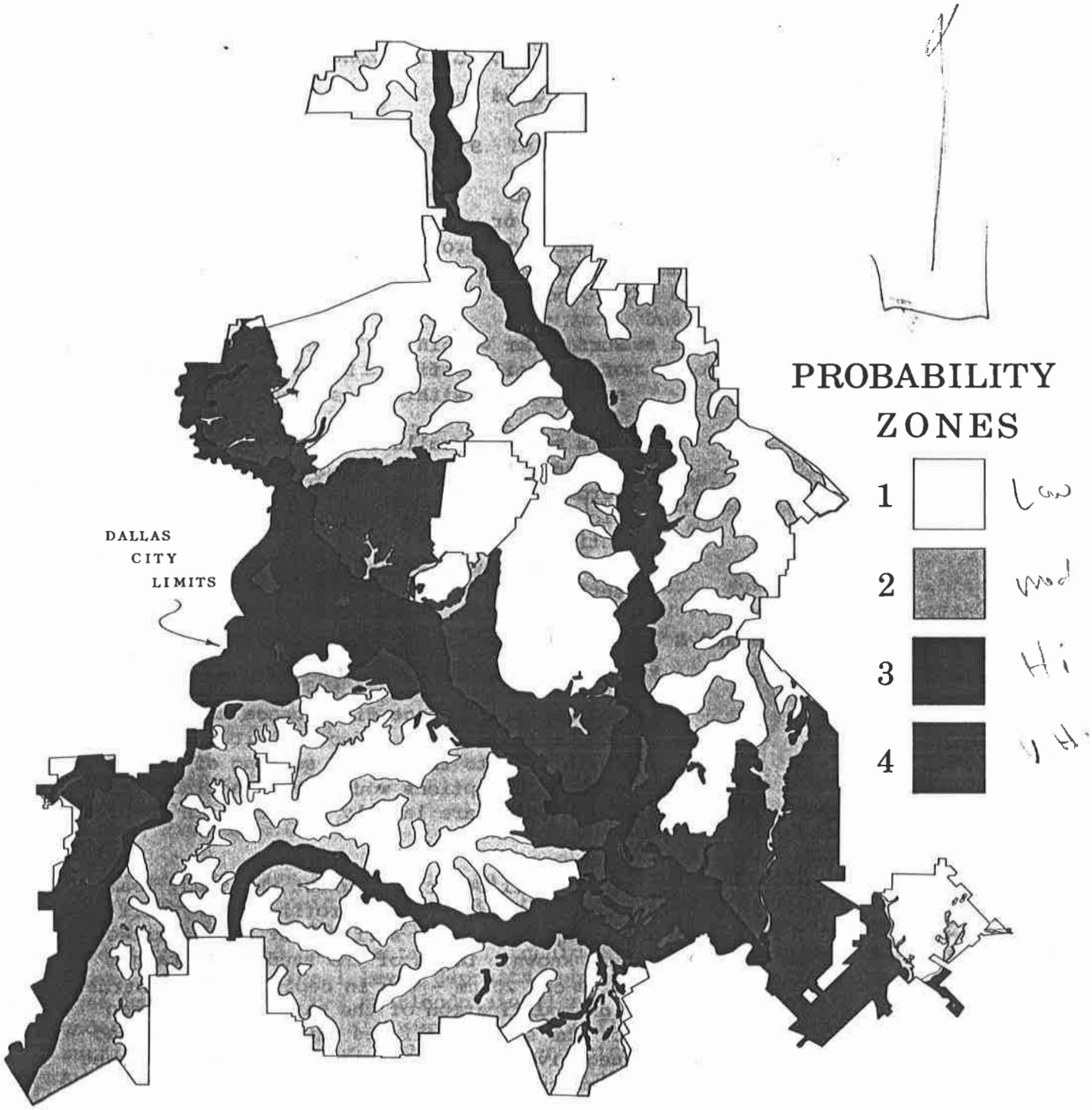

Figure 23. Archaeological Probability Zones in Dallas.

Table 4

Site Location in Regard to Probability Zones,
Topography and Land Use

Probability Zones	Site Placement
1 (Soils B,C,D)	Surface, or within the uppermost portion of the soil profile. Buried sites are not expected within this zone.
2 and 3 upland edge soils B,C,D	Surface or within the uppermost portion of the soil profile. Buried sites are not expected within this zone.
soil E	This alluvial/colluvial soil may support buried sites, although none have been recorded to date. All land surface modifications resulting from construction activities except filling procedures would adversely affect sites in these settings.
floodplain soils F and G	Sites can occur in buried settings throughout these soils. Sites can occur from the surface to the base of the Holocene clay sediments. Surface disturbance may have had little adverse effect on sites in these soils, due to the buried setting of the sites. Exceptions would be floodplain rise sites which are largely surficial in nature.
4 all terraces soil A	Sites will occur throughout the sandy loam component of the soil profile. Many will be exposed at the surface but buried sites are known. Depth of the sandy loam ranges from ca. 20 cm - 6 m in depth. All construction modification of the sandy loam horizon of the soil profile is expected to have had negative affects on sites. However, recent studies have shown that if any intact sandy loam soil areas remain, sites are likely to occur.

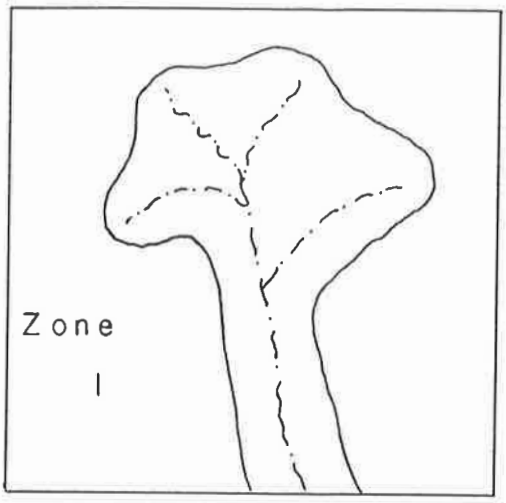

Figure 24. Headwaters in Zone 2.

In headwater settings narrow divides between branch streams have been included in Zone 2 even if the distance from water is slightly greater than 250 meters.

This zone includes more diverse kinds, numbers, and placement of sites than Zone 1. Bison kill sites are known buried in floodplain sediments and exposed by channel erosion. Various ceramic and/or lithic scatters are found on the upland edge setting within this zone. Due to the nature of the soils, these sites occur exposed on or buried just below the surface.

Zone 3 - High Probability

This zone encompassed floodplains of large drainages, stream channels, and a 250 m wide strip of the upland parallel to the drainages. The large streams included in this zone are:

1.) Trinity River

2.) Elm Fork of the Trinity River

3.) West Fork of the Trinity River

4.) Mountain Creek

5.) White Rock Creek

6.) Five Mile Creek

All other waterways are included in Zone 2. Several site types located on various topographic features have been recorded in this zone. Paleo Indian, Archaic and Neo American lithic and/or ceramic scatters are recorded from upland edge settings. Archaic and Neo American scatters are known buried in natural levee deposits, while artifact scatters of all ages have been recorded on floodplain rises. The levee sites may be sealed under small amounts of alluvium, while the floodplain rise sites are largely surficial manifestations. Shell lens and bison kill sites spanning middle Archaic through Neo American stages are located buried in floodplain sediments are exposed in stream cutbanks.

Zone 4 - Very High Probability

This zone correlated with Pleistocene terraces demarcated by the distribution of soil type A. Some variability in site density is included within the zone. Highest site density and sensitivity is found on the first and second Pleistocene terraces present at floodplain margins or occasionally as remnant "islands" in the floodplain. These relatively level deposits exhibit deep soil/stratigraphic profiles. The lowest unit is ordinarily gravel and coarse sand, overlain by red clay and capped by sandy loam. Archaeological materials are expected to occur only in the uppermost portion - the sandy loam horizon, although occasionally artifacts have filtered down into the uppermost portion of the clay. No in situ cultural remains are expected to occur in the clay or gravel horizons. The sandy loam layer varies in depth from ca. 20cm to over 6 m, and cultural remains can occur within all or any portion of this zone. Sites are usually exposed on the surface of the first and second terraces, although occasionally buried deposits lacking surface indications have been recorded. The surfaces of the first and second terraces are from 6 m to approximately 15 m above the floodplain.

Other terraces (T_3 - T_5) above this elevation are also included in Zone 4 although site densities on these deposits are less than for the first and second terraces.

Sites cluster primarily along the floodplain edge of the terraces, although sites have also been recorded well back onto the central portions of the deposits. Artifact scatters and midden sites of all prehistoric ages are recorded in Zone 4. Some of the sites are quite large (30,000 sq. m) although smaller sites are also recorded. Many sites in these areas have been disturbed or destroyed by gravel and sand quarrying operations.

Based on the criteria presented above, probability zones were developed for the entire City of Dallas. This was accomplished by developing the zones on mylar overlay maps for each 7.5' U.S.G.S. quadrangle map which includes portions of the city. These overlay maps, as well as U.S.G.S. quadrangle maps plotted with all known sites, are on file at the Department of Urban Planning as well as in files of the Anthropology Department at Southern Methodist University. In addition, the sites have been plotted on blue line copies of aerial photographs of the city provided by the Department of Urban Planning. These maps are also on file at Southern Methodist University. A reduced copy of the White Rock Lake 7.5' U.S.G.S. quadrangle map mylar overlay is shown on Figure 25.

Figure 25 Mylar overlay for White Rock Lake 7.5' U.S.G.S. map

IMPLEMENTATION

The following section presents a comprehensive three step survey and evaluation procedure which utilizes current understanding of archaeology within the 4 probability zones. The procedure provides a logical step by step format which allows appropriate questions to be addressed for survey and site examination within a particular zone. The overall format is designed to meet the needs of the City of Dallas and is modeled upon a form referred herein as the NEPA format and as discussed in the Airlie Guidelines on the Management of Archeological Resources prepared by the Society for American Archaeology (See Appendix I). The procedure presented here is designed for a specific geographic area (Dallas, Texas) and for small-scale community projects. At a more general level it has broader implication for the successful management of archaeological resources in a variety of projects in Northcentral Texas and elsewhere.

The goal of the methodology presented is to satisfy the intent of the National Environmental Policy Act of 1969, as well as other federal, state, and local laws, regulations and directives. The procedure is designed to insure that archaeological sites, if present, are located and evaluated at the earliest possible time and then can become a part of the necessary process of mitigating the loss of natural and cultural resources. The procedure is also geared towards efficient, on-the-ground, study of proposed project areas without becoming "locked-in" to strict site survey methodologies that may not apply in specific instances, such as in grossly disturbed areas.
The three step procedure consists of:

Step 1 - Homework Phase
Step 2 - Field Investigation
Step 3 - Extensive Site Testing

As outlined below archaeological clearance may be provided at the completion of the first or second step. If Step 3 is conducted it is logical to expect that site mitigation (avoidance, preservation or excavation) will be necessary and this will need to be considered in the construction and funding schedule of each project.

Before describing the procedure, it is incumbent upon all persons concerned with project planning to recognize that this three step format was designed to insure careful consideration of archaeological resources in planning but is not a universal procedure to be blindly applied to all types of projects. If the City staff or others concerned with reviewing a proposed project recognize that land modification will not occur during or as the result of the project then the Texas Historical Commission should be so advised. Such a justification is in the best interest of the City, the State and the responsible management of archaeological resources. If land modification is to occur then it is necessary to proceed to Step 1. In the interest of long range planning we recommend that the procedure outlined below be followed when new land that has not previously been substantially altered is acquired by the City. This however is not

required but an inventory of archaeological sites would be required of a land tract purchased with federal funds and then traded or exchanged for other land.

Step 1 - Homework Phase

The Homework Phase includes the preparation of a local archaeological overview, a records check, a review of past land use activities and a determination of associated archaeological probability zone.

An overview of the local archaeology is provided in this document and, as such, it, along with earlier records and reports, provides the framework for evaluating archaeological sites within the City of Dallas.

Site records (descriptions) are on file at Southern Methodist University, at the Texas Archeological Research Laboratory (located at the University of Texas in Austin), with local amateur archaeologists and the Dallas Archeological Society. Historical records are available through the Texas Historical Commission, the Dallas Historical Society and area libraries. These sources should be investigated at this time. This can be done by the staff of the Department of Urban Planning. These files are regularly updated and involved staff should check these at the start of each new project review. The National Register of Historic Places should be consulted and the State Historic Preservation Officer (SHPO) should be contacted to determine if any known sites in the proposed project area are being considered for nomination to the National or State Registers.

At the completion of the records check it will be possible to evaluate if the proposed project is likely to have an adverse impact on any known archaeological resources. Such a records check does not satisfy the requirements of state and federal agencies since it does not constitute an on-the-ground investigation. It does alert all concerned parties to the presence of resources and emphasizes the need for further investigation of the proposed project area. It should be reemphasized that an absence of recorded archaeological sites is more likely an indication that the area has not been investigated rather than that archaeological resources are absent. Therefore, negative findings do not indicate that further work is unnecessary.

Past land use should always be determined before archaeologcial field investigations (Step 2) are conducted. Field checks by city staff can be supplemented with review of maps and aerial photographs as well as interview information from previous land owners and users. Not only will this serve as an independent check against applicability of the probability zones presented above, it also provides an opportunity to question the interviewee about the presence of prehistoric or historic artifacts in the project area.

Recent terrain or land modification has had a significant impact upon archaeological remains in many areas. While geologically many sites have

been buried and others have been exposed by erosion, most recent land use practices have a detrimental impact upon preserved archaeological sites. We have chosen the terms "major modification" and "minor modification" as a means of subdividing the probability zones. We also assume that disturbance of soils and cultural deposits is significantly more injurious in areas to receive major modification. By major modification we mean:

- sand/gravel and other quarrying activities
- land leveling (cut and fill operations)
- terracing fields for water retention
- creek and river channelization
- clearing large land tracts through bulldozing or other grading techniques

By minor modification we mean:

- plowing and other forms of cultivation
- pasturing
- some construction activities, i.e., single dwelling, pipelines
- small scale land clearing
- natural erosion of native areas

This dichotomy recognizes a relative difference in the types of sediments, depth and nature of surface disturbance, and in the amount and area of erosion that may occur after the ground cover has been removed (Ford, Rolingson and Medford 1972).

During inspection of the project area by City Staff members particular attention should be given to the current ground cover (vegetation) and to the amount and location of exposed surface area present. This information needs to be available to determine the intensity and duration of Step 2 field studies or to recommend monitoring. Small soil units, distinctive topographic features and water resources (unmapped springs, seeps, etc.) should also be evaluated for the likelihood of restricted locations for preferred aboriginal occupation not reflected on the probability maps.

Very few archaeological sites have been located in Zone 1. Because of this low density we do not recommend an archaeological survey of proposed projects located in this zone that have received major modification or are less than 50 acres in area unless archaeological sites have already been reported.

At the conclusion of the Homework Phase (Figure 26) it will be possible to predict the likelihood of archaeological sites being present. Taking this into account along with knowledge of projected land modification and current vegetation cover, the City staff should then decide if they should proceed to Step 2 or recommend "on call" monitoring of the project during construction. It is our recommendation that in the case of small-scale projects such as landscaping and irrigation, light pole placement, and other minor construction activities as well as project areas that have previously been landscaped or otherwise offer no subsurface exposure, a professional archaeologist should be available to respond to a call from

the City to conduct an immediate spot check of possible archaeological finds uncovered at a specific project. Such obvious finds include burials, mussel shell lenses, charcoal, flint tools and other artifacts are likely to be recognized by construction personnel, City staff or other interested individuals who are present at the construction site and who are advised of the City's concern for archaeology. In order to increase awareness it may be necessary to provide a training program for regularly involved staff members.

We do not believe it is necessary or cost effective to have an archaeologist inspect each of these locations during construction unless a specific reason, such as the likelihood of buried sites, is generated before construction begins. "On call" monitoring is likely to result in the recording of previously unreported archaeological sites which should be reported to the Texas Historical Commission. It is unlikely to delay projects because whatever land modification to occur will have been completed before the monitoring can be done. Thereafter it will be the City's responsibility to use the information in planning future development in a specific site area.

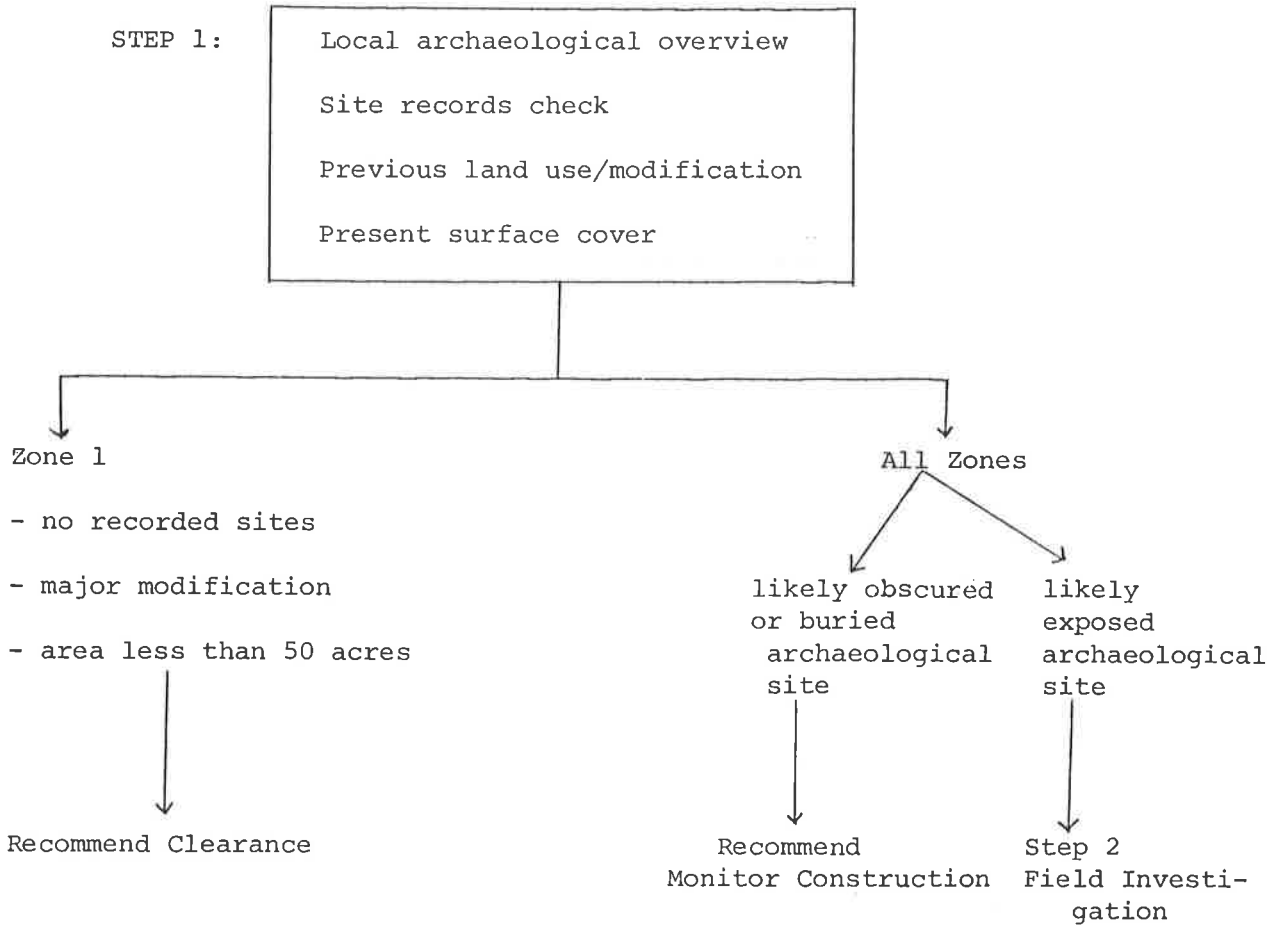

Figure 26. Summary of Step 1 procedure and results.

Before proceeding to decide what should be done to satisfy Step 2 it is important to be able to answer the following questions:

- Are archaeological sites reported in the project area?
- How large is the project area?
- How has the terrain been used in the past?
- What is the nature of current ground cover?

With the above information gathered, Step 2 should be started, 1) if justification for terminating the study has not been made on the basis of past land modification or 2) if monitoring has not been recommended as the most effective way to evaluate potential resources in a particular project area. If the study is to be terminated the City should prepare a negative declaration of archaeological impact stating the reasons for termination. This should be submitted to the Texas Historical Commission for review and comment.

Step 2 - Field Investigations

Once the Homework Phase has been completed it may be necessary to conduct an on-the-ground field investigation referred to here as a Reconnaissance Survey or as an Intensive Survey. The reconnaissance is a walkover survey which is to be implemented primarily in areas which have received major land alteration and areas where ground cover obscures the surface. The intensive survey is a systematic foot survey of the entire project area which insures that all areas have been carefully inspected. For a more thorough discussion of archaeological surveys, the reader should refer to "The Archeological Survey: Methods and Uses" by Thomas F. King and available from the Heritage Conservation and Recreation Service of the Department of the Interior (King 1978). In some cases the reconnaissance and the intensive survey will need to be done on different portions of a single project. The goal of the surveys should be to relocate and reevaluate the condition of reported archaeological sites and to locate previously unreported artifacts and other evidence of prehistoric human occupation, if present. Buried sites may be exposed on the surface as the result of animal burrowing, deep chisel plowing or post hole excavation. On the other hand buried sites may be expected if past experience has shown sites along the banks of old river channel levees or in floodplains adjacent to rivers and creeks. In some cases where buried sites are suspected, subsurface probes with shovels, soil augers or post-hole diggers may be used to determine if archaeological sites are really present. At the completion of Step 2 it should be possible to state whether or not archaeological sites are present and if so whether they should be nominated to the National Register of Historic Places. It will also be determined if monitoring during construction is needed.

A nondestructive survey is preferable to a survey in which artifacts are not removed from their primary context. Artifacts can be left in place after being drawn in notes and photographed and this allows later investigators to be able to relocate sites at which only a few artifacts are exposed. Site photographs, sketches and detailed survey forms need to be completed

for each site. Copies of these should be placed on file at permanent depositories such as the Texas Archeological Research Laboratory and the Anthropology Department, Southern Methodist University.

It is important that field studies are conducted by trained individuals to insure that appropriate state and federal officials are able to rely upon the results. We recommend that an individual who meets the guidelines for an Archaeologist as formulated by the Texas Antiquities Committee (Appendix III) be chosen to conduct field investigations. We also urge that the archaeologist consult with local artifact collectors and amateur archaeologists about unreported archaeological sites and consult available regional settlement models listed in the bibliography (Skinner 1972; Smith 1969; Lynott 1977).

During Step 2 previously recorded archaeological sites should be revised. Many of these previously sites have not been monitored since they were recorded. It is necessary to update site records in order to make them an useful management tool that is responsive to changes in archaeological method and theory.

We estimate that an archaeologist can on the average do a reconnaissance survey of a contiguous one hundred acre block in a single day and can walk ten miles of a linear corridor right to way in the same amount of time. On an average, 50 acres or 5 miles of linear corridor can be intensively surveyed in a day. This time estimate includes travel time within Dallas County, but time for limited subsurface testing and report preparation, including National Register forms, will vary depending upon the results of the field study. Some studies may take additional time depending upon the abundance of archaeological sites and the relative proportion of probability zones in the project area.

The City or a consulting archaeologist may have to secure an Antiquities Permit from the Texas Antiquities Committee in order to conduct an archaeological site survey. A permit is necessary if a survey is being conducted on publicly owned land and if the survey is to be paid from City funds including revenue sharing monies. Permits are not needed if studies are being done on privately held property or if the planned project is supported by federal funds.

The following discussion describes the Step 2 procedures to be used in the probability zones 1 to 4.

Zone 1

Archaeological sites are uncommon in this zone and therefore we have recommended (Figure 26) that no field investigation be carried out if the area has received major terrain modification, or is an area with minor modification but is less than 50 acres. We deem it inappropriate to survey less than 50 acres because of the low site density and the low cost effectiveness of hiring an archaeologist for such a small area. However, if the tract of land, regardless of size, includes recorded

sites, we recommend a reconnaissance survey (Figure 27).

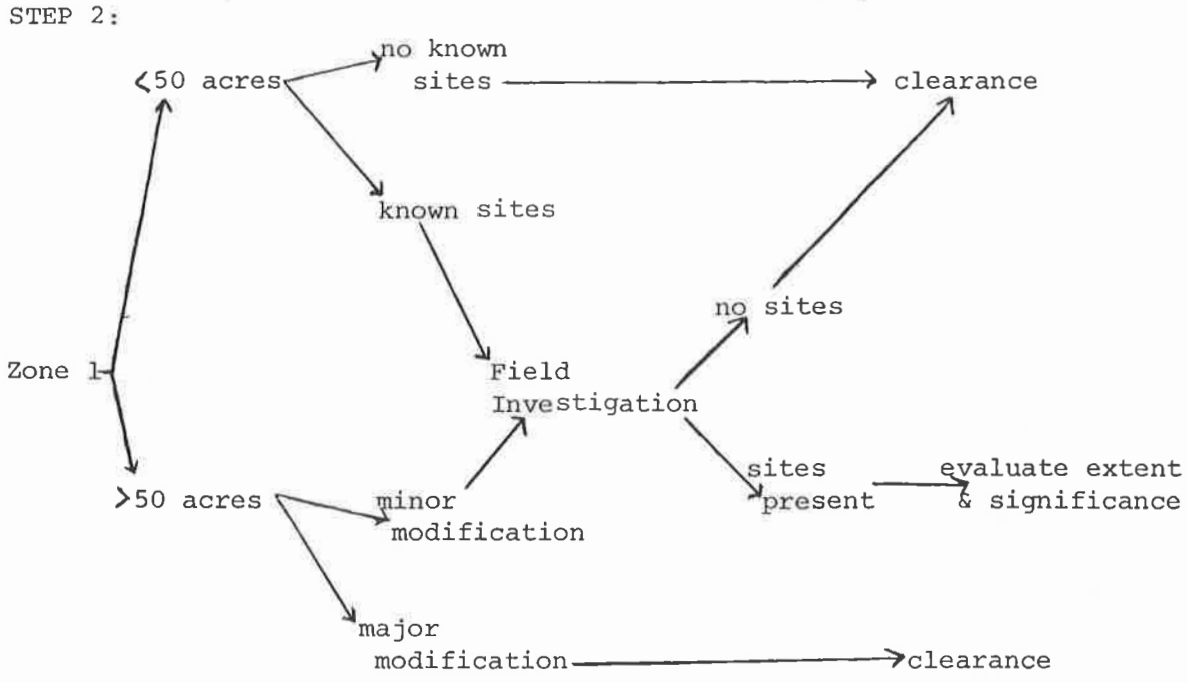

Figure 27. Step 2 procedure in Zone 1.

Zones 2 & 3

Archaeological sites in these zones frequently occur at the edge of the upland, or on rises in the floodplain, and exposed in drainage banks. We recommend a reconnaissance survey (Figure 28) of areas which have received major land alteration and also of areas which have received minor modification but have a thick vegetation cover (grass, trees, weeds, etc.) where the ground surface can not be clearly seen. In areas of minor modification where the ground surface is exposed an intensive, systematic survey needs to be done and should insure thorough coverage of the project area. Drainage and prior excavation walls (creek and river banks, gullies, channels, gravel pit walls, building foundations) must be carefully checked for buried deposits, and when possible deposits are located, walls should be vertically faced to expose the extent and depth of the cultural zone or zones and the subsequent sedimentation. If buried deposits are located then it will be necessary to proceed to Step 3 but only after hand tool testing has shown that this step is warranted.

STEP 2:

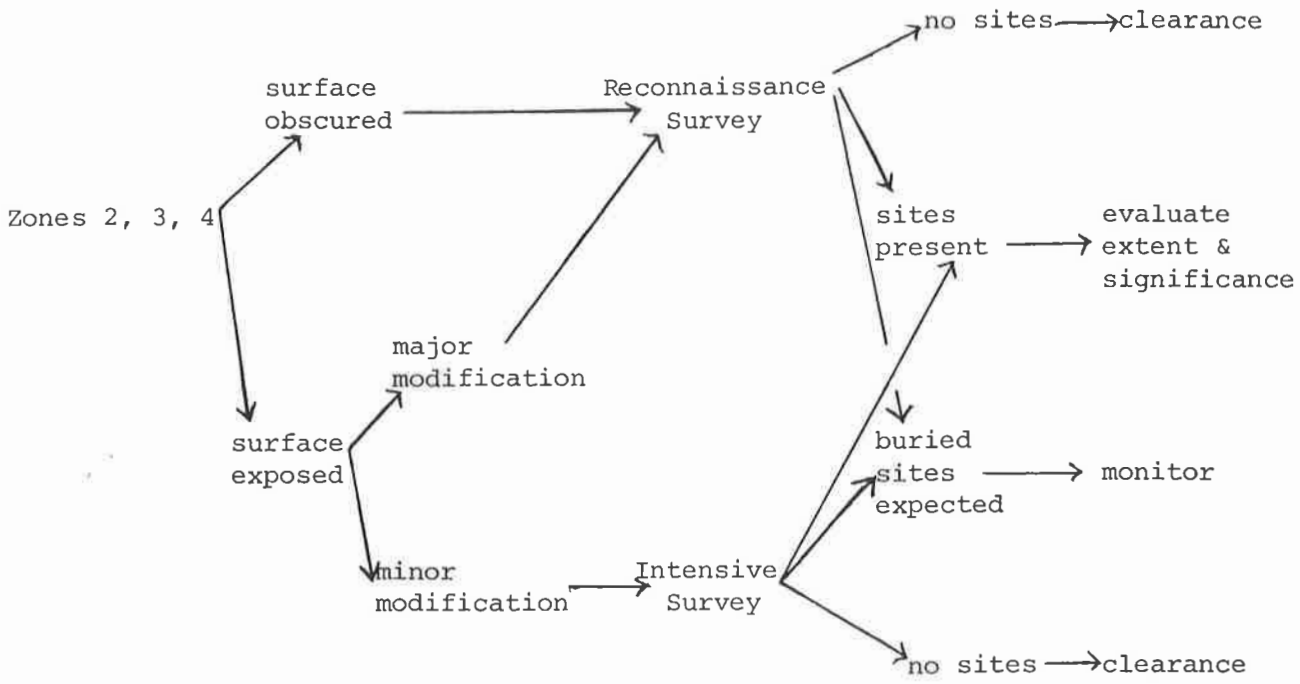

Figure 28. Step 2 procedure in Zones 2, 3, and 4.

Zone 4

Terrace sites tend to be extensive in area and contain a wide variety of artifacts and frequently were preferred locations for occupation. Previous surveys have located numerous sites in this zone and intensive survey is recommended in areas with minor modification. Reconnaissance survey should be conducted in areas of major modification and areas of dense surface vegetation but minor modification. See previous comments regarding careful inspection of drainage and excavation walls; if buried deposits are discovered it will be necessary to move to Step 3.

If archaeological sites are not discovered during Step 2 then the City should forward the consulting archaeologist's report to the Texas Historical Commission with the request that they provide archaeological clearance. The Commission can provide clearance under the authority of Section 106 of the National Historic Preservation Act of 1966. The report should explain why the survey was done and make recommendations for clearance. It should also specify the type of survey conducted by the archaeologist, the areas covered by the survey and ground cover conditions. Other relevant information such as that provided by amateur

archaeologists should be included in the report (Way 1978).

It should be emphasized here that after a site is located during Step 2, limited site testing with hand tools as outlined above can be conducted to aid in site evaluation. In the case where deeply buried occupation layers or extensive but buried deposits are found during the survey, it is necessary to move to Step 3 because the Texas SHPO generally requires information about subsurface deposits before determining National Register eligibility for archaeological sites.

"On site" monitoring is recommended for relatively extensive land modification projects (e.g. major water or sewer line construction, channelization, floodplain cut and fill projects, levee construction and others) in heavily vegetated or silted areas. This monitoring is designed to augment reconnaissance and/or intensive surveys, particularly within soil groups F and G in floodplain areas where buried sites are known to occur. There is a burgeoning recognition in Texas for the need and utility of monitoring during project construction (Briggs, personal communication). Where "on site" monitoring is to be carried out, an archaeologist should be present during select intervals while land modification is undertaken, the timing of involvement to be determined on an individual project basis. The decision to choose monitoring should be seriously weighed because of the potential for construction delay if significant archaeological resources are not located until excavation has been started. Monitoring will be cost effective and practical resource management, but occasionally buried archaeological sites will be located when the overburden is removed. Therefore the decision to monitor should consider the likelihood of finding archaeological sites, the nature of excavation, and the construction schedule.

Step 3 - Extensive Site Testing (Figure 29).

This step should be used when it is necessary to determine the depth or extent of a buried archaeological site. The goal of this step is evaluation for site importance and potential for future work or for preservation. Testing should be conducted with mechanical equipment arranged by the City of Dallas. We recommend the use of backhoes or other earthmoving equipment to ascertain depth and extent of buried archaeological sites and the use of plowing or other shallow inplace land clearing techniques to rapidly and efficiently determine the horizontal extent of sites which are covered with grass, weeds or other surface deceiving vegetation. Testing requirements are site specific and estimates should be developed on a site by site basis. In most cases, several days should be sufficient to determine site extent. Certainly at the conclusion of this step, a site should be adequately evaluated and its eligibility for inclusion in National Register determined.

STEP 3:

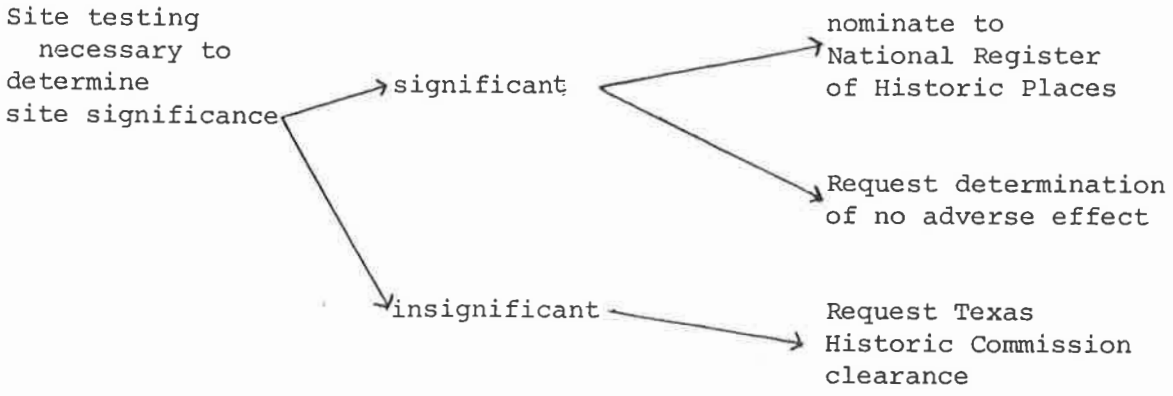

Figure 29. Step 3 procedures.

A report describing the archaeological findings of the project area must be submitted to the City for review. In addition to the information outlined above, this report should describe the archaeology, evaluate it and make recommendations for clearance or further studies depending upon the nature of the archaeology.

If archaeological sites are located they should be evaluated by the consulting archaeologist with regard to National Register eligibility criteria and then submitted by the City to the State Historical Preservation Officer (SHPO) for nomination. If the consulting archaeologist does not believe that the sites are eligible for inclusion on the National Register, a recommendation for clearance should be prepared along with a clear explanation of why the recorded sites have not been nominated. Sites should have the following information about them available:

- description of deposit composition and appearance
- horizontal and vertical extent of deposit
- state of preservation of deposit
- age(s) of occupation
- functional interpretation of site
- potential eligibility for the National Register

This information along with photographs of the site must be submitted to the State Historic Preservation Officer for the nominated sites. If the SHPO does not deem a site eligible then he will provide clearance and then the City can disregard the site in its planning and construction process.

Placing an archaeological site on the National Register of Historic Places is a means of formally recognizing the local, state, regional or national importance of a particular site. The Register is considered to be a planning tool designed to recognize importance and to aid in the protection and preservation of these nonrenewable resources. Excavation of archaeological sites is a responsible means of mitigating the loss of the information contained within a site only if other forms of mitigation are impossible or impractical. Preservation of deposits in place is preferable to excavation and helps to insure that future generations will continue to be able to advance their understanding of past societies because the people of today cared enough to preserve the evidence of the past for the future (Lipe 1974; Jennings 1973; Clark 1957). Preservation may be accomplished by avoidance of known archaeological sites, by covering sites with earth or by modification of project design to leave sites undisturbed.

If a site is determined eligible by the SHPO and the Advisory Council then the City needs to advise the Interagency Archeological Services (IAS) Branch of the Heritage Conservation and Recreation Service (HCRS), Department of Interior about the potential for site disturbance. IAS can provide suggestions regarding conservation, preservation, and mitigation plans and is also the avenue for securing federal funds to excavate a site if preservation is not practical. On the other hand, if time is short, the Texas Historical Commission may be able to provide matching funds to preserve or excavate an endangered site as well as local expertise regarding site stabilization.

An alternative to the determination of eligibility to the National Register is applicable when archaeological sites are primarily significant for the data they contain but has minimal value as an inplace exhibit for public understanding and enjoyment. The procedure is for the City to request that the State make a determination of "No Adverse Effect". A no adverse effect determination requires that the City and State agree that an archaeological property will realize its significance when the contained data are retrieved in an appropriate manner and that the funds and time have been committed to such a recovery procedure. A statement to this effect is forwarded to the Advisory Council on Historic Preservation for their concensus. This procedure is generally quicker than the National Register procedure but places full financial responsibility for recovery upon the City of Dallas.

Recommendations

It must be reiterated that the probability zones presented above constitute an archaeological site density model, not a settlement model, which can and should be tested by future researchers. It can be used to point out questions which are recognized as important to Dallas archaeology and can be used to provide researchers with a foundation to which new methods and theories can be added.

We recommend that archaeological studies be regularly included as part of

future studies of watersheds, parks, land acquisitions and other projects of the City of Dallas. Such studies should be conducted in accordance with the methodology outlined above. Although significant information has been lost in the past, this study has shown that important sites are still present and that further information is needed to explain the history and way of life of the prehistoric inhabitants of Dallas. Because many known sites have been lost in the past thirty years, the remaining sites gain increased importance because they are all that remains of the prehistoric life ways. In particular, certain areas including the junction of the Elm Fork of the Trinity with the West Fork, the valley of White Rock Creek and other creeks form unique areas which remain to be fully evaluated.

Once important sites are known it then becomes possible to manage them effectively. Where feasible, sites should be acquired and included in parks, greenbelts, and floodways where they can be preserved by a grass mat and protected from needless disturbance. Grass can protect sites from erosion and also from artifact collectors who merely want to pick up artifacts without concern for the irreplacable historical information that is thus lost. Many of the sites already recorded within the city limits may be eligible for inclusion of the National Register and should be so recognized by the City. In the future these sites can be developed, excavated, stabilized and made available for the appreciation of future generations.

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APPENDIX I

NEPA PROCESS CHECKLIST (for EISs)

Overview and Assessment I

This stage combines both a general and a project specific evaluation of the resources to be impacted by a proposed project. Overview and Assessment should provide planners with a tentative predictive model as to the probable nature and disposition of the resources in the area.

Requirements - Contact SHPO, Texas Historical Commission for Guidance

1. literature search (published and archival)

2. check National Register, Texas Antiquities and Landmarks, Dallas landmarks

3. check Highway Department records of sites, TARL, AM bldg. Survey, Historic AM Eng. Record

4. talk to collectors and specialists

5. evaluation of records, literature, and discussions with specialists

6. identification of inadequacies in knowledge

7. sample survey of site prediction based on demographic, environmental or other models.

8. preliminary research designs and costs proposed for reconnaissance

Preliminary Reconnaissance II

Preliminary Reconnaissance often follows Overview and Assessment, but this stage may also be undertaken at the preliminary planning stage. Preliminary Reconnaissance expands upon Overview and Assessment and at the same time narrows its scope by concentrating upon one area(s) specifically and assessing potential impacts and the significance of the cultural resources in the impact areas. If project planning is limited by time, this stage can be combined with intensive Field Examination.

Requirements

1. all of Overview and Assessment

2. sampling survey conducted within portions of alternative project locations - 2 stage survey: 1. determine nature/density and 2. sub-

surface testing significance

3. assessment of predicted effects upon the resource base of each project

4. predictive model of site density and location

5. assessment of deficiencies in knowledge

6. projected methodology for intensive survey

7. EIS may be prepared at this stage if reconnaissance and background research indicate that no cultural resources occur in the area or will not be either indirectly or directly impacted by the proposed project

8. obtain necessary permits (for modification of sites on or eligible for Federal, State and local Registers)

Intensive Field Study III

The Intensive Field Study is dependent upon all previous information (I and II). This information must be summarized and updated for incorporation in this report. The aim of this study is to develop an inventory of the cultural resources in the proposed project areas, and the effects of the project upon these resources. This assessment should insure that appropriate mitigation plans are identified and evaluated as to the projected time, cost, and impact effects. Mitigation IV this stage may be tentatively planned during the intensive field study.

Requirements

1. All of I and II

2. Comprehensive field examination (Sub-surface testing)

3. Collection of a reliable sample of the data

4. Description, evaluation, and characterization of resources

5. Planning for mitigation (cost, time and effects of impactment)

6. Recommendations to the Federal, State and City Registers of significant sites

Mitigation IV

A process for the amelioration of adverse impacts upon the cultural resources through the adoption of one of the various project alternatives. These alternatives most commonly include either avoidance (avoid an archaeological sensitive zone), relocation of the project, and protection and/or adequate data recovery of the significant resources.

Requirements

1. Requirements depend upon which alternative is chosen and its requisite research and methodology.

REPORTS OF PROCEDURES

Cultural resource management reports follow each phase of the project, in conjunction with steps #1 - 4 previously defined. These reports may be incorporated in the EIS. All reports must have the following:

Abstract

Management

Introduction and Description of Study

Effective Environment

Research Goals and Strategies

Methods of Data Collection and Analysis

References

Specifically, each phase of the project process contains the following:

Overview I

1. current knowledge of the nature, distribution and significance of cultural resources within study area

   summarize the information on culture history and process derived from records check and literature search

   discuss predictive statement on site density and distribution

   inadequacies in current knowledge

2. Culture Resource Options

   outline known and predicted impacts in the study area

   discuss potential in the study area for future archaeological research

   recommend research, preservation and protection priorities

   provide a listing of collections, field records and archives related to the archaeology of the study area and their location

provide a bibliography of the archaeological records and reports of the study area

provide a cost estimate for reconnaissance and/or intensive field study

Preliminary Reconnaissance II

1. detailed evaluation of project alternative with respect to archaeological resources

2. detailed evaluation of the significance of the resources (known or predicted to be present)

   analysis -

   a) describe and justify analytic techniques and activities

   b) describe classification of data recovered

   c) describe quantitative and qualitative manipulation of the data recovered for establishing cultural history and process

   d) summarize data

   e) evaluation of research - discuss reliability of data, deficiencies in records

   f) evaluation of cultural resources - provide predictions on distribution and density of resources

3. Recommendations for next stage of planning - Intensive Field Study

Intensive Field Study III

1. detailed description of previous field examinations and records research in specific impact area

2. identify degree of impact and alternatives to adverse impacts should be specified

3. inventory of archaeological resources (significance, density, nature)

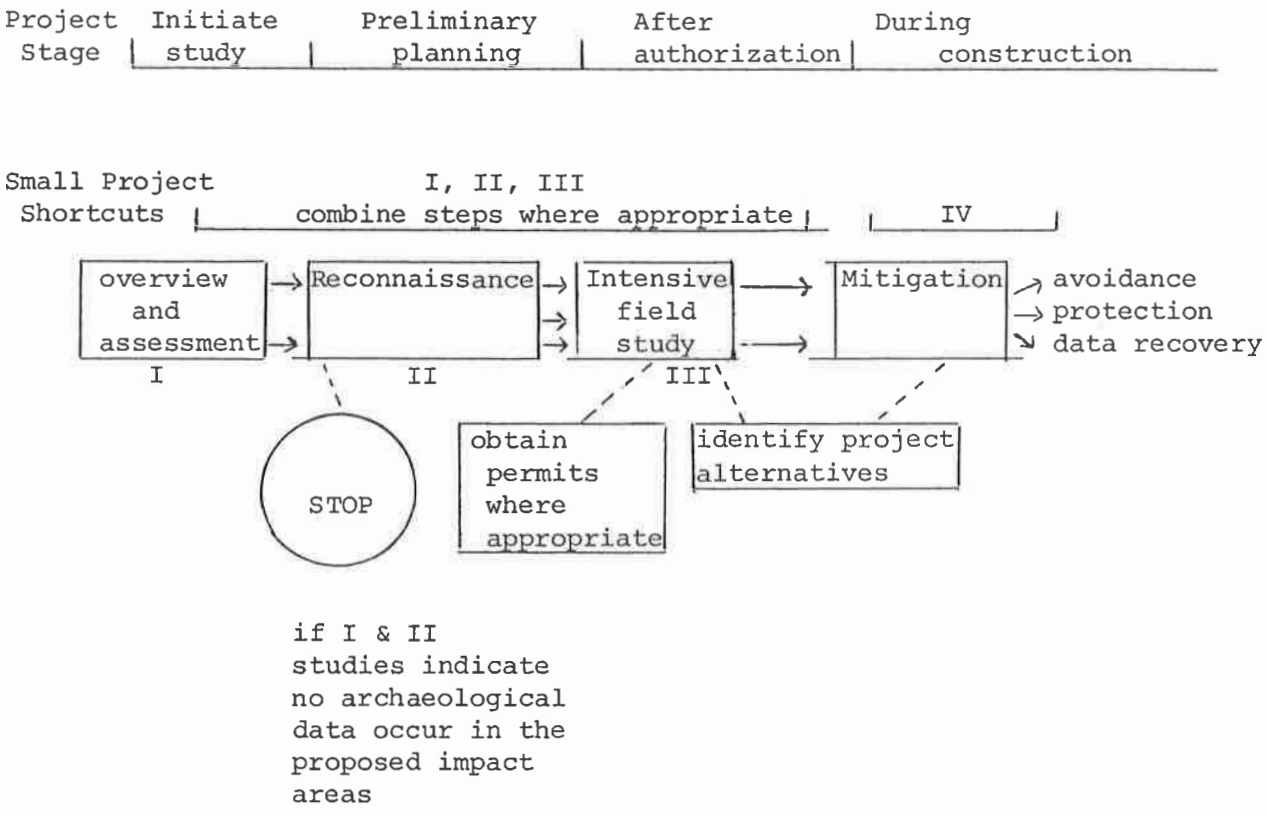
4. recommendations to Federal, State and City Registers

Mitigation IV

Report depends upon the final decision as to what alternative is chosen for amelioration of adverse impacts. If cultural resources will not be adversely impacted by the project as a result of project modification or

permanent cancellation of the project, then no further formal report may be necessary, although recommendations for future protection of cultural resources in the project area are appropriate.

NEPA process (general)



APPENDIX II

FEDERAL AND STATE LAWS

NEPA

The National Enviornmental Policy of 1969 is one of the most inclusive federal laws and it established a framework that can be used for all other major federal and state laws affecting archaeological resources (NEPA; NHPA 1966; EO11593; Dept. of Trans. Act; Texas Ant. Code; AHPA).

NEPA requires all referral agencies and federally assisted agencies to take into consideration and eveluate significant or major actions that will affect the environment.

In order to evaluate major federal actions a Council on Environmental Quality has been established (CEQ) and each sponsoring agency is required to submit an Environmental Impact Statement(EIS) concerning the effects of the impact upon cultural resources. Copies of the EIS should then be made available to the CEQ, the public, and should accompany the proposal through the review process.

If an action (impactment) has minimal impact on known archaeological resources, or if the impactment has been resolved (as determined by the CEQ, the archeologist and the agency), then an "archaeological clearance" will be granted by either the Regional Archaeologist or an archaeologist acceptable to NPS. In the case of no impact on archaeological resources, a "negative declaration" will be issued, stating that there are no significant cultural resources in the area to be impacted. If an action has major impact, then a complete re-evaluation of the action will be necessary and alternatives will be assessed.*

The determination of significance of cultural resources is critical to federal, state and local legislation. The National Register of Historic Places (as created by the Historic Preservation Act of 1966), has its own set of criteria, used in evaluating sites for placement on the National Register. These criteria include the scientific, social and educational qualities of the data base, as well as its degree of preservation and accessability.

These criteria, however, aren't inclusive; there is no "cookbook" method of determining National Register significance. Therefore, data which lies outside of them should not be excluded from Register consideration. In addition, it should be realized that sites which do not qualify for the National Register follows its original intent - to be a register of public-oriented sites, i.e., of sites that "speak" to the public. (A discussion of the Register follows).

* In summary, 3 different judgements exist under NEPA:

1. Archaeological clearance - there are resources but they are either not eligible for the National Register, or the proposed project will not disturb them.

2. Negative declaration - there are no resources.

3. Major impact - further evaluation and/or mitigation

REQUIREMENTS OF OTHER LAWS WHICH CAN BE APPLIED VIA NEPA

A-95

Each state has one agency which keeps abreast of major federal laws and informs state agencies of their legal responsibilities. All federal actions must be channeled through this agency. This "channelization" is termed "the A-95" process.

National Historic Preservation Act of 1966.

The purpose of this act is to expand and maintain a National Register of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, culture etc. An Advisory Council on Historic Preservation was established by this Act to advise the President and the Congress on matters relating to historic preservation.

This Council has procedures for compliance with NHPA and EO11593 (to be discussed):

If a federal agency finds that any undertaking will have an adverse affect on a property on or eligible for the National Register, the Advisory Council must be allowed to comment as required by Section 106 of the law.

NHPA provides for a program of matching grants in aid to states for surveys, planning, preservation, acquisition, restoration, and development projects.

EO 11593

This presidential order requires all federal agencies to take a "leadership" role in preservation and to nominate all eligible sites to the National Register. This law applies to all property under federal control or federally funded, licensed, or executed actions.

Department of Transportation Act

This act directs the Department of Transportation (DOT) to spend funds for protecting, avoiding or studying archaeological sites to be affected by federally funded road construction.

This law requires that alternatives to the proposed project be explored before a decision is made to use land from any archaeological site. Although a property bearing archaeological data may be deemed "ineligible" for the National Register, the site may still prove to be significant and worthy of Texas Antiquity status, or worthy of further archaeological investigation. For this reason alternative construction evaluations are important.

Texas Antiquities Code

Historical and prehistorical archaeological sites and objects (including sunken ships) are protected by this law which makes it a public policy to locate, protect and preserve them. An Antiquities Committee is in charge of these cultural resources and it may provide financial assistance for salvage operations. A permit or contract with the Committee is necessary before any kind of modification can occur (excavation or otherwise).

A marker (under auspices of the State Historical Commission) may signify an important archaeological site. Before any agency or person (public or private) removes or modifies such a marker, the modifying agency must consult with the State Historical Preservation Officer (SHPO) for permission to do so. (Only the marker itself is covered by this program.) However, it must be remembered that property or objects represented by a marker may prove to be significant and qualify for the National Register, Texas Antiquities status or the Historical Medallion Program. In addition, the other laws mentioned in this report apply.

An official Historical Medallion Program, also under the jurisdiction of the Texas State Historical Commission, applies to significant structures in the history of Texas. The medallion offers more protection than the marker: the Commission and the impacting agency must meet during a "60-day stay" period to discuss mitigative alternatives to the proposed project.

Archeological and Historical Preservation Act of 1974

This law amends the Reservoir Salvage Act of 1960 by specifically providing for the preservation of archaeological data which otherwise would be lost as a result of federal or federally-assisted projects.

Such an agency may either ask the Secretary of the Interior to undertake the necessary preservation of the data (recovery, protection, analysis and publication), or it may undertake such activities itself. In the case that the Secretary is asked to undertake preservation measures, the agency is still responsible for delegating a portion of its project construction funds (1%) for fulfillment of this law.

In summary, monetary responsibility for AHPA is as follows:

1) The agency may fund the archaeology entirely out of its own pocket

2) The agency may (must) transfer 1% of its project funds to the Secretary to assist him in archaeological preservation

APPENDIX III

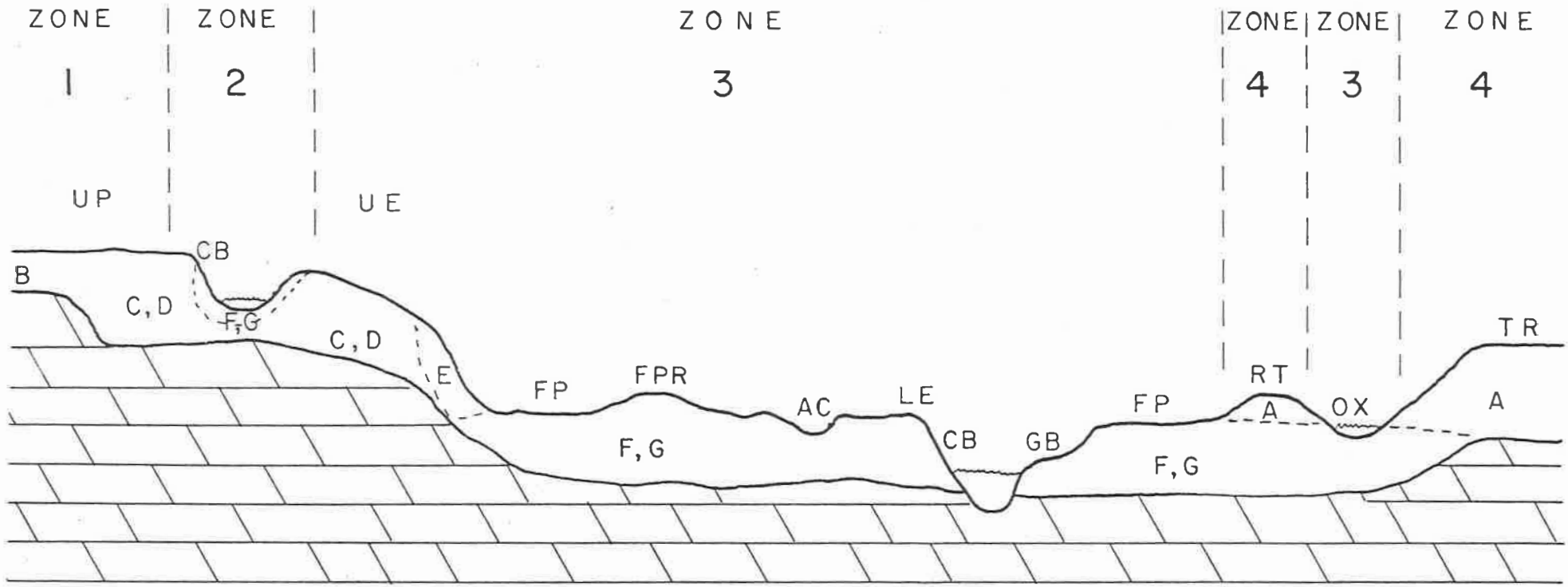
TEXAS ANTIQUITIES COMMITTEE
REQUIREMENTS FOR ARCHEOLOGISTS

Professional Personnel

Appropriately trained specialists required to perform an adequate archeological investigation. These personnel include:

(1) Principal Investigator - A professional archeologist or underwater archeologist with demonstrated competence in field archeology and laboratory analysis, as well as experience in administration, logistics, personnel deployment, report publication, and fiscal management. The Principal Investigator must have at least three months full-time experience in a supervisory role involving complete responsibility for a major portion of a project of comparable complexity to that which is to be undertaken under permit. The Principal Investigator must have demonstrated the ability to disseminate the results of archeological investigation in published form conforming to current professional standards. The Principal Investigator must remain on-site a minimum of 25% of the time required for the field investigation and must be a co-author of the project report. When not on-site, the Principal Investigator must provide a Field Archeologist to supervise the field investigation. In the event of controversy or court challenge, the Principal Investigator shall testify concerning report findings.

(2) Professional Archeologist - One who has 1) a graduate degree in archeology or anthropology with specialization in archeology from an accredited institution of higher education, or the equivalent as approved by the Antiquities Committee, 2) a minimum experience of two comprehensive archeological field seasons under competent supervision, and 3) published results of archeological investigations in scholarly journals; or one who is accredited by the Society of Professional Archeologists (SOPA) with emphasis in field Research.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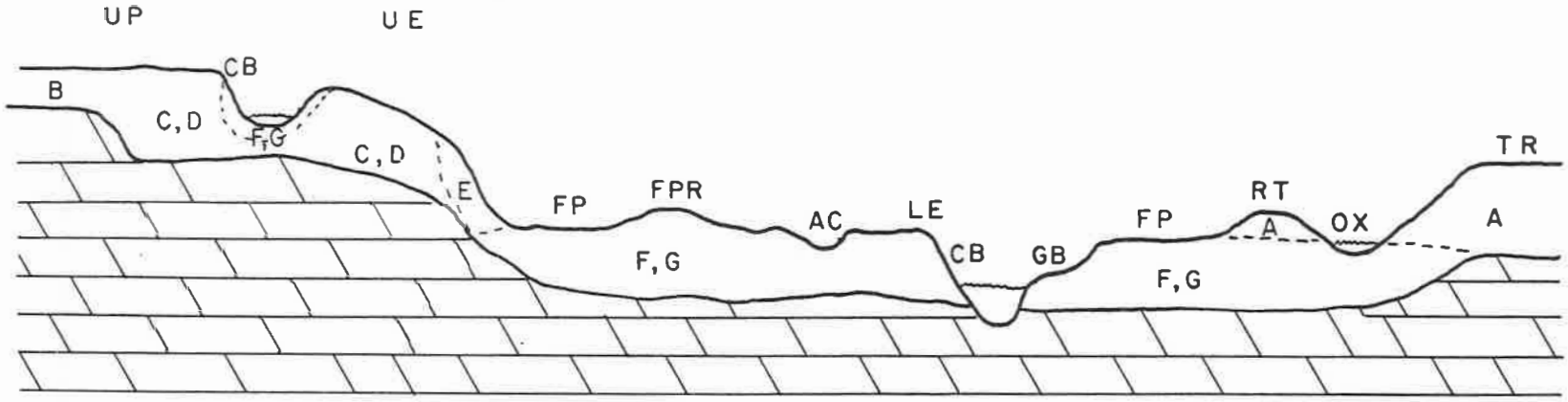
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